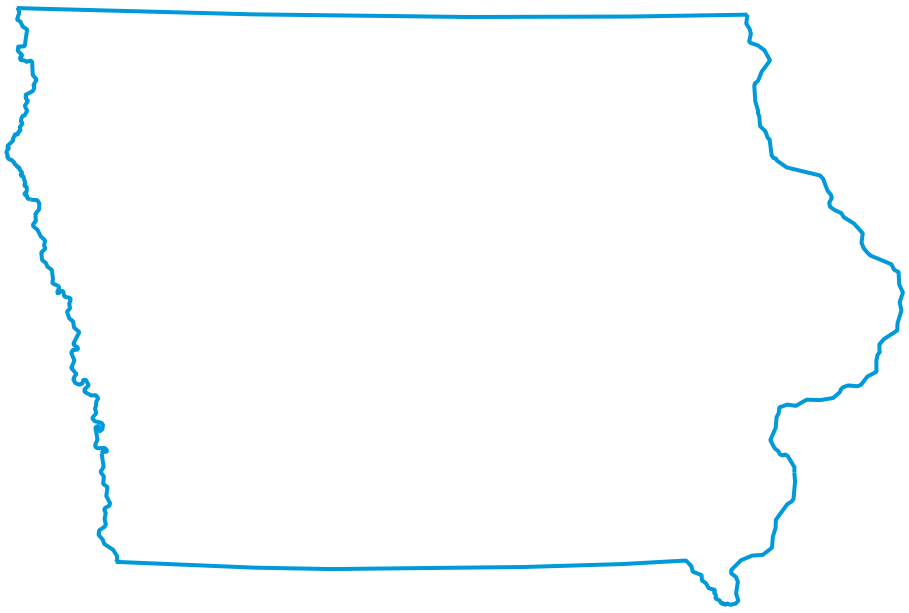
USGS
science for a changing world

Prepared in cooperation with the Iowa Department of Natural Resources–Geological Survey; Iowa Department of Transportation; and Federal agencies

Water Resources Data Iowa Water Year 2003

Volume 1
Surface Water and Precipitation



Water-Data Report IA-03-1

U.S. Department of the Interior
U.S. Geological Survey

CALENDAR FOR WATER YEAR 2003

2002

OCTOBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOVEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER

S	M	T	W	T	F	S
1	2	3	4	5	7	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

2003

JANUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

FEBRUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MAY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

AUGUST

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

SEPTEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Water Resources Data
Iowa
Water Year 2003

Volume 1. Surface Water and Precipitation

By Greg M. Nalley, Joseph G. Gorman, Robert D. Goodrich, and Von E. Miller

Water-Data Report IA-03-1

Prepared in cooperation with the Iowa Department of Natural Resources–Geological Survey; Iowa Department of Transportation; and Federal agencies

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
Gale A. Norton, Secretary

U.S. Geological Survey
Charles G. Groat, Director

U.S. Geological Survey
P.O. Box 1240
Iowa City, Iowa 52244
(319) 337-4191

Information about the USGS, Iowa District is available on the Internet at http://ia.water.usgs.gov/.

Information about all USGS reports and products is available by calling 1-888-ASK-USGS or on the Internet via the World Wide Web at http://www.usgs.gov/.

Additional earth science information is available by accessing the USGS home page at http://www.usgs.gov/.

Preface

This volume of the annual hydrologic data report of Iowa is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by local, State, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines.

Personnel in charge of the field units are:

Joseph G. Gorman, Western Field Unit

Robert D. Goodrich, Eastern Field Unit

The data were collected, computed and processed by the following personnel:

K.D. Becher	J.S. Hansen	J.A. Nason
J.F. Cerveny	J.W. Harms	M.J. Noon
D.E. Christiansen	K.S. Housel	S.A. Rundquist
D.T. Conell	R.L. Kopish	D.J. Schnoebelen
A.R. Conkling	S.M. Linhart	M.K. Segreto
A.L. Donnelly	G.R. Littin	P.K. Smith
D.A. Eash	J.C. McVay	J.R. Sondag
N.C. Elmendorf	J. J. Moline	S.R. Strader
E.E. Fischer	V.E. Miller	S.A. Thul
A. Grote	J.F. Nania	N.J. VanderZwan

This report was prepared in cooperation with the State of Iowa and with other agencies under the general supervision of Greg M. Nalley, Chief Hydrologic Surveillence Section, and Rob G. Middlemis-Brown, District Chief, Iowa.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	15 March 2004	Annual, 1 Oct. 2002 - 30 Sept. 2003

4. TITLE AND SUBTITLE
Water Resources Data, Iowa, Water Year 2003
Volume 1: Surface Water and Precipitation

5. FUNDING NUMBERS

6. AUTHOR(S)
G.M. Nalley, J.G. Gorman, R.D. Goodrich, and V.E. Miller

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Geological Survey, Water Resources Division
P.O. Box 1230
Iowa City, IA 52244

8. PERFORMING ORGANIZATION REPORT NUMBER
USGS-WRD-IA-03-1

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Geological Survey, Water Resources Division
P.O. Box 1230
Iowa City, IA 52244

10. SPONSORING / MONITORING AGENCY REPORT NUMBER
USGS-WRD-IA-03-1

11. SUPPLEMENTARY NOTES
Prepared in cooperation with the Iowa Department of Natural Resources–Geological Survey; Iowa Department of Transportation; and Federal agencies.

12a. DISTRIBUTION / AVAILABILITY STATEMENT
No restrictions on distribution. This report may be purchased from:

National Technical Information Service
Springfield, VA 22161

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*
Water resources data for Iowa for the 2003 water year consists of records of stage, discharge, and water quality of streams; stage, and/or contents of lakes and reservoirs; ground-water levels and water quality of ground-water wells. This report volume contains discharge records for 134 gaging stations; stage or contents for 9 lakes and reservoirs and 3 streams; water quality for 4 stream-gaging stations; sediment records for 11 stream-gaging stations; and precipitation record for 7 precipitation stations. Also included are data for 90 crest-stage partial-record stations.

14. SUBJECT TERMS
*Iowa, *Hydrologic data, *Surface water, *Water quality, Flow rates, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediment, Water temperatures, Sampling sites, Water levels, Water analyses, Data collection.

15. NUMBER OF PAGES
473

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	

Contents

Preface iii
Contents v
Figures vi
Tables vi
Surface-Water Stations, in Downstream Order, for which Records are Published in this Volume vii
Discontinued surface-water discharge or stage-only stations xi
Discontinued surface-water-quality stations xiv
Introduction 1
Cooperation 1
Summary of Hydrologic Conditions 2
Precipitation 2
Surface water 3
Streamflow 3
Suspended Sediment 3
Water Quality 6
Downstream Order and Station Number 7
Special Networks and Programs 8
Explanation of Stage- and Water Discharge Records 9
Data Collection and Computation 9
Data Presentation 9
Station Manuscript 10
Peak Discharge Greater than Base Discharge 10
Data Table of Daily Mean Values 10
Statistics of Monthly Mean Data 11
Summary Statistics 11
Identifying Estimated Daily Discharge 12
Accuracy of Field Data and Computed Results 12
Other Data Records Available 12
Explanation of Precipitation Records 12
Data Collection and Computation 12
Data Presentation 13
Explanation of Water-Quality Records 13
Collection and Examination of Data 13
Water Analysis 13
Surface-Water-Quality Records 13
Classification of Records 13
Accuracy of the Records 14
Arrangement of Records 14
On-Site Measurements and Sample Collection 14
Water Temperature 14
Sediment 14
Laboratory Measurements 15
Data Presentation 15
Remark Codes 15
Water-Quality Control Data 16
Blank Samples 16
Reference Samples 16
Replicate Samples 16
Spike Samples 17
Access to USGS Water Data 17
Definition of Terms 17
Techniques of Water-Resources Investigations of the U.S. Geological Survey 31
Gaging stations, surface water 35
Crest-stage partial-record stations 456
Index 467

Figures

Figure 1. Water year 2003 precipitation record for the National Weather Service's designated Climatological Districts 3
2. Annual runoff for period of record at index stations. 4
3. Location of continuous-record and crest-stage gaging stations in Iowa, water year 2003. 5
4. Location of active sediment and surface-water quality stations in Iowa, water year 2003. 6
5. Annual sediment discharge statistics at four long-term streamflow-gaging stations, water year 2003. 7
6–20. Maps showing locations of active continuous-record and crest-stage gaging stations
6. Mississippi River drainage basin, (northeast Iowa). 36
7. Turkey River and Maquoketa River drainage basins. 64
8. Mississippi River, Wapsipinicon River, and Crow Creek drainage basins. 86
9. Iowa River drainage basins (excluding the Cedar River drainage basin). 118
10. Cedar River drainage basins. 170
11. Skunk River drainage basins. 214
12. Upper Des Moines River drainage basin. 254
13. Raccoon River drainage basins. 280
14. Lower Des Moines River and Fox River drainage basins. 306
15. Big Sioux River drainage basin. 358
16. Missouri River, Perry Creek, Floyd River, and Monona-Harrison Ditch drainage basins. 366
17. Little Sioux River and Soldier River drainage basins. 382
18. Boyer River and Missouri River Main Stem drainage basins. 400
19. Nishnabotna River, Nodaway River, and Missouri River Main Stem drainage basins. 424
20. Platte River, Grand River, and Chariton River drainage basins. 440

Tables

Table 1. Monthly and annual precipitation during the 2003 water year as a percentage of normal precipitation 2

Surface-Water Stations, in Downstream Order, for which Records are Published in this Volume

[Letter after station name designates types of data: (d) discharge, (c) chemical, (p) precipitation, (s) sediment, (t) temperature, (e) elevations, gage heights, or contents]

UPPER MISSISSIPPI RIVER BASIN
Mississippi River:
Upper Iowa River at Bluffton (d) . . . 05387440 . . . 38
Upper Iowa River at Decorah (d) . . . 05387500 . . . 40
Upper Iowa River near Dorchester (d) . . . 05388250 . . . 42
Bloody Run Creek near Marquette (dtsp) . . . 05389400 . . . 44
Mississippi River at McGregor (dts) . . . 05389500 . . . 54
Mississippi River at Clayton (d) . . . 05411500 . . . 62
TURKEY RIVER BASIN
Turkey River near Eldorado (d) . . . 05411850 . . . 66
Turkey River above French Hollow Creek at Elkader (d) . . . 05412020 . . . 68
Volga River at Littleport (d) . . . 05412400 . . . 70
Turkey River at Garber (d) . . . 05412500 . . . 72
MAQUOKETA RIVER BASIN
Maquoketa River at Manchester (d) . . . 05416900 . . . 74
North Fork Maquoketa River near Fulton (d) . . . 05418400 . . . 76
Maquoketa River near Maquoketa (d) . . . 05418500 . . . 78
Mississippi River:
Beaver Slough at Third Street Clinton (d) . . . 05420460 . . . 88
Mississippi River at Clinton (dcts) . . . 05420500 . . . 90
WAPSIPINICON RIVER BASIN
Wapsipinicon River near Tripoli (dp) . . . 05420680 . . . 98
Wapsipinicon River at Independence (d) . . . 05421000 . . . 106
Wapsipinicon River at Anamosa (d) . . . 05421740 . . . 108
Wapsipinicon River near De Witt (d) . . . 05422000 . . . 110
Mississippi River:
Crow Creek at Bettendorf (d) . . . 05422470 . . . 112
Duck Creek at 110th Avenue, Davenport (d) . . . 05422560 . . . 114
Duck Creek at Duck Creek Golf Course (d) . . . 05422600 . . . 116
IOWA RIVER BASIN
Iowa River near Rowan (d) . . . 05449500 . . . 120
South Fork Iowa River Northeast of New Providence (dp) . . . 05451210 . . . 126
Iowa River at Marshalltown (d) . . . 05451500 . . . 134
Timber Creek near Marshalltown (d) . . . 05451700 . . . 136
Richland Creek near Haven (d) . . . 05451900 . . . 138
Salt Creek near Elberon (d) . . . 05452000 . . . 140
Walnut Creek near Hartwick (d) . . . 05452200 . . . 142
Big Bear Creek at Ladora (d) . . . 05453000 . . . 144
Iowa River at Marengo (d) . . . 05453100 . . . 146
Coralville Lake near Coralville (e) . . . 05453510 . . . 148
Iowa River below Coralville Dam near Coralville (d) . . . 05453520 . . . 150
Rapid Creek below Morse (p) . . . 05453600 . . . 152
Rapid Creek near Iowa City (d) . . . 05454000 . . . 154
Clear Creek near Oxford (d) . . . 05454220 . . . 156
Clear Creek near Coralville (d) . . . 05454300 . . . 158
Iowa River at Iowa City (d) . . . 05454500 . . . 160
South Branch Ralston Creek at Iowa City (e) . . . 05455010 . . . 162
Old Mans Creek near Iowa City (d) . . . 05455100 . . . 164
English River at Kalona (d) . . . 05455500 . . . 166
Iowa River near Lone Tree (d) . . . 05455700 . . . 168

UPPER MISSISSIPPI RIVER BASIN—Continued
CEDAR RIVER BASIN
Cedar River at Charles City (d) . . . 05457700 . . . 172
Little Cedar River near Ionia (d) . . . 05458000 . . . 174
Cedar River at Waverly (d) . . . 05458300 . . . 176
Cedar River at Janesville (d) . . . 05458500 . . . 178
West Fork Cedar River at Finchford (d) . . . 05458900 . . . 180
Shell Rock River:
Winnebago River at Mason City (d) . . . 05459500 . . . 182
Willow Creek:Clear Creek:
Clear Lake at Clear Lake (e) . . . 05460000 . . . 184
Shell Rock River at Shell Rock (d) . . . 05462000 . . . 186
Beaver Creek at New Hartford (d) . . . 05463000 . . . 188
Cedar River at Cedar Falls (d) . . . 05463050 . . . 190
Black Hawk Creek at Hudson (d) . . . 05463500 . . . 192
Cedar River at Waterloo (d) . . . 05464000 . . . 194
Wolf Creek near Dysart (dp) . . . 05464220 . . . 196
Cedar River at Cedar Rapids (d) . . . 05464500 . . . 198
Hoover Creek at West Branch (d) . . . 05464942 . . . 200
Cedar River near Conesville (d) . . . 05465000 . . . 202
Iowa River at Wapello (dts) . . . 05465500 . . . 204
SKUNK RIVER BASIN
Skunk River:
South Skunk River near Ames (d) . . . 05470000 . . . 216
Squaw Creek at Ames (d) . . . 05470500 . . . 218
South Skunk River below Squaw Creek near Ames (d) . . . 05471000 . . . 220
Squaw Creek near Colfax (dtsp) . . . 05471040 . . . 222
South Skunk River at Colfax (d) . . . 05471050 . . . 232
Indian Creek near Mingo (d) . . . 05471200 . . . 234
South Skunk River near Oskaloosa (d) . . . 05471500 . . . 236
North Skunk River near Sigourney (d) . . . 05472500 . . . 238
Cedar Creek near Oakland Mills (d) . . . 05473400 . . . 240
Big Creek near Mt. Pleasant (d) . . . 05473450 . . . 242
Skunk River at Augusta (dts) . . . 05474000 . . . 244
Mississippi River at Keokuk (d) . . . 05474500 . . . 252
DES MOINES RIVER BASIN
Des Moines River at Humboldt (d) . . . 05476750 . . . 256
East Fork Des Moines River at Dakota City (d) . . . 05479000 . . . 258
Des Moines River at Fort Dodge (d) . . . 05480500 . . . 260
Boone River near Webster City (d) . . . 05481000 . . . 262
Des Moines River near Stratford (d) . . . 05481300 . . . 264
Saylorville Lake near Saylorville (e) . . . 05481630 . . . 266
Des Moines River near Saylorville (dts) . . . 05481650 . . . 268
Beaver Creek near Grimes (d) . . . 05481950 . . . 276
Des Moines River at Second Avenue at Des Moines (d) . . . 05482000 . . . 278
RACCOON RIVER BASIN
Raccoon River:
South Raccoon River:
North Raccoon River near Sac City (d) . . . 05482300 . . . 282
Black Hawk Lake at Lake View (e) . . . 05482315 . . . 284
North Raccoon River near Jefferson (d) . . . 05482500 . . . 286
Middle Raccoon River near Bayard (d) . . . 05483450 . . . 288
Lake Panorama at Panora (e) . . . 05483470 . . . 290
Middle Raccoon River at Panora (d) . . . 05483600 . . . 292
South Raccoon River at Redfield (d) . . . 05484000 . . . 294
Raccoon River at Van Meter (d) . . . 05484500 . . . 296

UPPER MISSISSIPPI RIVER BASIN—Continued
Raccoon River near West Des Moines (d) 05484600 298
Raccoon River at 63rd Street Des Moines (d) 05484650 300
Walnut Creek at Des Moines (d) 05484800 302
Raccoon River at Fleur Drive Des Moines (d) 05484900 304
Des Moines River below Raccoon River at Des Moines (d) 05485500 308
Fourmile Creek at Des Moines (d) 05485640 310
North River near Norwalk (d) 05486000 312
Middle River near Indianola (d) 05486490 314
South River near Ackworth (d) 05487470 316
Des Moines River near Runnells (d) 05487500 318
Walnut Creek near Prairie City (dtsp) 05487540 320
Walnut Creek near Vandalia (d) 05487550 330
White Breast Creek near Dallas (d) 05487980 340
Lake Red Rock near Pella (d) 05488100 342
Des Moines River near Pella (d) 05488110 344
English Creek near Knoxville (d) 05488200 346
Des Moines River near Tracy (d) 05488500 348
Cedar Creek near Bussey (d) 05489000 350
Des Moines River at Ottumwa (d) 05489500 352
Des Moines River at Keosauqua (d) 05490500 354
Fox River at Bloomfield (d) 05494300 356

MISSOURI RIVER BASIN
Missouri River:
BIG SIOUX RIVER BASIN
Big Sioux River:
Rock River below Tom Creek at Rock Rapids (d) 06483290 360
Rock River near Rock Valley (d) 06483500 362
Big Sioux River at Akron, IA (d,c,s) 06485500 364
Missouri River at Sioux City (d) 06486000 368
PERRY CREEK BASIN
Perry Creek at 38th Street, Sioux City (d) 06600000 370
FLOYD RIVER BASIN
Floyd River at Alton (d) 06600100 372
Floyd River at James (d) 06600500 374
Missouri River at Decatur (d) 06601200 376
MONONA-HARRISON DITCH BASIN
West Fork Ditch at Hornick (d) 06602020 378
Monona-Harrison Ditch near Turin (d) 06602400 380
LITTLE SIOUX RIVER BASIN
Little Sioux River:
Milford Creek:
Spirit Lake near Orleans (e) 06604000 384
West Okoboji Lake at Lakeside Laboratory near Milford (e) 06604200 386
Ocheyedan River near Spencer (d) 06605000 388
Little Sioux River at Linn Grove (d) 06605850 390
Little Sioux River at Correctionville (d) 06606600 392
Maple River at Mapleton (d) 06607200 394
Little Sioux River near Turin (d) 06607500 396
SOLDIER RIVER BASIN
Soldier River at Pisgah (d) 06608500 398
BOYER RIVER BASIN
Boyer River at Logan (d) 06609500 402
Missouri River at Omaha (dcts) 06610000 404
Missouri River at Nebraska City (dts) 06807000 416

MISSOURI RIVER BASIN—Continued
NISHNABOTNA RIVER BASIN
West Nishnabotna River at Hancock (d) 06807410 426
West Nishnabotna River at Randolph (d) 06808500 428
East Nishnabotna River near Atlantic (d) 06809210 430
East Nishnabotna River at Red Oak (d) 06809500 432
Nishnabotna River above Hamburg (d) 06810000 434
Missouri River at Rulo (d) 06813500 436
NODAWAY RIVER BASIN
Nodaway River:
Nodaway River at Clarinda (d) 06817000 438
PLATTE RIVER BASIN
Platte River:
One Hundred and Two River:
East Fork One Hundred and Two River at Bedford (d) 06819185 442
GRAND RIVER BASIN
Grand River:
Thompson River at Davis City (d) 06898000 444
CHARITON RIVER BASIN
Chariton River near Chariton (d) 06903400 446
South Fork Chariton River near Promise City (d) 06903700 448
Rathbun Lake near Rathbun (d) 06903880 450
Chariton River near Rathbun (d) 06903900 452
Chariton River near Moulton (d) 06904010 454

Discontinued surface-water discharge or stage-only stations

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in Iowa have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

Discontinued surface-water discharge or stage-only stations

[(d), discharge station; (e), elevation (stage only) station; *, currently operated as crest-stage partial-record station]

Station name	Station number	Drainage area (mi^2)	Period of record
Upper Iowa River near Decorah, Ia. (d)	05388000	568	1913-14; 1919-27, 1933-51
Paint Creek at Waterville, Ia. (d)	05388500	42.8	1952-73
Yellow River at Ion, Ia. (d)	05389000	221	1934-51
Sny Magill Creek near Clayton, Ia. (d)	05411400	27.6	1992-01
Turkey River at Spillville, Ia. (d)	05411600	177	1957-73; 1978-91
Big Springs near Elkader, Ia. (d)	05411950	103	1938; 1982-83; 1988-95
Turkey River at Elkader, Ia. (d)	05412000	891	1932-42
Unnamed Creek near Luana, Ia. (d)	05412056	1.15	1986-92
Silver Creek near Luana, Ia (d)	05412060	4.39	1986-98
Roberts Creek at St. Olaf, Ia. (d)	05412100	70.7	1986-01
Little Maquoketa River near Durango, Ia. (d)	05414500	130	1934-82
Maquoketa River near Manchester, Ia. (d)	05417000	305	1933-73
Maquoketa River near Delhi, Ia. (d)	05417500	347	1933-40
Bear Creek near Monmouth, Ia. (d)	05417700	61.3	1957-76
Maquoketa River above North Fork Maquoketa River near Maquoketa, Ia. (d)	05418000	938	1913-14
North Fork Maquoketa River at Fulton, Ia. (d)	05418450	516	1977-91
Elk River near Almont, Ia. (d)	05420300	55.9	1995-97
Wapsipinicon River near Elma, Ia. (d)	05420560	95.2	1958-92
Wapsipinicon River at Stone City, Ia. (d)	05421500	1,324	1903-14
Crow Creek at Eldridge, Ia. (d)	05422420	2.20	1977-82
Crow Creek at Mt. Joy, Ia. (d)	05422450	6.90	1977-82
Pine Creek near Muscatine, Ia. (d)	05448150	38.9	1975-82
Eagle Lake Inlet near Britt, Ia. (e)	05448285	3.83	1975-80
Eagle Lake Outlet near Britt, Ia. (e)	05448290	11.3	1975-80
West Branch (West Fork) Iowa River near Klemme, Ia. (d)	05448500	112	1948-58
East Branch (East Fork) Iowa River near Klemme, Ia. (d)	05449000	133	1948-76; 1977-95
Iowa River near Iowa Falls, Ia. (d)	05450000	665	1911-14
Upper Pine Lake at Eldora, Ia. (e)	05450500	14.9	1936-70
Lower Pine Lake at Eldora, Ia. (e)	05451000	15.9	1936-70
Iowa River near Belle Plaine, Ia. (d)	05452500	2,455	1939-59
Lake Macbride near Solon, Ia. (e)	05453500	27.0	1937-71
Ralston Creek at Iowa City, Ia. (d)	05455000	3.01	1924-87
Cedar River at Mitchell, Ia. (d)	05457500	826	1933-42
Shell Rock River near Northwood, Ia. (d)	05459000	300	1945-86
Shell Rock River at Marble Rock, Ia. (d)	05460500	1,318	1933-53
Shell Rock River at Greene, Ia. (d)	05461000	1,357	1933-42
Flood Creek near Powersville, Ia (d)	05461390	127	1996-98
Shell Rock River near Clarksville, Ia. (d)	05461500	1,626	1915-27; 1932-34
Fourmile Creek near Lincoln, Ia. (d)	05464130	13.8	1962-67; 1969-74; 1976-80
Half Mile Creek near Gladbrook, Ia. (d)	05464133	1.33	1962-67; 1969-74; 1976-80
Fourmile Creek near Traer, Ia. (d)	05464137	19.5	1962-74; 1975-80
Prairie Creek at Fairfax, Ia. (d)	05464640	178	1966-82
Lake Keomah near Oskaloosa, Ia. (e)	05472000	3.06	1936-71

Discontinued surface-water discharge or stage-only stations—Continued

[(d), discharge station; (e), elevation (stage only) station; *, currently operated as crest-stage partial-record station]

Station name	Station number	Drainage area (mi^2)	Period of record
Skunk River at Coppock, Ia. (d)	05473000	2,916	1913-44
Big Creek near Mount Pleasant, Ia. (d)	05473500	106	1955-79
Des Moines River at Estherville (d)	05476500*	1,372	1951-95
East Fork Des Moines River near Burt, Ia. (d)	05478000	462	1951-74
Des Moines River near Fort Dodge, Ia. (d)	05479500	3,753	1911-13
Lizard Creek near Clare, Ia. (d)	05480000	257	1940-82
Des Moines River near Boone, Ia. (d)	05481500	5,511	1920-68
North Raccoon River near Newell, Ia. (d)	05482135*	233	1982-95
Storm Lake at Storm Lake, Ia. (e)	05482140	28.3	1970-75
Big Cedar Creek near Varina, Ia. (d)	05482170	80.0	1960-91
East Fork Hardin Creek near Churdan, Ia. (d)	05483000	24.0	1953-91
Hazelbrush Creek near Maple River, Ia. (d)	05483343	9.22	1990-94
Springbrook Lake near Guthrie Center, Ia. (e)	05483460	5.18	1936-71
Raccoon River at Des Moines, Ia. (e)	05485000	3,628	1902-03
Lake Ahquabi near Indianola, Ia. (e)	05487000	4.93	1936-71
White Breast Creek near Knoxville, Ia. (d)	05488000	380	1945-62
South Coal Creek near Bussey, Ia. (d)	05489090	12.9	1977-81
Muchakinock Creek near Eddyville, Ia (d)	05489190	70.2	1975-79
Lake Wapello near Drakesville, Ia. (e)	05490000	7.75	1936-71
Sugar Creek near Keokuk, Ia. (d)	05491000	105	1922-31; 1958-73
Fox River at Cantril, Ia. (d)	05494500	161	1940-51
Rock River at Rock Rapids, Ia. (d)	06483270	788	1959-74
Dry Creek at Hawarden, Ia. (d)	06484000	48.4	1948-69
West Branch Floyd River near Struble, Ia. (d)	06600300*	108	1955-95
Monona-Harrison Ditch near Blencoe, IA (d)	06602410	4,440	1939-42
Loon Creek near Orleans, Ia. (d)	06603920	31.0	1971-74
Spirit Lake Outlet at Orleans, Ia. (e)	06604100	75.6	1971-74
Milford Creek at Milford, Ia. (d)	06604400	146	1971-74
Little Sioux River at Spencer, Ia. (d)	06605100	990	1936-42
Little Sioux River at Gillett Grove, Ia. (d)	06605600	1,334	1958-73
Little Sioux River near Kennebeck, Ia. (d)	06606700	2,738	1939-69
Odebolt Creek near Arthur, Ia. (d)	06607000	39.3	1957-75
Maple River at Turin, Ia. (d)	06607300	725	1939-41
Little Sioux River near Blencoe, Ia. (d)	06607510	4,440	1939-42
Steer Creek near Magnolia, Ia. (d)	06609200	9.26	1963-69
Thompson Creek near Woodbine, Ia. (d)	06609590	6.97	1963-69
Willow Creek near Logan, Ia. (d)	06609600	129	1972-75
Indian Creek at Council Bluffs, Ia. (d)	06610500	6.92	1954-76
Mosquito Creek near Earling, Ia. (d)	06610520	32.0	1965-79
Waubonsie Creek near Bartlett, Ia. (d)	06806000	30.4	1946-69
West Nishnabotna River at Harlan, Ia. (d)	06807320	316	1977-82
West Nishnabotna River at (near) White Cloud, Ia. (d)	06807500	967	1918-24
Mule Creek near Malvern, Ia. (d)	06808000	10.6	1954-69
Spring Valley Creek near Tabor, Ia. (d)	06808200	7.6	1955-64
Davids Creek near Hamlin, Ia. (d)	06809000	26.0	1952-73
Tarkio River at Stanton, Ia. (d)	06811840*	49.3	1958-91
Tarkio River at Blanchard, Ia. (d)	06812000	200	1934-40
West Nodaway River at Villisca, Ia. (d)	06816500	342	1918-25
Platte River near Diagonal, Ia. (d)	06818750*	217	1969-91
East Fork One Hundred and Two River near Bedford, Ia. (d)	06819190	92.1	1959-83

Discontinued surface-water discharge or stage-only stations—Continued

[(d), discharge station; (e), elevation (stage only) station; *, currently operated as crest-stage partial-record station]

Station name	Station number	Drainage area (mi^2)	Period of record
Elk River near Decatur City, Ia. (d)	06897950*	52.5	1968-94
Weldon River near Leon, Ia. (d)	06898400	104	1959-91
Honey Creek near Russell, Ia. (d)	06903500	13.2	1952-62
Chariton River near Centerville, Ia. (d)	06904000	708	1938-59

Discontinued surface-water-quality stations

The following water-quality stations have been discontinued in Iowa. Continuous daily records of water temperature, specific conductance, or sediment and monthly or periodic samples of chemical quality or biological data were collected and published for the period of record shown for each station.

Discontinued surface-water-quality stations

[Type of record: Chem.–chemical quality, Cond.–specific conductance, Temp.–water temperature, Sed.–sediment, Bio.–biological; *, periodic data available subsequent to period of daily record]

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
Upper Iowa River at Decorah, Ia.	05387500	511	Sed. Temp.	1963-68 1963-83
Upper Iowa River near Dorchester, Ia.	05388250	770	Sed., Temp.*, Cond.*	1975-81
Paint Creek at Waterville, Ia.	05388500	42.8	Temp. Sed.	1952-56 1952-57
Unnamed Creek near Luana	05412056	1.15	Chem.	1986-92
Sny Magill Creek near Clayton, Ia.	05411400	27.6	Sed., Temp., Cond.	1992-01
Turkey River at Garber, Ia.	05412500	1,545	Temp.*, Sed.*	1957-62
Mississippi River at Dubuque, Ia.	05414700	81,600	Chem.	1969-73
Maquoketa River at Manchester, Ia	05416900	275	Sed., Temp., Cond.	2000-02
Elk River near Almont, Ia	05420300	55.9	Sed., Temp., Cond.	1995-97
Mississippi River at Clinton, Ia	05420500	85,600	Sed.	1995-97
Wapsipinicon River near Tripoli, Ia	05420860	343	Chem.	1996-98
Wapsipinicon River at Independence, Ia.	05421000	1,048	Cond.* Temp.*, Sed.*	1968-70 1967-70
Crow Creek at Bettendorf, Ia.	05422470	17.8	Cond.*, Temp.*, Sed.	1978-82
Iowa River near Rowan, Ia.	05449500	429	Temp.*, Sed.* Chem.	1957-62 1996-98
Iowa River at Marshalltown, Ia	05451500	1,532	Temp., Sed.	1988-95
Iowa River at Iowa City, Ia.	05454500	3,271	Chem.. Temp.*, Sed. Cond.	1906-07; 1944-54 1944-87 1968-87
Ralston Creek at Iowa City, Ia.	05455000	3.01	Cond Sed. Temp.	1968-87 1952-87 1967-87
Flood Creek near Powersville, Ia	05461390	127	Chem.	1996-98
Shell Rock River at Shell Rock, Ia.	05462000	1,746	Temp.*	1953-68
Cedar River at Cedar Falls, Ia	05463050	4,734	Chem.	1975-79; 1984; 1986-1995
Cedar River near (at) Gilbertville, Ia.	05464020	5,234	Chem.	1971; 1975-81
Fourmile Creek near Lincoln, Ia.	05464130	13.78	Chem., Temp., Sed.	1969-74
Half Mile Creek near Gladbrook, Ia.	05464133	1.33	Chem., Temp., Sed.	1969-74
Fourmile Creek near Traer, Ia.	05464137	19.51	Chem., Temp., Sed.	1969-74
Wolf Creek near Dysart, Ia	05464220	299	Chem.	1996-98
Cedar River near Palo, Ia.	05464450	6,380	Chem.	1975-79
Cedar River at Cedar Rapids, Ia.	05464500	6,510	Chem.* Temp.* Sed.	1906-07; 1944-54 1944-54 1943-54
Cedar River near Bertram, Ia.	05464760	6,955	Chem.	1975-81
Iowa River at Wapello, Ia	05465500	12, 499	Chem.	1977-95
Mississippi River at Burlington, Ia.	05469720	114,000	Chem.	1969-73
South Skunk River at Colfax, Ia	05471050	803	Cond.*, Temp.*, Sed.	1989-93
Skunk River at Augusta, Ia	05474000	4,303	Chem.	1977-95
Mississippi River at Keokuk, Ia.	05474500	119,000	Chem.	1974-87
Des Moines River at Fort Dodge, Ia.	05480500	4,190	Chem.	1972-73

Discontinued surface-water-quality stations—Continued

[Type of record: Chem.–chemical quality, Cond.–specific conductance, Temp.–water temperature, Sed.–sediment, Bio.–biological; *, periodic data available subsequent to period of daily record]

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
Des Moines River at 2nd Avenue at Des Moines, Ia.	05482000	6,245	Chem. Temp.*, Sed.	1954-55 1954-61
East Fork Hardin Creek near Churdan, Ia.	05483000	24.0	Temp.*, Sed.*	1952-57
Hazelbrush Creek near Maple River, Ia	05483343	9.22	Cond., Temp., Sed.	1991-94
Middle Raccoon River near Bayard, Ia.	05483450	375	Cond.*, Temp.*, Sed.	1979-85
Middle Raccoon River at Panora, Ia.	05483600	440	Cond.*, Temp.*, Sed.	1979-85
Raccoon River at Van Meter, Ia	05484500	3,441	Chem. Bio.	1974-79; 1986-94 1974-79
Raccoon River at Des Moines, Ia.	05485000	3,590	Chem., Temp.	1945-47
Des Moines River below Raccoon River at Des Moines, Ia.	05485500	9,879	Chem.* Temp.*, Sed.	1944-45 1944-47
Des Moines River below Des Moines, Ia.	05485520	9,901	Chem.	1971; 1974-81
Middle River near Indianola, Ia.	05486490	503	Temp.*, Sed.	1962-67
White Breast Creek near Dallas, Ia.	05487980	342	Chem. Temp.*, Sed.	1969-73 1967-73
Big Sioux River at Sioux City, Ia.	06485950	9,410	Chem.	1969-73
Missouri River at Sioux City, Ia.	06486000	314,600	Chem.	1972-86
			Sed.	1972-76; 1977-81; 1991-00
Floyd River at James, Ia.	06600500	886	Temp.*, Sed., Cond.*	1968-73
Floyd River at Sioux City, Ia.	06600520	921	Chem.	1969-73
Missouri River at Decatur, Neb.	06601200	316,160	Chem.	1974-81
Spirit Lake near Orleans, Ia.	06604000	75.6	Temp.	1968-75
Little Sioux River at Correctionville, Ia.	06606600	2,500	Chem.* Temp.* Sed.	1954-55 1951-62 1950-62
Little Sioux River near Kennebec, Ia.	06606700	2,738	Temp. Sed.	1951-55 1950-57
Little Sioux River at River Sioux, Ia.	06607513	3,600	Chem.	1969-73
Soldier River near Mondamin, Ia.	06608505	440	Chem.	1970-73
Steer Creek near Magnolia, Ia.	06609200	9.26	Temp., Sed., Cond.	1963-69
Thompson Creek near Woodbine, Ia.	06609590	6.97	Temp., Sed., Cond.	1963-69
Willow Creek near Logan, Ia.	06609600	129	Cond., Temp. Sed.	1972-75 1971-75
Missouri River at Omaha, Nebr.	06610000	322,800	Cond.*	1969-86
Mule Creek near Malvern, Ia.	06808000	10.6	Temp. Sed.	1958-69 1954-69
Davids Creek near Hamlin, Ia.	06809000	26.0	Temp.* Sed.	1952-53; 1965-68 1952-68
East Nishnabotna River at Red Oak, Ia.	06809500	894	Temp.*, Sed., Cond.*	1962-73
Nishnabotna River above Hamburg, Ia.	06810000	2,806	Chem. Temp.*, Cond. Bio.	1979-93 1979-81 1979-81
Nodaway River at Clarinda	06817000	762	Cond.*, Temp.*, Sed.	1976-92
Platte River near Diagonal, Ia.	06818750	217	Chem.	1969-73
Elk Creek near Decatur City, Ia.	06897950	52.5	Bio. Chem.	1970-72 1968-94
Thompson River at Davis City, Ia.	06898000	701	Chem. Temp.*, Sed., Cond.*	1967-73 1968-73
Weldon River near Leon, Ia.	06898400	104	Chem.	1968-73
Chariton River near Chariton, Ia.	06903400	182	Temp.*, Sed., Cond.*	1969-73

Discontinued surface-water-quality stations—Continued

[Type of record: Chem.–chemical quality, Cond.–specific conductance, Temp.–water temperature, Sed.–sediment, Bio.–biological; *, periodic data available subsequent to period of daily record]

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
Honey Creek near Russell, Ia.	06903500	13.2	Sed.	1952-62
Chariton River near Rathbun, Ia.	06903900	549	Temp.*, Sed.*, Cond.*	1962-69

Water Resources Data, Iowa, Water Year 2003

Volume 1—Surface Water and Precipitation

By Greg M. Nalley, Joseph G. Gorman, Robert D. Goodrich, and Von E. Miller

Introduction

The Water Resources Discipline of the U.S. Geological Survey, in cooperation with State, county, municipal, and other Federal agencies, obtains a large amount of data pertaining to the water resources of Iowa each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make this data readily available to interested parties outside of the Geological Survey, the data is published annually in this report series entitled "Water Resources Data - Iowa" as part of the National Water Data System.

Water-resources data for water year 2003 for Iowa consists of records of stage, discharge, and water quality of streams; stage and contents of lakes and reservoirs; and water levels and water quality of ground water. This volume of the report contains stage or discharge records for 134 gaging stations; stage records for 9 lakes and reservoirs; water-quality records for 4 gaging stations; sediment records for 11 gaging stations; peak-flow data for 90 crest-stage partial-record stations; and precipitation data collected at 6 gaging stations and 1 precipitation site. Additional water data were collected at various sites not included in the systematic data-collection program and are published as miscellaneous measurements and analyses.

Records of discharge or stage of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were published in an annual series; during 1961–65 and 1966–70, they were published in 5-year series. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States, or they may be purchased from Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225.

For water years 1961 through 1970, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1970 were similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1971 water year, water data for streamflow, water quality, and ground water are published in official U.S. Geological Survey reports on a State-boundary basis. These official reports carry an identification number consisting of the two-letter State postal abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report IA-03-1." These water-data reports are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

Additional information for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephone, (319) 337-4191.

Cooperation

The U.S. Geological Survey has had cooperative agreements with various governmental agencies in the State of Iowa for the systematic collection of streamflow records since 1914, ground-water levels since 1935, and water-quality records since 1943. During water year 2003, the agencies that assisted through cooperative agreements were:

Iowa Department of Natural Resources–Geological Survey
Iowa Department of Transportation
Iowa Highway Research Board

Iowa State University
University of Iowa, Institute of Hydraulic Research
University of Iowa, Hygienic Laboratory
University of Iowa

Appanoose County Board of Supervisors
Buchanan County emergency Management
Davis County Board of Supervisors

Fremont County Board of Supervisors
Lake Delhi Recreation Association
Lake Panorama Association
Limestone Bluffs RC&D
Van Buren County Board of Supervisors

City of Ames
City of Bettendorf
City of Bloomfield
City of Burlington
City of Cedar Falls
City of Cedar Rapids
City of Charles City
City of Clear Lake
City of Clinton
City of Coralville
City of Davenport
City of Decorah Water Department
City of Des Moines
City of Des Moines Water Works
City of Fort Dodge
City of Iowa City
City of Marshalltown
City of Milford
City of Mt. Pleasant
City of Ottumwa
City of Sioux City
City of Waterloo Water Pollution Control Plant
City of Waverly
City of West Des Moines

Services and financial assistance were provided by the U.S. Army Corps of Engineers in collecting streamflow records for 73 stream-gaging stations. Data were provided by NOAA-National Weather Service, U.S. Department of Commerce, and the U.S. Geological Survey Biological Resources Discipline. The following organizations aided in collecting records and are acknowledged in the respective station descriptions:

Milford Municipal Utilities
Central Iowa Energy Cooperative
Ameren-Union Electric Company

Summary of Hydrologic Conditions

Precipitation

Precipitation in Iowa during water year 2003 (October 1, 2002 to September 30, 2003) was below normal (table 1). Recorded precipitation ranged from 3.03 inches below normal in the Northwest Iowa Climatological District to 9.35 inches less than normal in the Southwest Iowa Climatological District (fig. 1). Statewide the average precipitation was 27.66 inches, which was 6.42 inches below normal or 81 percent of the normal 34.08 inches for 1971-2000. Overall, water year 2003 was the 24th driest and 38th coolest for 130 years of record. [In this summary of hydrologic conditions, all data and statistics pertaining to precipitation and temperature in Iowa were provided by Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, (oral and written commun., 2003)]

Table 1. Monthly and annual precipitation during the 2003 water year as a percentage of normal precipitation (1971-2000).

[Source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 2003]

National Weather Service Climatological District	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Annual
Northwest	146	9	12	50	122	95	80	112	119	106	28	117	90
North-central	146	10	28	36	59	85	83	118	110	109	26	57	81
Northeast	119	13	32	48	42	62	78	135	86	103	16	86	75
West-central	158	9	4	47	167	55	122	116	95	121	23	91	90
Central	132	10	12	39	78	45	118	124	92	112	18	87	82
East-central	180	10	37	36	36	45	76	93	84	116	22	111	76
Southwest	174	12	1	51	123	42	108	111	78	59	24	58	74
South-central	125	7	4	48	105	41	104	93	120	60	24	124	79
Southeast	132	8	39	38	86	38	104	90	108	103	49	121	83
Statewide	145	10	20	43	87	56	98	111	99	100	25	95	81

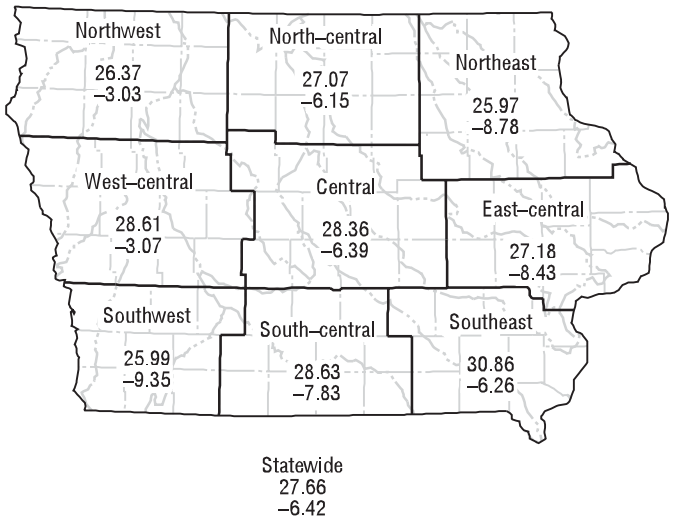


Figure 1. Water year 2003 precipitation record for the National Weather Service's designated Climatological Districts [upper value: average precipitation for the water year, in inches; lower value: deviation from long-term average (1971-2000), in inches; source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 2003)

Surface water

Streamflow

The annual runoff for water year 2003 at index station 05464500 Cedar River at Cedar Rapids was 2,269,000 acre-feet, which was 17 percent (459,000 acre-feet) less than the mean annual runoff for the period of record at the station. At index station 05480500 Des Moines River at Fort Dodge, the annual runoff was 1,243,000 acre-feet, which was 3 percent (37,000 acre-feet) less than the mean for the period of record. At index station 06810000 Nishnabotna River above Hamburg, runoff was 453,200 acre-feet, which was 50 percent (453,100 acre-feet) less than the mean for the period of record. The annual period-of-record runoffs at the index stations are shown in figure 2.

The locations of the active continuous-record gaging stations and crest-stage gaging stations for water year 2003 are shown in figure 3.

Suspended Sediment

Daily suspended-sediment discharge data (hereafter referred to as sediment discharge) were collected at 11 streamflow-gaging stations in Iowa during the 2003 water year. Four stations have 25 years or more of record: 05389500 Mississippi River at McGregor, 05465500 Iowa River at Wapello, 05474000 Skunk River at Augusta, and 05481650 Des Moines River near Saylorville; two stations on the Missouri River have 17 years of record: 06610000 Missouri River at Omaha, Nebraska and 06807000 Missouri River at Nebraska City, Nebraska; one station in northeast Iowa has 12 years of record: 05389400 Bloody Run Creek near Marquette; one station in east-central Iowa has 9 years of record; 05418500 Maquoketa River near Maquoketa; three stations in central Iowa have 8 years of record: 05471040 Squaw Creek near Colfax, 05487540 Walnut Creek near Prairie City, and 05487550 Walnut Creek near Vandalia. The locations of active sediment and surface-water-quality stations are shown in figure 4.

The peak daily sediment discharge on 7 of 11 stations occurred between May 6–20, after significant rain events. Two other stations peaked July 10-12.

Mississippi River at McGregor (05389500), which has most of its drainage basin in Minnesota and Wisconsin, had an annual sediment discharge of 948,000 tons, which was the eighth lowest sediment discharge in 28 years of record, and 58 percent of the average mean sediment discharge (fig. 5).

The sediment station on the Des Moines River near Saylorville (05481650) in central Iowa is downstream from a major flood-control reservoir (Saylorville Reservoir). The annual sediment discharge at this station for water year 2003 was 185,800 tons. This represents 80 percent of the 26-year mean sediment discharge. The mean annual sediment discharge since dam completion is 232,000 tons (fig. 5).

Sediment discharges for Iowa River at Wapello (05465500) and Skunk River at Augusta (05474000) in southeast Iowa were indicative of the below-normal precipitation in central and eastern Iowa. The Iowa River basin drainage includes parts of the Southeast, East-central, Central, Northeast, and North-central Climatological Districts, and drains an area nearly three times as large as the Skunk Basin. These districts had about 77 percent of normal precipitation. Wapello had an annual sediment discharge of 1.01 million tons, which is the third lowest sediment discharge, and represents 39 percent of the 25-year mean sediment discharge of 2.56 million tons (fig. 5). The headwaters of the Skunk River basin are in central Iowa and flow is southeasterly to the confluence with the Mississippi River. A substantial part of the drainage basin is located in the Southeast Climatological District. The annual precipitation for this district was **7**9 percent of normal for water year 2003. The 2003 annual sediment discharge for Skunk River at Augusta was 866,000 tons, which is the sixth lowest sediment discharge, and 32 percent of the 28-year mean sediment discharge of 2.66 million tons (fig. 5).

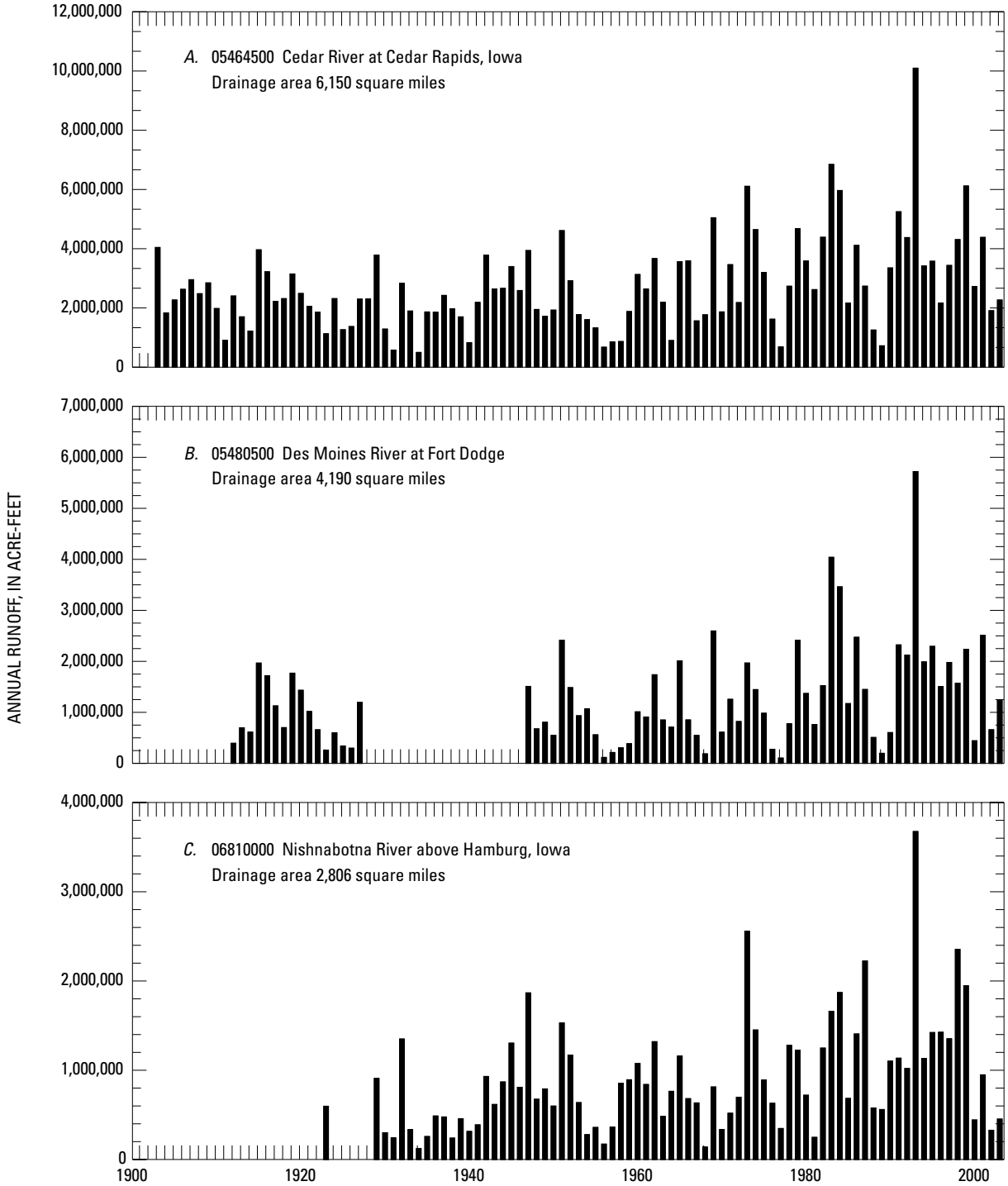


Figure 2. Annual runoff for period of record at index stations.

The 2003 annual sediment discharge for the small drainage basin in northeast Iowa; Bloody Run Creek near Marquette (05489400) was 783 tons with the largest percentage of total yearly runoff occurring in March at 20 percent. The annual runoff was 22 percent of the 12-year mean sediment discharge of 3,537 tons. The annual sediment discharge for the station in east-central Iowa, Maquoketa River near Maquoketa (05418500), had an annual sediment discharge of 245,000 tons and was the lowest sediment discharge in the 9-year record. Forty-three percent of the yearly total was measured in July.

The annual sediment discharge for the three stations located in central Iowa with less than approximately 20 square miles of drainage reflect precipitation patterns on small drainage basins. The annual sediment discharge for Squaw Creek

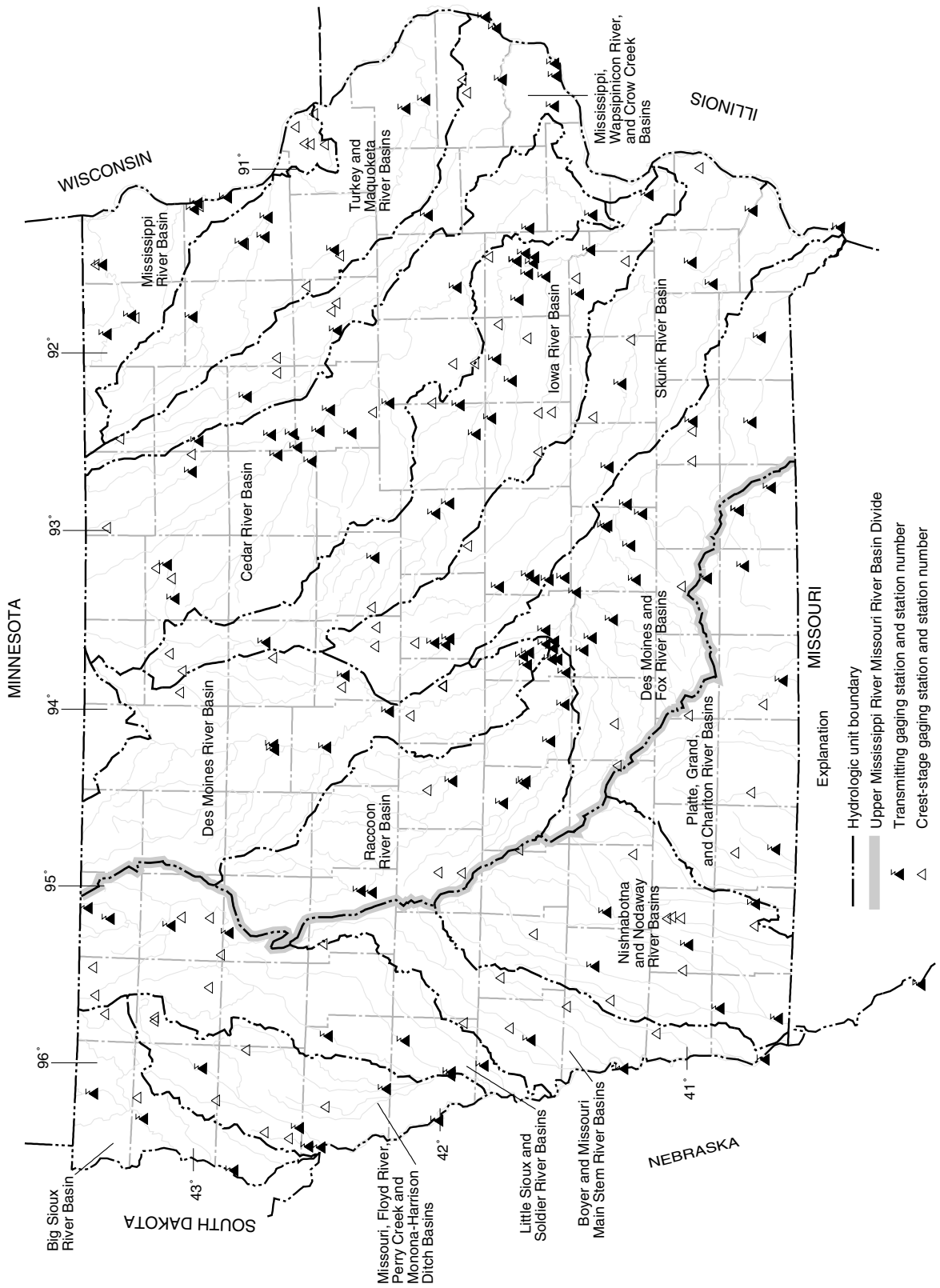


Figure 3. Location of continuous-record and crest-stage gaging stations in Iowa, water year 2003. See drainage-basin maps for gaging-station identification.

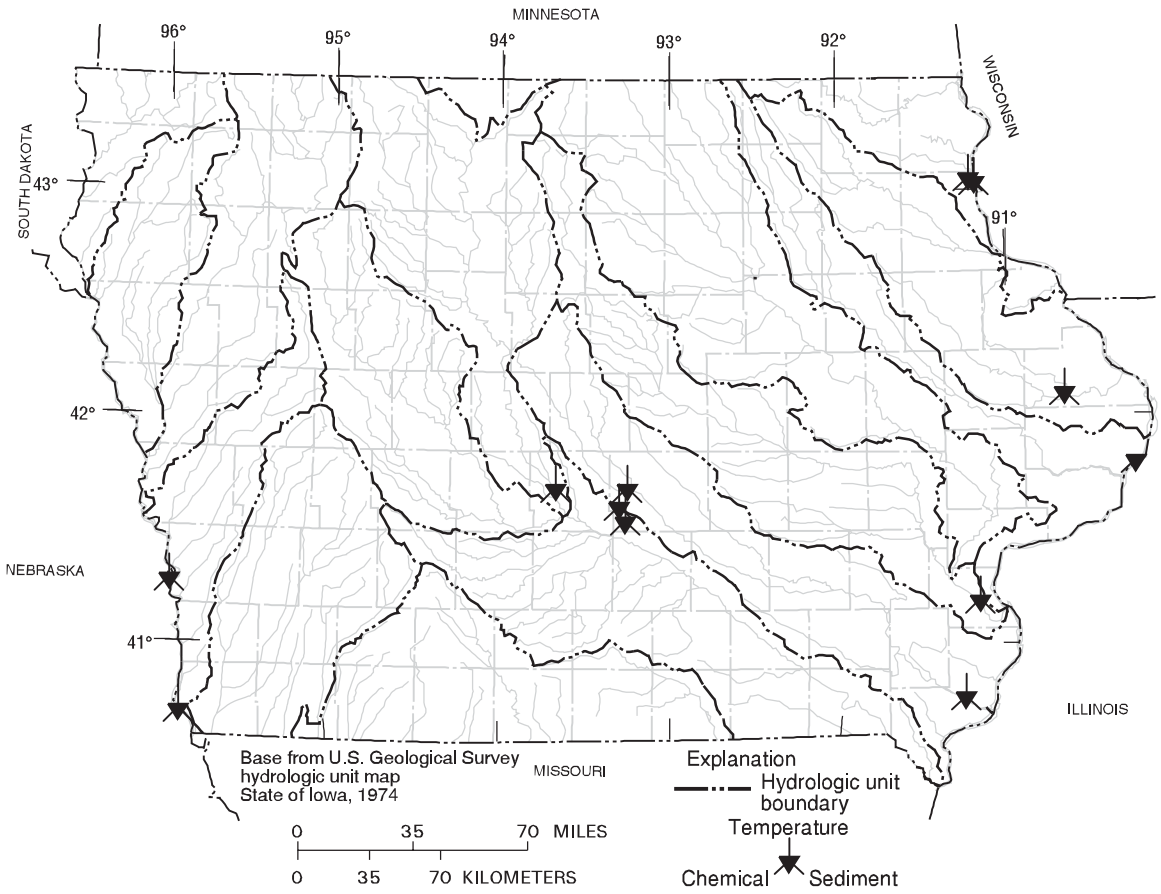


Figure 4. Location of active sediment and surface-water quality stations in Iowa, water year 2003.

near Colfax (05471040) was 4,570 tons. Seventy-nine percent of Squaw Creek's annual sediment discharge was measured in May. The annual sediment discharge for Walnut Creek near Prairie City (05487540) was 533 tons, while Walnut Creek near Vandalia (05487550) was 8,890 tons of annual sediment discharge. Vandalia has a drainage area approximately three times the size of Prairie City, but had about 17 times the amount of sediment discharge of Prairie City.

The two Missouri River stations (fig. 4) have large drainage areas, which the sediment discharges reflect. The annual sediment discharge at Omaha was 9.85 million tons, which was 50 percent of the 17-year mean of 19.7 million tons. The annual sediment discharge at Nebraska City was 14.7 million tons, which was 48 percent of the 17-year mean of 30.6 million tons.

Water Quality

Surface-water-quality data were collected in Iowa during water year 2003 at two National Stream-Quality Accounting Network (NASQAN) stations. The NASQAN stations in Iowa are the Mississippi River at Clinton (station number 05420500) and Missouri River at Omaha (06610000). The combined drainage area of the two stations is approximately 408,000 mi^2. Land use throughout the two drainage basins is primarily agricultural. Fifteen water samples were collected at Missouri River at Omaha and 13 water samples were collected at Mississippi River at Clinton during the 2003 water year.

Nearly all the samples collected at the two stations contained detectable concentrations of agricultural chemicals. Dissolved nitrite plus nitrate as nitrogen (hereafter referred to as nitrate) were common during the 2003 water year, with all samples containing concentrations greater than the detection level of 0.05 mg/L (milligrams per liter).

Nitrate concentrations at Clinton ranged from less than 0.06 mg/L on August 19 and September 8 to 1.83 mg/L, on February 20. Nitrate concentrations at Omaha ranged from 0.09 mg/L on September 9 to 2.62 mg/L, on July 11. Nitrate concentrations in water samples did not exceed 10 mg/L, which is the U.S. Environmental Protection Agency (USEPA), (Maximum Contaminate Level (MCL) for public drinking water, USEPA, 1990 Maximum contaminant levels, subpart B of part 141, National primary drinking water regulations: U.S.Code of Federal Regulations, Title 40, Parts 100 to 149, revised as of July 1, 1990, p.553-677).

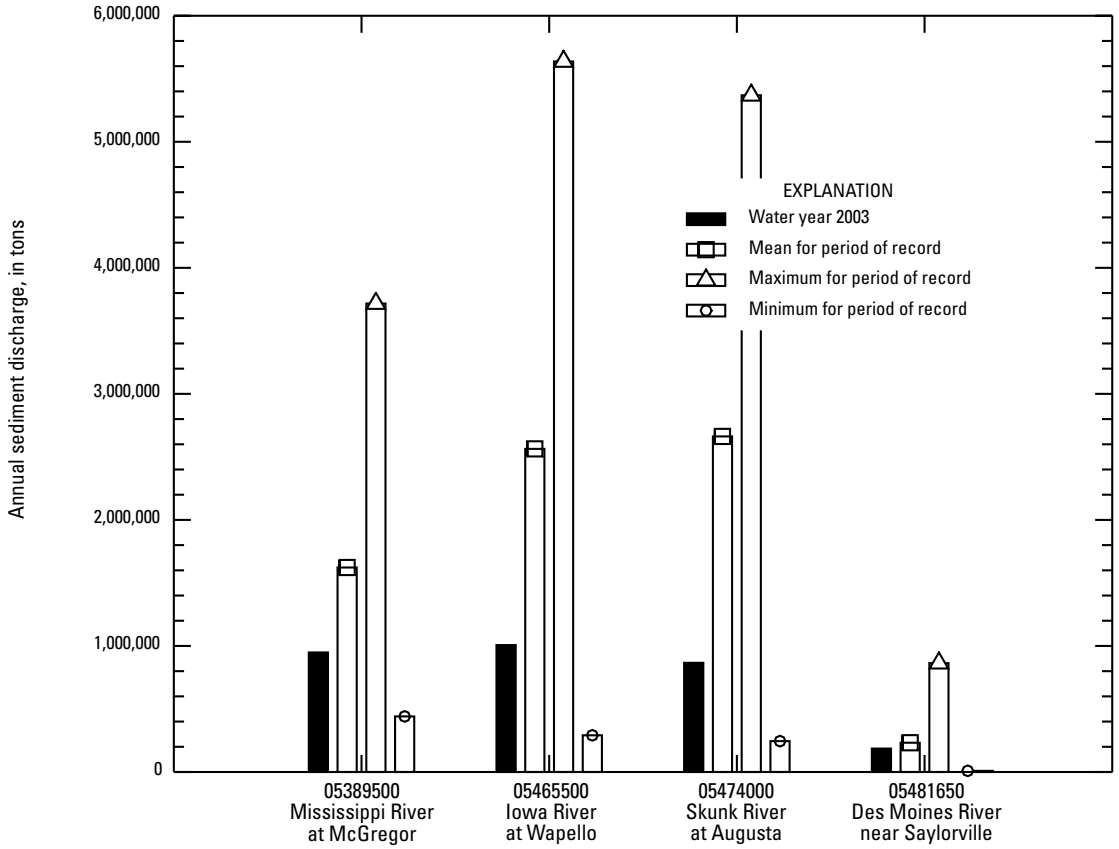


Figure 5. Annual sediment discharge statistics at four long-term streamflow-gaging stations, water year 2003.

Pesticide analyses were completed for 28 water samples collected at the two NASQAN stations. Atrazine and metolachlor, two of the most commonly used herbicides in Iowa, were detected throughout the year at both NASQAN stations. Some of the detections of herbicide concentrations were at very low detection limits and are marked with an "E" code for an estimated value. An "E" code means the compound was detected but that the value is approaching quantifiable limits. Acetochlor was detected 11 times at Omaha and seven times at Clinton. The largest herbicide concentration was 6.00 µg/L (micrograms per liter) of atrazine in the water sample collected from the Missouri River on May 1. The largest overall concentration of acetochlor, alachlor, atrazine, cyanazine, and metolachlor in a single event also was on the Missouri River on May 1. This water sample had 5.31 µg/L of acetochlor, 0.068 µg/L of alachlor, 6.00 µg/L of atrazine, less than 0.018 µg/L of cyanazine, and 3.21 µg/L of metolachlor. The only herbicide that exceeded U.S. Environmental Protection Agency MCL's (USEPA,1992, Fact sheet: EPA 570/9-91-012FS, December 1992) was atrazine at the Missouri River site.

The USEPA MCL for atrazine is 3.0 µg/L. The Missouri River at Omaha had atrazine above the MCL on May 1 with a value of 6.00 µg/L. Herbicide concentrations were generally larger in samples collected during May, June, and July than in samples collected at other times during water year 2003. Water samples collected in October through February had the lowest overall concentrations of the five herbicides during the 2003 water year.

Downstream Order and Station Number

Since October 1, 1950, hydrologic-station records in USGS reports have been listed in order of downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary entering between two main-stream stations is listed between those stations. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary on which a station is located with respect to the stream to which it is immediately tributary is indicated by an indention in that list of stations in the front of this report. Each indentation represents one rank. This downstream order and system of indentation indicates which stations are on tributaries between any two stations and the rank of the tributary on which each station is located.

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These station numbers are in the same downstream order used in this report. In assigning a station number, no distinction

is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list composed of both types of stations. Gaps are consecutive. The complete 8-digit (or 10-digit) number for each station such as 05454500, which appears just to the left of the station name, includes a 2-digit part number "05" plus the 6-digit (or 8-digit) downstream order number "454500." In areas of high station density, an additional two digits may be added to the station identification number to yield a 10-digit number. The stations are numbered in downstream order as described above between stations of consecutive 8-digit numbers.

Special Networks and Programs

Hydrologic Benchmark Network is a network of 61 sites in small drainage basins in 39 States that was established in 1963 to provide consistent streamflow data representative of undeveloped watersheds nationwide, and from which data could be analyzed on a continuing basis for use in comparison and contrast with conditions observed in basins more obviously affected by human activities. At selected sites, water-quality information is being gathered on major ions and nutrients, primarily to assess the effects of acid deposition on stream chemistry. Additional information on the Hydrologic Benchmark Program may be accessed from *http://water.usgs.gov/hbn/*.

National Stream-Quality Accounting Network (NASQAN) is a network of sites used to monitor the water quality of large rivers within the Nation's largest river basins. From 1995 through 1999, a network of approximately 40 stations was operated in the Mississippi, Columbia, Colorado, and Rio Grande River basins. For the period 2000 through 2005, sampling was reduced to 27 index stations so that a network of 5 stations could be implemented on the Yukon River. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment (NAWQA) Program; (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals. Additional information about the NASQAN Program may be accessed from *http://water.usgs.gov/nasqan/*.

The National Atmospheric Deposition Program/ National Trends Network (NADP/NTN) is a network of monitoring sites that provide continuous measurement and assessment of the chemical constituents in precipitation throughout the United States. As the lead Federal agency, the USGS works together with over 100 organizations to provide a long-term, spatial and temporal record of atmospheric deposition generated from this network of 250 precipitation-chemistry monitoring sites. The USGS supports 74 of these 250 sites. This long-term, nationally consistent monitoring program, coupled with ecosystem research, provides critical information toward a national scorecard to evaluate the effectiveness of ongoing and future regulations intended to reduce atmospheric emissions and subsequent impacts to the Nation's land and water resources. Reports and other information on the NADP/NTN Program, as well as data from the individual sites, may be accessed from *http://bqs.usgs.gov/acidrain/*.

The USGS National Water-Quality Assessment (NAWQA) Program is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; to provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and to provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 42 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents is measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for water-resources managers to use in making decisions and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and Federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key Federal, State, and local water-resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies. Additional information about the NAWQA Program may be accessed from *http://water.usgs.gov/nawqa/*.

The USGS National Streamflow Information Program (NSIP) is a long-term program with goals to provide framework streamflow data across the Nation. Included in the program are creation of a permanent Federally funded streamflow network, research on the nature of streamflow, regional assessments of streamflow data and databases, and upgrades in the streamflow information delivery systems. Additional information about NSIP may be accessed from *http://water.usgs.gov/nsip/*.

Explanation of Stage- and Water Discharge Records

Data Collection and Computation

The base data collected at gaging stations (fig. 3) consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and volume of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that is either downloaded electronically in the field to a laptop computer or similar device or is transmitted using telemetry such as GOES satellite, land-line or cellular-phone modems, or by radio transmission. Measurements of discharge are made with a current meter or acoustic Doppler current profiler, using the general methods adopted by the USGS. These methods are described in standard textbooks, USGS Water-Supply Paper 2175, and the Techniques of Water-Resources Investigations of the United States Geological Survey (TWRIs), Book 3, Chapters A1 through A19 and Book 8, Chapters A2 and B2. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

For stream-gaging stations, discharge-rating tables for any stage are prepared from stage-discharge curves. If extensions to the rating curves are necessary to express discharge greater than measured, the extensions are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams and weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily values. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features of the stream channel, the daily mean discharge is computed by the shifting-control method in which correction factors based on individual discharge measurements and notes by engineers and observers are used when applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the controlling section, the daily mean discharge is computed by the shifting-control method.

The stage-discharge relation at some stream-gaging stations is affected by backwater from reservoirs, tributary streams, or other sources. Such an occurrence necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage at some distance from the base gage.

An index velocity is measured using ultrasonic or acoustic instruments at some stream-gaging stations and this index velocity is used to calculate an average velocity for the flow in the stream. This average velocity along with a stage-area relation is then used to calculate average discharge.

At some stations, stage-discharge relation is affected by changing stage. At these stations, the rate of change in stage is used as a factor in computing discharge.

At some stream-gaging stations in the northern United States, the stage-discharge relation is affected by ice in the winter; therefore, computation of the discharge in the usual manner is impossible. Discharge for periods of ice effect is computed on the basis of gage-height record and occasional winter-discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge from other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the volume or contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly changes are computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys, the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some stream-gaging stations, periods of time occur when no gage-height record is obtained or the recorded gage height is faulty and cannot be used to compute daily discharge or contents. Such a situation can happen when the recorder stops or otherwise fails to operate properly, the intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records from other stations in the same or nearby basins. Likewise, lake or reservoir volumes may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

Data Presentation

The records published for each continuous-record surface-water discharge station (stream-gaging station) consist of five parts: (1) the station manuscript or description; (2) the data table of daily mean values of discharge for the current water year with summary data; (3) a tabular statistical summary of monthly mean flow data for a designated period, by water year; (4) a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration; and (5) a hydrograph of discharge.

Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments follow that clarify information presented under the various headings of the station description.

LOCATION.—Location information is obtained from the most accurate maps available. The location of the gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.—Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.—This term indicates the time period for which records have been published for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not and whose location was such that its flow reasonably can be considered equivalent to flow at the present station.

REVISED RECORDS.—If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

GAGE.—The type of gage in current use, the datum of the current gage referred to a standard datum, and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.—All periods of estimated daily discharge either will be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily discharge table. (See section titled Identifying Estimated Daily Discharge.) Information is presented relative to the accuracy of the records, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, the outlet works and spillway, and the purpose and use of the reservoir.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES OUTSIDE PERIOD OF RECORD.—Information here documents major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the USGS.

REVISIONS.—Records are revised if errors in published records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb (*http://water.usgs.gov/nwis/nwis*). Users are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent data updates. Updates to NWISWeb are made on an annual basis.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because no current or, possibly, future station manuscript would be published for these stations to document the revision in a REVISED RECORDS entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were revised after the station was discontinued. If, however, the data for a discontinued station were obtained by computer retrieval, the data would be current. Any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the REMARKS and in the inclusion of a stage-capacity table when daily volumes are given.

Peak Discharge Greater than Base Discharge

Tables of peak discharge above base discharge are included for some stations where secondary instantaneous peak discharge data are used in flood-frequency studies of highway and bridge design, flood-control structures, and other flood-related projects. The base discharge value is selected so an average of three peaks a year will be reported. This base discharge value has a recurrence interval of approximately 1.1 years or a 91-percent chance of exceedence in any 1 year.

Data Table of Daily Mean Values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed TOTAL gives the sum of the daily figures for each month; the line headed MEAN gives the arithmetic average flow in cubic feet per second for the month; and the lines headed MAX and MIN give the maximum and minimum daily mean discharges, respectively, for each month. Discharge for the month is expressed in cubic feet per second per square mile (line headed CFSM); or in inches (line headed IN); or in acre-feet (line headed AC-FT). Values for cubic feet per second per square mile and runoff in inches or in acre-feet may be omitted if extensive regulation or

diversion is in effect or if the drainage area includes large noncontributing areas. At some stations, monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir volumes are given. These values are identified by a symbol and a corresponding footnote.

Statistics of Monthly Mean Data

A tabular summary of the mean (line headed MEAN), maximum (MAX), and minimum (MIN) of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those values. The designated period will be expressed as FOR WATER YEARS __-__, BY WATER YEAR (WY), and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. The designated period will consist of all of the station record within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript.

Summary Statistics

A table titled SUMMARY STATISTICS follows the statistics of monthly mean data tabulation. This table consists of four columns with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, WATER YEARS __-__, will consist of all of the station records within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (see line headings below), except for the ANNUAL 7-DAY MINIMUM statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When the dates of occurrence do not fall within the selected water years listed in the heading, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration-curve statistics and runoff data also are given. Runoff data may be omitted if extensive regulation or diversion of flow is in effect in the drainage basin.

The following summary statistics data are provided with each continuous record of discharge. Comments that follow clarify information presented under the various line headings of the SUMMARY STATISTICS table.

ANNUAL TOTAL.—The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.—The arithmetic mean for the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.—The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.—The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.—The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.—The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.—The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. This value should not be confused with the 7-day 10-year low-flow statistic.

MAXIMUM PEAK FLOW.—The maximum instantaneous peak discharge occurring for the water year or designated period. Occasionally the maximum flow for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak flow is given in the table and the maximum flow may be reported in a footnote or in the REMARKS paragraph in the manuscript.

MAXIMUM PEAK STAGE.—The maximum instantaneous peak stage occurring for the water year or designated period. Occasionally the maximum stage for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak stage is given in the table and the maximum stage may be reported in the REMARKS paragraph in the manuscript or in a footnote. If the dates of occurrence of the maximum peak stage and maximum peak flow are different, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.—The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.—Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Cubic feet per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicate the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.—The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.—The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.—The discharge that has been exceeded 90 percent of the time for the designated period.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first table lists annual maximum stage and discharge at crest-stage stations, and the second table lists discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are often made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for a special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified. This identification is shown either by flagging individual daily values with the letter "e" and noting in a table footnote, "e–Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of Field Data and Computed Results

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretations of records.

The degree of accuracy of the records is stated in the REMARKS in the station description. "Excellent" indicates that about 95 percent of the daily discharges are within 5 percent of the true value; "good" within 10 percent; and "fair," within 15 percent. "Poor" indicates that daily discharges have less than "fair" accuracy. Different accuracies may be attributed to different parts of a given record.

Values of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft^3/s; to the nearest tenths between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to 3 significant figures above 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharge values listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, values of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Data Records Available

Information of a more detailed nature than that published for most of the stream-gaging stations such as discharge measurements, gage-height records, and rating tables is available from the District office. Also, most stream-gaging station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the District office (see address that is shown on the back of the title page of this report).

Explanation of Precipitation Records

Data Collection and Computation

Rainfall data generally are collected using electronic data loggers that measure the rainfall in 0.01-inch increments every 15 minutes using either a tipping-bucket rain gage or a collection well gage. Twenty-four hour rainfall totals are tabulated and presented. A 24-hour period extends from just past midnight of the previous day to midnight of the current day. Snowfall-affected data can result during cold weather when snow fills the rain-gage funnel and then melts as temperatures rise. Snowfall-affected data are subject to errors. Missing values are indicated by this symbol "---" in the table.

Data Presentation

Precipitation records collected at surface-water gaging stations are identified with the same station number and name as the stream-gaging station. Where a surface-water daily-record station is not available, the precipitation record is published with its own name and latitude-longitude identification number.

Information pertinent to the history of a precipitation station is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, period of record, and general remarks.

The following information is provided with each precipitation station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

INSTRUMENTATION.—Information on the type of rainfall collection system is given.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of records.

Explanation of Water-Quality Records

Collection and Examination of Data

Surface-water samples for analysis usually are collected at or near stream-gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, water temperature, sediment discharge, and so forth); extremes for the current year; and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, sampling date, or other pertinent data are given in the table containing the chemical analyses of the ground water.

Water Analysis

Most of the methods used for collecting and analyzing water samples are described in the TWRIs. A list of TWRIs is provided in this report.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross-section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum and minimum values (and sometimes mean or median values) for each constituent measured, and are based on 15-minute or 1-hour intervals of recorded data beginning at 0000 hours and ending at 2400 hours for the day of record.

Surface-Water-Quality Records

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because discharge data is useful in the interpretation of surface-water quality. Records of surface-water quality in this report involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A *continuous-record station* is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A *partial-record station* is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A *miscellaneous sampling site* is a location other than a continuous- or partial-record station, where samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between *continuous records* as used in this report and *continuous recordings* that refer to a continuous graph or a series of discrete values recorded at short intervals. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 4.

Accuracy of the Records

One of four accuracy classifications is applied for measured physical properties at continuous-record stations on a scale ranging from poor to excellent. The accuracy rating is based on data values recorded before any shifts or corrections are made. Additional consideration also is given to the amount of publishable record and to the amount of data that have been corrected or shifted.

Rating classifications for continuous water-quality records

[≤, less than or equal to; , plus or minus value shown; °C, degree Celsius; >, greater than; %, percent; mg/L, milligram per liter; pH unit, standard pH unit]

Measured physical property	Rating			
	Excellent	Good	Fair	Poor
Water temperature	≤ 0.2°C	> 0.2 to 0.5°C	> 0.5 to 0.8°C	> 0.8°C
Specific conductance	≤ 3%	> 3 to 10%	> 10 to 15%	> 15%
Dissolved oxygen	≤ 0.3 mg/L	> 0.3 to 0.5 mg/L	> 0.5 to 0.8 mg/L	> 0.8 mg/L
pH	≤ 0.2 unit	> 0.2 to 0.5 unit	> 0.5 to 0.8 unit	> 0.8 unit
Turbidity	≤ 5%	> 5 to 10%	> 10 to 15%	> 15%

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern is assuring that the data obtained represent the naturally occurring quality of the water. To ensure this, certain measurements, such as water temperature, pH, and dissolved oxygen, must be made on site when the samples are taken. To assure that measurements made in the laboratory also represent the naturally occurring water, carefully prescribed procedures must be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRIs Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1-A9. These TWRIs are listed in this report. Also, detailed information on collecting, treating, and shipping samples can be obtained from the USGS District office (see address that is shown on the back of title page in this report).

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at the time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the District office.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross section.

During periods of rapidly changing flow or rapidly changing concentration, samples may be collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge

for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples are collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observation, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

Laboratory Measurements

Samples for biochemical oxygen demand (BOD) and indicator bacteria are analyzed locally. All other samples are analyzed in the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chapter C1. Methods used by the USGS laboratories are given in the TWRIs, Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. These methods are consistent with ASTM standards and generally follow ISO standards.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

DRAINAGE AREA.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—This indicates the time periods for which published water-quality records for the station are available. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.—Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES.—Maximums and minimums are given only for parameters measured daily or more frequently. For parameters measured weekly or less frequently, true maximums or minimums may not have been obtained. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.—Records are revised if errors in published water-quality records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb (*http://waterdata.usgs.gov/nwis*). Users of USGS water-quality data are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent updates. Updates to the NWISWeb are made on an annual basis.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remarks codes may appear with the water-quality data in this section.

Printed Output	Remark
E or e	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).

Printed Output	Remark
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
V	Analyte was detected in both the environmental sample and the associated blanks.
&	Biological organism estimated as dominant.

Water-Quality Control Data

The USGS National Water Quality Laboratory collects quality-control data on a continuing basis to evaluate selected analytical methods to determine long-term method detection levels (LT-MDLs) and laboratory reporting levels (LRLs). These values are re-evaluated each year on the basis of the most recent quality-control data and, consequently, may change from year to year.

This reporting procedure limits the occurrence of false positive error. Falsely reporting a concentration greater than the LT-MDL for a sample in which the analyte is not present is 1 percent or less. Application of the LRL limits the occurrence of false negative error. The chance of falsely reporting a non-detection for a sample in which the analyte is present at a concentration equal to or greater than the LRL is 1 percent or less.

Accordingly, concentrations are reported as less than LRL for samples in which the analyte was either not detected or did not pass identification. Analytes detected at concentrations between the LT-MDL and the LRL and that pass identification criteria are estimated. Estimated concentrations will be noted with a remark code of "E." These data should be used with the understanding that their uncertainty is greater than that of data reported without the E remark code.

Data generated from quality-control (QC) samples are a requisite for evaluating the quality of the sampling and processing techniques as well as data from the actual samples themselves. Without QC data, environmental sample data cannot be adequately interpreted because the errors associated with the sample data are unknown. The various types of QC samples collected by this District office are described in the following section. Procedures have been established for the storage of water-quality-control data within the USGS. These procedures allow for storage of all derived QC data and are identified so that they can be related to corresponding environmental samples. These data are not presented in this report but are available from the District office.

Blank Samples

Blank samples are collected and analyzed to ensure that environmental samples have not been contaminated in the overall data-collection process. The blank solution used to develop specific types of blank samples is a solution that is free of the analytes of interest. Any measured value signal in a blank sample for an analyte (a specific component measured in a chemical analysis) that was absent in the blank solution is believed to be due to contamination. Many types of blank samples are possible; each is designed to segregate a different part of the overall data-collection process. The types of blank samples collected are:

Field blank—A blank solution that is subjected to all aspects of sample collection, field processing preservation, transportation, and laboratory handling as an environmental sample.

Trip blank—A blank solution that is put in the same type of bottle used for an environmental sample and kept with the set of sample bottles before and after sample collection.

Equipment blank—A blank solution that is processed through all equipment used for collecting and processing an environmental sample (similar to a field blank but normally done in the more controlled conditions of the office).

Sampler blank—A blank solution that is poured or pumped through the same field sampler used for collecting an environmental sample.

Filter blank—A blank solution that is filtered in the same manner and through the same filter apparatus used for an environmental sample.

Splitter blank—A blank solution that is mixed and separated using a field splitter in the same manner and through the same apparatus used for an environmental sample.

Preservation blank—A blank solution that is treated with the sampler preservatives used for an environmental sample.

Reference Samples

Reference material is a solution or material prepared by a laboratory. The reference material composition is certified for one or more properties so that it can be used to assess a measurement method. Samples of reference material are submitted for analysis to ensure that an analytical method is accurate for the known properties of the reference material. Generally, the selected reference material properties are similar to the environmental sample properties.

Replicate Samples

Replicate samples are a set of environmental samples collected in a manner such that the samples are thought to be essentially identical in composition. Replicate is the general case for which a duplicate is the special case consisting of two samples. Replicate samples are collected and analyzed to establish the amount of variability in the data contributed by some part of the

collection and analytical process. Many types of replicate samples are possible, each of which may yield slightly different results in a dynamic hydrologic setting, such as a flowing stream. The types of replicate samples collected in this district are:

Concurrent Samples--A type of replicate sample in which the samples are collected simultaneously with two or more samplers or by using one sampler and alternating the collection of samples into two or more compositing containers.

Sequential samples—A type of replicate sample in which the samples are collected one after the other, typically over a short time.

Split sample—A type of replicate sample in which a sample is split into subsamples, each subsample contemporaneous in time and space.

Spike Samples

Spike samples are samples to which known quantities of a solution with one or more well-established analyte concentrations have been added. These samples are analyzed to determine the extent of matrix interference or degradation on the analyte concentration during sample processing and analysis.

Access to USGS Water Data

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with the necessary telemetry and historic daily-mean and peak-flow discharge data for most current or discontinued gaging stations through the World Wide Web (WWW). These data may be accessed from *http://water.usgs.gov*.

Water-quality data and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on various media. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each Water Discipline District Office (See address that is shown on the back of the title page of this report.)

Definition of Terms

Specialized technical terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. Terms such as algae, water level, and precipitation are used in their common everyday meanings, definitions of which are given in standard dictionaries. Not all terms defined in this alphabetical list apply to every State. See also table for converting English units to International System (SI) Units. Other glossaries that also define water-related terms are accessible from *http://water.usgs.gov/glossaries.html*.

Acid neutralizing capacity (ANC) is the equivalent sum of all bases or base-producing materials, solutes plus particulates, in an aqueous system that can be titrated with acid to an equivalence point. This term designates titration of an "unfiltered" sample (formerly reported as alkalinity).

Acre-foot (AC-FT, acre-ft) is a unit of volume, commonly used to measure quantities of water used or stored, equivalent to the volume of water required to cover 1 acre to a depth of 1 foot and equivalent to 43,560 cubic feet, 325,851 gallons, or 1,233 cubic meters. (See also "Annual runoff")

Adenosine triphosphate (ATP) is an organic, phosphate-rich compound important in the transfer of energy in organisms. Its central role in living cells makes ATP an excellent indicator of the presence of living material in water. A measurement of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter.

Adjusted discharge is discharge data that have been mathematically adjusted (for example, to remove the effects of a daily tide cycle or reservoir storage).

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample. (See also "Biomass" and "Dry weight")

Alkalinity is the capacity of solutes in an aqueous system to neutralize acid. This term designates titration of a "filtered" sample.

Annual runoff is the total quantity of water that is discharged ("runs off") from a drainage basin in a year. Data reports may present annual runoff data as volumes in acre-feet, as discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches.

Annual 7-day minimum is the lowest mean value for any 7-consecutive-day period in a year. Annual 7-day minimum values are reported herein for the calendar year and the water year (October 1 through September 30). Most low-flow frequency analyses use a climatic year (April 1-March 31), which tends to prevent the low-flow period from being artificially split between adjacent years. The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day, 10-year low-flow statistic.)

Aroclor is the registered trademark for a group of polychlorinated biphenyls that were manufactured by the Monsanto Company prior to 1976. Aroclors are assigned specific 4-digit reference numbers dependent upon molecular type and degree of substitution of the biphenyl ring hydrogen atoms by chlorine atoms. The first two digits of a numbered aroclor represent the molecular type, and the last two digits represent the percentage weight of the hydrogen-substituted chlorine.

Artificial substrate is a device that purposely is placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is collected. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection. (See also "Substrate")

Ash mass is the mass or amount of residue present after the residue from a dry-mass determination has been ashed in a muffle furnace at a temperature of 500 °C for 1 hour. Ash mass of zooplankton and phytoplankton is expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2). (See also "Biomass" and "Dry mass")

Aspect is the direction toward which a slope faces with respect to the compass.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, whereas others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Bankfull stage, as used in this report, is the stage at which a stream first overflows its natural banks formed by floods with 1- to 3-year recurrence intervals.

Base discharge (for peak discharge) is a discharge value, determined for selected stations, above which peak discharge data are published. The base discharge at each station is selected so that an average of about three peak flows per year will be published. (See also "Peak flow")

Base flow is sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by ground-water discharge.

Bed material is the sediment mixture of which a stream-bed, lake, pond, reservoir, or estuary bottom is composed. (See also "Bedload" and "Sediment")

Bedload is material in transport that primarily is supported by the streambed. In this report, bedload is considered to consist of particles in transit from the bed to the top of the bedload sampler nozzle (an elevation ranging from 0.25 to 0.5 foot). These particles are retained in the bedload sampler. A sample collected with a pressure-differential bedload sampler also may contain a component of the suspended load.

Bedload discharge (tons per day) is the rate of sediment moving as bedload, reported as dry weight, that passes through a cross section in a given time. NOTE: Bedload discharge values in this report may include a component of the suspended-sediment discharge. A correction may be necessary when computing the total sediment discharge by summing the bedload discharge and the suspended-sediment discharge. (See also "Bedload," "Dry weight," "Sediment," and "Suspended-sediment discharge")

Benthic organisms are the group of organisms inhabiting the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are useful as indicators of water quality.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as mass per unit area or volume of habitat.

Biomass pigment ratio is an indicator of the total proportion of periphyton that are autotrophic (plants). This also is called the Autotrophic Index.

Blue-green algae (*Cyanophyta*) are a group of phytoplankton and periphyton organisms with a blue pigment in addition to a green pigment called chlorophyll. Blue-green algae can cause nuisance water-quality conditions in lakes and slow-flowing rivers; however, they are found commonly in streams throughout the year. The abundance of blue-green algae in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter (μm^3/mL). The abundance of blue-green algae in periphyton samples is given in cells per square centimeter ($cells/cm^2$) or biovolume per square centimeter ($\mu m^3/cm^2$). (See also "Phytoplankton"and "Periphyton")

Bottom material (See "Bed material")

Bulk electrical conductivity is the combined electrical conductivity of all material within a doughnut-shaped volume surrounding an induction probe. Bulk conductivity is affected by different physical and chemical properties of the material

including the dissolved-solids content of the pore water, and the lithology and porosity of the rock.

Canadian Geodetic Vertical Datum 1928 is a geodetic datum derived from a general adjustment of Canada's first order level network in 1928.

Cell volume (biovolume) determination is one of several common methods used to estimate biomass of algae in aquatic systems. Cell members of algae are used frequently in aquatic surveys as an indicator of algal production. However, cell numbers alone cannot represent true biomass because of considerable cell-size variation among the algal species. Cell volume (μm^3) is determined by obtaining critical cell measurements or cell dimensions (for example, length, width, height, or radius) for 20 to 50 cells of each important species to obtain an average biovolume per cell. Cells are categorized according to the correspondence of their cellular shape to the nearest geometric solid or combinations of simple solids (for example, spheres, cones, or cylinders). Representative formulae used to compute biovolume are as follows:

$$\text{sphere } 4/3\ \pi r^3 \quad \text{cone } 1/3\ \pi r^2 h \quad \text{cylinder } \pi r^2 h.$$

pi (π) is the ratio of the circumference to the diameter of a circle; pi = 3.14159….

From cell volume, total algal biomass expressed as biovolume ($\mu m^3/mL$) is thus determined by multiplying the number of cells of a given species by its average cell volume and then summing these volumes for all species.

Cells/volume refers to the number of cells of any organism that is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample volume, and generally are reported as cells or units per milliliter (mL) or liter (L).

Cfs-day (See "Cubic foot per second-day")

Channel bars, as used in this report, are the lowest prominent geomorphic features higher than the channel bed.

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with BOD or with carbonaceous organic pollution from sewage or industrial wastes. [See also "Biochemical oxygen demand (BOD)"]

Clostridium perfringens *(C. perfringens)* is a spore-forming bacterium that is common in the feces of human and other warmblooded animals. Clostridial spores are being used experimentally as an indicator of past fecal contamination and the presence of microorganisms that are resistant to disinfection and environmental stresses. (See also "Bacteria")

Coliphages are viruses that infect and replicate in coliform bacteria. They are indicative of sewage contamination of water and of the survival and transport of viruses in the environment.

Color unit is produced by 1 milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Confined aquifer is a term used to describe an aquifer containing water between two relatively impermeable bound-aries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases, the water level can rise above the ground surface, yielding a flowing well.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Continuous-record station is a site where data are collected with sufficient frequency to define daily mean values and variations within a day.

Control designates a feature in the channel that physically affects the water-surface elevation and thereby determines the stage-discharge relation at the gage. This feature may be a constriction of the channel, a bedrock outcrop, a gravel bar, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure, as used in this report, is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of saltwater.

Cubic foot per second (CFS, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point in 1 second. It is equivalent to approximately 7.48 gallons per second or approximately 449 gallons per minute, or 0.02832 cubic meters per second. The term "second-foot" sometimes is used synonymously with "cubic foot per second" but is now obsolete.

Cubic foot per second-day (CFS-DAY, Cfs-day, [(ft^3/s)/d]) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.98347 acre-feet, 646,317 gallons, or 2,446.6 cubic meters. The daily mean discharges reported in the daily value data tables numerically are equal to the daily volumes in cfs-days, and the totals also represent volumes in cfs-days.

Cubic foot per second per square mile [CFSM, $(ft^3/s)/mi^2$] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area. (See also "Annual runoff")

Daily mean suspended-sediment concentration is the time-weighted mean concentration of suspended sediment passing a stream cross section during a 24-hour day. (See also "Sediment" and "Suspended-sediment concentration")

Daily record station is a site where data are collected with sufficient frequency to develop a record of one or more data values per day. The frequency of data collection can range from continuous recording to data collection on a daily or near-daily basis.

Data collection platform (DCP) is an electronic instrument that collects, processes, and stores data from various sensors, and transmits the data by satellite data relay, line-of-sight radio, and/or landline telemetry.

Data logger is a microprocessor-based data acquisition system designed specifically to acquire, process, and store data. Data usually are downloaded from onsite data loggers for entry into office data systems.

Datum is a surface or point relative to which measurements of height and/or horizontal position are reported. A vertical datum is a horizontal surface used as the zero point for measurements of gage height, stage, or elevation; a horizontal datum is a reference for positions given in terms of latitude-longitude, State Plane coordinates, or Universal Transverse Mercator (UTM) coordinates. (See also "Gage datum," "Land-surface datum," "National Geodetic Vertical Datum of 1929," and "North American Vertical Datum of 1988")

Diatoms *(Bacillariophyta)* are unicellular or colonial algae with a siliceous cell wall. The abundance of diatoms in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter (μm^3/mL). The abundance of diatoms in periphyton samples is given in cells per square centimeter (cells/cm^2) or biovolume per square centimeter ($\mu m^3/cm^2$). (See also "Phytoplankton" and "Periphyton")

Diel is of or pertaining to a 24-hour period of time; a regular daily cycle.

Discharge, or **flow**, is the rate that matter passes through a cross section of a stream channel or other water body per unit of time. The term commonly refers to the volume of water (including, unless otherwise stated, any sediment or other constituents suspended or dissolved in the water) that passes a cross section in a stream channel, canal, pipeline, and so forth, within a given period of time (cubic feet per second). Discharge also can apply to the rate at which constituents, such as suspended sediment, bedload, and dissolved or suspended chemicals, pass through a cross section, in which cases the quantity is expressed as the mass of constituent that passes the cross section in a given period of time (tons per day).

Dissolved refers to that material in a representative water sample that passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal and State agencies that collect water-quality data. Determinations of "dissolved" constituent concentrations are made on sample water that has been filtered.

Dissolved oxygen (DO) is the molecular oxygen (oxygen gas) dissolved in water. The concentration in water is a function of atmospheric pressure, temperature, and dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved-solids concentration. Photosynthesis and respiration by plants commonly cause diurnal variations in dissolved-oxygen concentration in water from some streams.

Dissolved solids concentration in water is the quantity of dissolved material in a sample of water. It is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. In the mathematical calculation, the bicarbonate value, in milligrams per liter, is multiplied by 0.4926 to convert it to carbonate. Alternatively, alkalinity concentration (as mg/L $CaCO_3$) can be converted to carbonate concentration by multiplying by 0.60.

Diversity index (H) (Shannon index) is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = -\sum_{i=1}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n} \ ,$$

where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specific location is that area upstream from the location, measured in a horizontal plane, that has a common outlet at the site for its surface runoff from precipitation that normally drains by gravity into a

stream. Drainage areas given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the Earth's surface that contains a drainage system with a common outlet for its surface runoff. (See "Drainage area")

Dry mass refers to the mass of residue present after drying in an oven at 105 °C, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass. (See also "Ash mass," "Biomass," and "Wet mass")

Dry weight refers to the weight of animal tissue after it has been dried in an oven at 65 ˚C until a constant weight is achieved. Dry weight represents total organic and inorganic matter in the tissue. (See also "Wet weight")

Embeddedness is the degree to which gravel-sized and larger particles are surrounded or enclosed by finer-sized particles. (See also "Substrate embeddedness class")

Enterococcus bacteria commonly are found in the feces of humans and other warmblooded animals. Although some strains are ubiquitous and not related to fecal pollution, the presence of enterococci in water is an indication of fecal pollution and the possible presence of enteric pathogens. Enterococcus bacteria are those bacteria that produce pink to red colonies with black or reddish-brown precipitate after incubation at 41 °C on mE agar (nutrient medium for bacterial growth) and subsequent transfer to EIA medium. Enterococci include *Streptococcus feacalis, Streptococcus feacium, Streptococcus avium,* and their variants. (See also "Bacteria")

EPT Index is the total number of distinct taxa within the insect orders Ephemeroptera, Plecoptera, and Trichoptera. This index summarizes the taxa richness within the aquatic insects that generally are considered pollution sensitive; the index usually decreases with pollution.

Escherichia coli *(E. coli)* are bacteria present in the intestine and feces of warmblooded animals. *E. coli* are a member species of the fecal coliform group of indicator bacteria. In the laboratory, they are defined as those bacteria that produce yellow or yellow-brown colonies on a filter pad saturated with urea substrate broth after primary culturing for 22 to 24 hours at 44.5 ˚C on mTEC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Estimated (E) value of a concentration is reported when an analyte is detected and all criteria for a positive result are met. If the concentration is less than the method detection limit (MDL), an E code will be reported with the value. If the analyte is identified qualitatively as present, but the quantitative determination is substantially more uncertain, the National Water Quality Laboratory will identify the result with an E code even though the measured value is greater than the MDL. A value reported with an E code should be used with caution. When no analyte is detected in a sample, the default reporting value is the MDL preceded by a less than sign (<). For bacteriological data, concentrations are reported as estimated when results are based on non-ideal colony counts.

Euglenoids (*Euglenophyta*) are a group of algae that usually are free-swimming and rarely creeping. They have the ability to grow either photosynthetically in the light or heterotrophically in the dark. (See also "Phytoplankton")

Extractable organic halides (EOX) are organic compounds that contain halogen atoms such as chlorine. These organic compounds are semivolatile and extractable by ethyl acetate from air-dried streambed sediment. The ethyl acetate extract is combusted, and the concentration is determined by microcoulometric determination of the halides formed. The concentration is reported as micrograms of chlorine per gram of the dry weight of the streambed sediment.

Fecal coliform bacteria are present in the intestines or feces of warmblooded animals. They often are used as indicators of the sanitary quality of the water. In the laboratory, they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5 °C plus or minus 0.2 °C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Fecal streptococcal bacteria are present in the intestines of warmblooded animals and are ubiquitous in the environment. They are characterized as gram-positive, cocci bacteria that are capable of growth in brain-heart infusion broth. In the laboratory, they are defined as all the organisms that produce red or pink colonies within 48 hours at 35 °C plus or minus 1.0 °C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Fire algae (*Pyrrhophyta*) are free-swimming unicells characterized by a red pigment spot. (See also "Phytoplankton")

Flow-duration percentiles are values on a scale of 100 that indicate the percentage of time for which a flow is not exceeded. For example, the 90th percentile of river flow is greater than or equal to 90 percent of all recorded flow rates.

Gage datum is a horizontal surface used as a zero point for measurement of stage or gage height. This surface usually is

located slightly below the lowest point of the stream bottom such that the gage height is usually slightly greater than the maximum depth of water. Because the gage datum is not an actual physical object, the datum is usually defined by specifying the elevations of permanent reference marks such as bridge abutments and survey monuments, and the gage is set to agree with the reference marks. Gage datum is a local datum that is maintained independently of any national geodetic datum. However, if the elevation of the gage datum relative to the national datum (North American Vertical Datum of 1988 or National Geodetic Vertical Datum of 1929) has been determined, then the gage readings can be converted to elevations above the national datum by adding the elevation of the gage datum to the gage reading.

Gage height (G.H.) is the water-surface elevation, in feet above the gage datum. If the water surface is below the gage datum, the gage height is negative. Gage height often is used interchangeably with the more general term "stage," although gage height is more appropriate when used in reference to a reading on a gage.

Gage values are values that are recorded, transmitted, and/or computed from a gaging station. Gage values typically are collected at 5-, 15-, or 30-minute intervals.

Gaging station is a site on a stream, canal, lake, or reservoir where systematic observations of stage, discharge, or other hydrologic data are obtained.

Gas chromatography/flame ionization detector (GC/FID) is a laboratory analytical method used as a screening technique for semivolatile organic compounds that are extractable from water in methylene chloride.

Geomorphic channel units, as used in this report, are fluvial geomorphic descriptors of channel shape and stream velocity. Pools, riffles, and runs are types of geomorphic channel units considered for National Water-Quality Assessment (NAWQA) Program habitat sampling.

Green algae *(Chlorophyta)* are unicellular or colonial algae with chlorophyll pigments similar to those in terrestrial green plants. Some forms of green algae produce mats or floating "moss" in lakes. The abundance of green algae in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter (μm^3/mL). The abundance of green algae in periphyton samples is given in cells per square centimeter (cells/cm^2) or biovolume per square centimeter ($\mu m^3/cm^2$). (See also "Phytoplankton" and "Periphyton")

Habitat, as used in this report, includes all nonliving (physical) aspects of the aquatic ecosystem, although living components like aquatic macrophytes and riparian vegetation also are usually included. Measurements of habitat typically are made over a wider geographic scale than are measurements of species distribution.

Habitat quality index is the qualitative description (level 1) of instream habitat and riparian conditions surrounding the reach sampled. Scores range from 0 to 100 percent with higher scores indicative of desirable habitat conditions for aquatic life. Index only applicable to wadable streams.

Hardness of water is a physical-chemical characteristic that commonly is recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations (primarily calcium and magnesium) and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

High tide is the maximum height reached by each rising tide. The high-high and low-high tides are the higher and lower of the two high tides, respectively, of each tidal day. *See NOAA Web site: http://www.co-ops.nos.noaa.gov/tideglos.html*

Hilsenhoff's Biotic Index (HBI) is an indicator of organic pollution that uses tolerance values to weight taxa abundances; usually increases with pollution. It is calculated as follows:

$$HBI = sum\frac{(n)(a)}{N} ,$$

where n is the number of individuals of each taxon, a is the tolerance value of each taxon, and N is the total number of organisms in the sample.

Horizontal datum (See "Datum")

Hydrologic index stations referred to in this report are continuous-record gaging stations that have been selected as representative of streamflow patterns for their respective regions. Station locations are shown on index maps.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the former Office of Water Data Coordination and delineated on the State Hydrologic Unit Maps by the USGS. Each hydrologic unit is identified by an 8-digit number.

Inch (IN., in.), in reference to streamflow, as used in this report, refers to the depth to which the drainage area would be covered with water if all of the runoff for a given time period were distributed uniformly on it. (See also "Annual runoff")

Instantaneous discharge is the discharge at a particular instant of time. (See also "Discharge")

International Boundary Commission Survey Datum refers to a geodetic datum established at numerous monuments

along the United States-Canada boundary by the International Boundary Commission.

Island, as used in this report, is a mid-channel bar that has permanent woody vegetation, is flooded once a year, on average, and remains stable except during large flood events.

Laboratory reporting level (LRL) generally is equal to twice the yearly determined long-term method detection level (LT-MDL). The LRL controls false negative error. The probability of falsely reporting a nondetection for a sample that contained an analyte at a concentration equal to or greater than the LRL is predicted to be less than or equal to 1 percent. The value of the LRL will be reported with a "less than" (<) remark code for samples in which the analyte was not detected. The National Water Quality Laboratory (NWQL) collects quality-control data from selected analytical methods on a continuing basis to determine LT-MDLs and to establish LRLs. These values are reevaluated annually on the basis of the most current quality-control data and, therefore, may change. The LRL replaces the term 'non-detection value' (NDV).

Land-surface datum (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

Latent heat flux (often used interchangeably with latent heat-flux density) is the amount of heat energy that converts water from liquid to vapor (evaporation) or from vapor to liquid (condensation) across a specified cross-sectional area per unit time. Usually expressed in watts per square meter.

Light-attenuation coefficient, also known as the extinction coefficient, is a measure of water clarity. Light is attenuated according to the Lambert-Beer equation:

$$I = I_o e^{-\lambda L} ,$$

where I_o is the source light intensity, I is the light intensity at length L (in meters) from the source, λ is the light-attenuation coefficient, and e is the base of the natural logarithm. The light-attenuation coefficient is defined as

$$\lambda = -\frac{1}{L}\log_e \frac{I}{I_o} .$$

Lipid is any one of a family of compounds that are insoluble in water and that make up one of the principal components of living cells. Lipids include fats, oils, waxes, and steroids. Many environmental contaminants such as organochlorine pesticides are lipophilic.

Long-term method detection level (LT-MDL) is a detection level derived by determining the standard deviation of a minimum of 24 method detection limit (MDL) spike-sample measurements over an extended period of time. LT-MDL data are collected on a continuous basis to assess year-to-year variations in the LT-MDL. The LT-MDL controls false positive error. The chance of falsely reporting a concentration at or greater than the LT-MDL for a sample that did not contain the analyte is predicted to be less than or equal to 1 percent.

Low tide is the minimum height reached by each falling tide. The high-low and low-low tides are the higher and lower of the two low tides, respectively, of each tidal day. *See NOAA Web site: http://www.co-ops.nos.noaa.gov/tideglos.html*

Macrophytes are the macroscopic plants in the aquatic environment. The most common macrophytes are the rooted vascular plants that usually are arranged in zones in aquatic ecosystems and restricted in the area by the extent of illumination through the water and sediment deposition along the shoreline.

Mean concentration of suspended sediment (Daily mean suspended-sediment concentration) is the time-weighted concentration of suspended sediment passing a stream cross section during a given time period. (See also "Daily mean suspended-sediment concentration" and "Suspended-sediment concentration")

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period. (See also "Discharge")

Mean high or **low tide** is the average of all high or low tides, respectively, over a specific period.

Mean sea level is a local tidal datum. It is the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; for example, monthly mean sea level and yearly mean sea level. In order that they may be recovered when needed, such datums are referenced to fixed points known as benchmarks. (See also "Datum")

Measuring point (MP) is an arbitrary permanent reference point from which the distance to water surface in a well is measured to obtain water level.

Megahertz is a unit of frequency. One megahertz equals one million cycles per second.

Membrane filter is a thin microporous material of specific pore size used to filter bacteria, algae, and other very small particles from water.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the imma-

ture stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99-percent confidence that the analyte concentration is greater than zero. It is determined from the analysis of a sample in a given matrix containing the analyte. At the MDL concentration, the risk of a false positive is predicted to be less than or equal to 1 percent.

Method of Cubatures is a method of computing discharge in tidal estuaries based on the conservation of mass equation.

Methylene blue active substances (MBAS) indicate the presence of detergents (anionic surfactants). The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

Micrograms per gram (UG/G, µg/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per kilogram (UG/KG, µg/kg) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the constituent per unit mass (kilogram) of the material analyzed. One microgram per kilogram is equivalent to 1 part per billion.

Micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in water as mass (micrograms) of constituent per unit volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter. One microgram per liter is equivalent to 1 part per billion.

Microsiemens per centimeter (US/CM, µS/cm) is a unit expressing the amount of electrical conductivity of a solution as measured between opposite faces of a centimeter cube of solution at a specified temperature. Siemens is the International System of Units nomenclature. It is synonymous with mhos and is the reciprocal of resistance in ohms.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in water as the mass (milligrams) of constituent per unit volume (liter) of water. Concentration of suspended sediment also is expressed in milligrams per liter and is based on the mass of dry sediment per liter of water-sediment mixture.

Minimum reporting level (MRL) is the smallest measured concentration of a constituent that may be reliably reported by using a given analytical method.

Miscellaneous site, miscellaneous station, or miscellaneous sampling site is a site where streamflow, sediment, and/or water-quality data or water-quality or sediment samples are collected once, or more often on a random or discontinuous basis to provide better areal coverage for defining hydrologic and water-quality conditions over a broad area in a river basin.

Most probable number (MPN) is an index of the number of coliform bacteria that, more probably than any other number, would give the results shown by the laboratory examination; it is not an actual enumeration. MPN is determined from the distribution of gas-positive cultures among multiple inoculated tubes.

Multiple-plate samplers are artificial substrates of known surface area used for obtaining benthic invertebrate samples. They consist of a series of spaced, hardboard plates on an eyebolt.

Nanograms per liter (NG/L, ng/L) is a unit expressing the concentration of chemical constituents in solution as mass (nanograms) of solute per unit volume (liter) of water. One million nanograms per liter is equivalent to 1 milligram per liter.

National Geodetic Vertical Datum of 1929 (NGVD 29) is a fixed reference adopted as a standard geodetic datum for elevations determined by leveling. It formerly was called "Sea Level Datum of 1929" or "mean sea level." Although the datum was derived from the mean sea level at 26 tide stations**,** it does not necessarily represent local mean sea level at any particular place. *See NOAA Web site: http://www.ngs.noaa.gov/faq.shtml#WhatVD29VD88* (See "North American Vertical Datum of 1988")

Natural substrate refers to any naturally occurring immersed or submersed solid surface, such as a rock or tree, upon which an organism lives. (See also "Substrate")

Nekton are the consumers in the aquatic environment and consist of large, free-swimming organisms that are capable of sustained, directed mobility.

Nephelometric turbidity unit (NTU) is the measurement for reporting turbidity that is based on use of a standard suspension of formazin. Turbidity measured in NTU uses nephelometric methods that depend on passing specific light of a specific wavelength through the sample.

North American Datum of 1927 (NAD 27) is the horizontal control datum for the United States that was defined by a location and azimuth on the Clarke spheroid of 1866.

North American Datum of 1983 (NAD 83) is the horizontal control datum for the United States, Canada, Mexico, and

Central America that is based on the adjustment of 250,000 points including 600 satellite Doppler stations that constrain the system to a geocentric origin. NAD 83 has been officially adopted as the legal horizontal datum for the United States by the Federal government.

North American Vertical Datum of 1988 (NAVD 88) is a fixed reference adopted as the official civilian vertical datum for elevations determined by Federal surveying and mapping activities in the United States. This datum was established in 1991 by minimum-constraint adjustment of the Canadian**,** Mexican, and United States first-order terrestrial leveling networks.

Open or **screened interval** is the length of unscreened opening or of well screen through which water enters a well, in feet below land surface.

Organic carbon (OC) is a measure of organic matter present in aqueous solution, suspension, or bottom sediment. May be reported as dissolved organic carbon (DOC), particulate organic carbon (POC), or total organic carbon (TOC).

Organic mass or **volatile mass** of a living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. Organic mass is expressed in the same units as for ash mass and dry mass. (See also "Ash mass," "Biomass," and "Dry mass")

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meter (m^2), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Organochlorine compounds are any chemicals that contain carbon and chlorine. Organochlorine compounds that are important in investigations of water, sediment, and biological quality include certain pesticides and industrial compounds.

Parameter code is a 5-digit number used in the USGS computerized data system, National Water Information System (NWIS), to uniquely identify a specific constituent or property.

Partial-record station is a site where discrete measurements of one or more hydrologic parameters are obtained over a period of time without continuous data being recorded or computed. A common example is a crest-stage gage partial-record station at which only peak stages and flows are recorded.

Particle size is the diameter, in millimeters (mm), of a particle determined by sieve or sedimentation methods. The sedimentation method uses the principle of Stokes Law to calculate sediment particle sizes. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube, sedigraph) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification, as used in this report, agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay	>0.00024 - 0.004	Sedimentation
Silt	>0.004 - 0.062	Sedimentation
Sand	>0.062 - 2.0	Sedimentation/sieve
Gravel	>2.0 - 64.0	Sieve
Cobble	>64 - 256	Manual measurement
Boulder	>256	Manual measurement

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. For the sedimentation method, most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native water analysis.

Peak flow (peak stage) is an instantaneous local maximum value in the continuous time series of streamflows or stages, preceded by a period of increasing values and followed by a period of decreasing values. Several peak values ordinarily occur in a year. The maximum peak value in a year is called the annual peak; peaks lower than the annual peak are called secondary peaks. Occasionally, the annual peak may not be the maximum value for the year; in such cases, the maximum value occurs at midnight at the beginning or end of the year, on the recession from or rise toward a higher peak in the adjoining year. If values are recorded at a discrete series of times, the peak recorded value may be taken as an approximation of the true peak, which may occur between the recording instants. If the values are recorded with finite precision, a sequence of equal recorded values may occur at the peak; in this case, the first value is taken as the peak.

Percent composition or **percent of total** is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, weight, mass, or volume.

Percent shading is a measure of the amount of sunlight potentially reaching the stream. A clinometer is used to measure left and right bank canopy angles. These values are added together, divided by 180, and multiplied by 100 to compute percentage of shade.

Periodic-record station is a site where stage, discharge, sediment, chemical, physical, or other hydrologic measurements are made one or more times during a year but at a frequency insufficient to develop a daily record.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. Although primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton are useful indicators of water quality.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

pH of water is the negative logarithm of the hydrogen-ion activity. Solutions with pH less than 7.0 standard units are termed "acidic," and solutions with a pH greater than 7.0 are termed "basic." Solutions with a pH of 7.0 are neutral. The presence and concentration of many dissolved chemical constituents found in water are affected, in part, by the hydrogen-ion activity of water. Biological processes including growth, distribution of organisms, and toxicity of the water to organisms also are affected, in part, by the hydrogen-ion activity of water.

Phytoplankton is the plant part of the plankton. They usually are microscopic, and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment and commonly are known as algae. (See also "Plankton")

Picocurie (PC, pCi) is one-trillionth (1×10^{-12}) of the amount of radioactive nuclide represented by a curie (Ci). A curie is the quantity of radioactive nuclide that yields 3.7×10^{10} radioactive disintegrations per second (dps). A picocurie yields 0.037 dps, or 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers. Concentrations are expressed as a number of cells per milliliter (cells/mL) of sample.

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Polychlorinated naphthalenes (PCNs) are industrial chemicals that are mixtures of chlorinated naphthalene compounds. They have properties and applications similar to polychlorinated biphenyls (PCBs) and have been identified in commercial PCB preparations.

Pool, as used in this report, is a small part of a stream reach with little velocity, commonly with water deeper than surrounding areas.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated (carbon method) by the plants.

Primary productivity (carbon method) is expressed as milligrams of carbon per area per unit time [mg C/(m^2/time)] for periphyton and macrophytes or per volume [mg C/(m^3/time)] for phytoplankton. The carbon method defines the amount of carbon dioxide consumed as measured by radioactive carbon (carbon-14). The carbon-14 method is of greater sensitivity than the oxygen light- and dark-bottle method and is preferred for use with unenriched water samples. Unit time may be either the hour or day, depending on the incubation period. (See also "Primary productivity")

Primary productivity (oxygen method) is expressed as milligrams of oxygen per area per unit time [mg O/(m^2/time)] for periphyton and macrophytes or per volume [mg O/(m^3/time)] for phytoplankton. The oxygen method defines production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light- and dark-bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period. (See also "Primary productivity")

Radioisotopes are isotopic forms of elements that exhibit radioactivity. Isotopes are varieties of a chemical element that differ in atomic weight but are very nearly alike in chemical properties. The difference arises because the atoms of the isotopic forms of an element differ in the number of neutrons in the nucleus; for example, ordinary chlorine is a mixture of isotopes having atomic weights of 35 and 37, and the natural mixture has an atomic weight of about 35.453. Many of the elements similarly exist as mixtures of isotopes, and a great many new isotopes have been produced in the operation of nuclear devices such as the cyclotron. There are 275 isotopes

of the 81 stable elements, in addition to more than 800 radioactive isotopes.

Reach, as used in this report, is a length of stream that is chosen to represent a uniform set of physical, chemical, and biological conditions within a segment. It is the principal sampling unit for collecting physical, chemical, and biological data.

Recoverable from bed (bottom) material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. (See also "Bed material")

Recurrence interval, also referred to as return period, is the average time, usually expressed in years, between occurrences of hydrologic events of a specified type (such as exceedances of a specified high flow or nonexceedance of a specified low flow). The terms "return period" and "recurrence interval" do not imply regular cyclic occurrence. The actual times between occurrences vary randomly, with most of the times being less than the average and a few being substantially greater than the average. For example, the 100-year flood is the flow rate that is exceeded by the annual maximum peak flow at intervals whose average length is 100 years (that is, once in 100 years, on average); almost two-thirds of all exceedances of the 100-year flood occur less than 100 years after the previous exceedance, half occur less than 70 years after the previous exceedance, and about one-eighth occur more than 200 years after the previous exceedance. Similarly, the 7-day, 10-year low flow ($7Q_{10}$) is the flow rate below which the annual minimum 7-day-mean flow dips at intervals whose average length is 10 years (that is, once in 10 years, on average); almost two-thirds of the nonexceedances of the $7Q_{10}$ occur less than 10 years after the previous nonexceedance, half occur less than 7 years after, and about one-eighth occur more than 20 years after the previous nonexceedance. The recurrence interval for annual events is the reciprocal of the annual probability of occurrence. Thus, the 100-year flood has a 1-percent chance of being exceeded by the maximum peak flow in any year, and there is a 10-percent chance in any year that the annual minimum 7-day-mean flow will be less than the $7Q_{10}$.

Replicate samples are a group of samples collected in a manner such that the samples are thought to be essentially identical in composition.

Return period (See "Recurrence interval")

Riffle, as used in this report, is a shallow part of the stream where water flows swiftly over completely or partially submerged obstructions to produce surface agitation.

River mileage is the curvilinear distance, in miles, measured upstream from the mouth along the meandering path of a stream channel in accordance with Bulletin No. 14 (October 1968) of the Water Resources Council and typically is used to denote location along a river.

Run, as used in this report, is a relatively shallow part of a stream with moderate velocity and little or no surface turbulence.

Runoff is the quantity of water that is discharged ("runs off") from a drainage basin during a given time period. Runoff data may be presented as volumes in acre-feet, as mean discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches. (See also "Annual runoff")

Sea level, as used in this report, refers to one of the two commonly used national vertical datums (NGVD 1929 or NAVD 1988). See separate entries for definitions of these datums.

Sediment is solid material that originates mostly from disintegrated rocks; when transported by, suspended in, or deposited from water, it is referred to as "fluvial sediment." Sediment includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are affected by environmental and land-use factors. Some major factors are topography, soil characteristics, land cover, and depth and intensity of precipitation.

Sensible heat flux (often used interchangeably with latent sensible heat-flux density) is the amount of heat energy that moves by turbulent transport through the air across a specified cross-sectional area per unit time and goes to heating (cooling) the air. Usually expressed in watts per square meter.

Seven-day, 10-year low flow ($7Q_{10}$) is the discharge below which the annual 7-day minimum flow falls in 1 year out of 10 on the long-term average. The recurrence interval of the $7Q_{10}$ is 10 years; the chance that the annual 7-day minimum flow will be less than the $7Q_{10}$ is 10 percent in any given year. (See also "Annual 7-day minimum" and "Recurrence interval")

Shelves, as used in this report, are streambank features extending nearly horizontally from the flood plain to the lower limit of persistent woody vegetation.

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Sodium hazard in water is an index that can be used to evaluate the suitability of water for irrigating crops.

Soil heat flux (often used interchangeably with soil heat-flux density) is the amount of heat energy that moves by conduction across a specified cross-sectional area of soil per unit time and goes to heating (or cooling) the soil. Usually expressed in watts per square meter.

Soil-water content is the water lost from the soil upon drying to constant mass at 105 °C; expressed either as mass of water per unit mass of dry soil or as the volume of water per unit bulk volume of soil.

Specific electrical conductance (conductivity) is a measure of the capacity of water (or other media) to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 °C. Specific electrical conductance is a function of the types and quantity of dissolved substances in water and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stable isotope ratio (per MIL) is a unit expressing the ratio of the abundance of two radioactive isotopes. Isotope ratios are used in hydrologic studies to determine the age or source of specific water, to evaluate mixing of different water, as an aid in determining reaction rates, and other chemical or hydrologic processes.

Stage (See "Gage height")

Stage-discharge relation is the relation between the water-surface elevation, termed stage (gage height), and the volume of water flowing in a channel per unit time.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Substrate embeddedness class is a visual estimate of riffle streambed substrate larger than gravel that is surrounded or covered by fine sediment (<2 mm, sand or finer). Below are the class categories expressed as the percentage covered by fine sediment:

0	no gravel or larger substrate	3	26-50 percent
1	> 75 percent	4	5-25 percent
2	51-75 percent	5	< 5 percent

Surface area of a lake is that area (acres) encompassed by the boundary of the lake as shown on USGS topographic maps, or other available maps or photographs. Because surface area changes with lake stage, surface areas listed in this report represent those determined for the stage at the time the maps or photographs were obtained.

Surficial bed material is the upper surface (0.1 to 0.2 foot) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Surrogate is an analyte that behaves similarly to a target analyte, but that is highly unlikely to occur in a sample. A surrogate is added to a sample in known amounts before extraction and is measured with the same laboratory procedures used to measure the target analyte. Its purpose is to monitor method performance for an individual sample.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is defined operationally as the material retained on a 0.45-micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative suspended water-sediment sample that is retained on a 0.45-micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment, and, thus, the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. Determinations of "suspended, recoverable" constituents are made either by directly analyzing the suspended mate-rial collected on the filter or, more commonly, by difference, on the basis of determinations of (1) dissolved and (2) total recoverable concentrations of the constituent. (See also "Suspended")

Suspended sediment is the sediment maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid. (See also "Sediment")

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 foot above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L). The analytical technique uses the mass of all of the sediment and the net weight of the water-sediment mixture in a sample to compute the suspended-sediment concentration. (See also "Sediment" and "Suspended sediment")

Suspended-sediment discharge (tons/d) is the rate of sediment transport, as measured by dry mass or volume, that passes a cross section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft^3/s) x 0.0027. (See also "Sediment," "Suspended sediment," and "Suspended-sediment concentration")

Suspended-sediment load is a general term that refers to a given characteristic of the material in suspension that passes a point during a specified period of time. The term needs to be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It is not synonymous with either suspended-sediment discharge or concentration. (See also "Sediment")

Suspended solids, total residue at 105 °C concentration is the concentration of inorganic and organic material retained on a filter, expressed as milligrams of dry material per liter of water (mg/L). An aliquot of the sample is used for this analysis.

Suspended, total is the total amount of a given constituent in the part of a water-sediment sample that is retained on a 0.45-micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. Knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total." Determinations of "suspended, total" constituents are made either by directly analyzing portions of the suspended material collected on the filter or, more commonly, by difference, on the basis of determinations of (1) dissolved and (2) total concentrations of the constituent. (See also "Suspended")

Synoptic studies are short-term investigations of specific water-quality conditions during selected seasonal or hydrologic periods to provide improved spatial resolution for critical water-quality conditions. For the period and conditions sampled, they assess the spatial distribution of selected water-quality conditions in relation to causative factors, such as land use and contaminant sources.

Taxa (Species) richness is the number of species (taxa) present in a defined area or sampling unit.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchial scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, *Hexagenia limbata,* is the following:

Kingdom:	Animal
Phylum:	Arthropeda
Class:	Insecta
Order:	Ephemeroptera
Family:	Ephemeridae
Genus:	*Hexagenia*
Species:	*Hexagenia limbata*

Thalweg is the line formed by connecting points of minimum streambed elevation (deepest part of the channel).

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table descriptions and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water resulting from the mixing of flow proportionally to the duration of the concentration.

Tons per acre-foot (T/acre-ft) is the dry mass (tons) of a constituent per unit volume (acre-foot) of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY, tons/d) is a common chemical or sediment discharge unit. It is the quantity of a substance in solution, in suspension, or as bedload that passes a stream section during a 24-hour period. It is equivalent to 2,000 pounds per day, or 0.9072 metric ton per day.

Total is the amount of a given constituent in a representative whole-water (unfiltered) sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the

analytical method determined at least 95 percent of the constituent in the sample.)

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. This group includes coliforms that inhabit the intestine of warm-blooded animals and those that inhabit soils. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas formation within 48 hours at 35 °C. In the laboratory, these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35 °C plus or minus 1.0 °C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliters of sample. (See also "Bacteria")

Total discharge is the quantity of a given constituent, measured as dry mass or volume, that passes a stream cross section per unit of time. When referring to constituents other than water, this term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total in bottom material is the amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total in bottom material."

Total length (fish) is the straight-line distance from the anterior point of a fish specimen's snout, with the mouth closed, to the posterior end of the caudal (tail) fin, with the lobes of the caudal fin squeezed together.

Total load refers to all of a constituent in transport. When referring to sediment, it includes suspended load plus bed load.

Total organism count is the number of organisms collected and enumerated in any particular sample. (See also "Organism count/volume")

Total recoverable is the amount of a given constituent in a whole-water sample after a sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data for whole-water samples, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures may produce different analytical results.

Total sediment discharge is the mass of suspended-sediment plus bed-load transport, measured as dry weight, that passes a cross section in a given time. It is a rate and is reported as tons per day. (See also "Bedload," "Bedload discharge," "Sediment," "Suspended sediment," and "Suspended-sediment concentration")

Total sediment load or **total load** is the sediment in transport as bedload and suspended-sediment load. The term may be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It differs from total sediment discharge in that load refers to the material, whereas discharge refers to the quantity of material, expressed in units of mass per unit time. (See also "Sediment," "Suspended-sediment load," and "Total load")

Transect, as used in this report, is a line across a stream perpendicular to the flow and along which measurements are taken, so that morphological and flow characteristics along the line are described from bank to bank. Unlike a cross section, no attempt is made to determine known elevation points along the line.

Turbidity is the reduction in the transparency of a solution because of the presence of suspended and some dissolved substances. The measurement technique records the collective optical properties of the solution that cause light to be scattered and attenuated rather than transmitted in straight lines; the higher the intensity of scattered or attenuated light, the higher the value of the turbidity. Turbidity is expressed in nephelometric turbidity units (NTU). Depending on the method used, the turbidity units as NTU can be defined as the intensity of light of a specified wavelength scattered or attenuated by suspended particles or absorbed at a method specified angle, usually 90 degrees, from the path of the incident light. Currently approved methods for the measurement of turbidity in the USGS include those that conform to USEPA Method 180.1, ASTM D1889-00, and ISO 7027. Measurements of turbidity by these different methods and different instruments are unlikely to yield equivalent values.

Ultraviolet (UV) absorbance (absorption) at 254 or 280 nanometers is a measure of the aggregate concentration of the mixture of UV absorbing organic materials dissolved in the analyzed water, such as lignin, tannin, humic substances, and various aromatic compounds. UV absorbance (absorption) at 254 or 280 nanometers is measured in UV absorption units per centimeter of path length of UV light through a sample.

Unconfined aquifer is an aquifer whose upper surface is a water table free to fluctuate under atmospheric pressure. (See "Water-table aquifer")

Vertical datum (See "Datum")

Volatile organic compounds (VOCs) are organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas, such as helium, and, subsequently, analyzed by gas chromatography. Many VOCs are human-made chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They often are components of fuels, solvents, hydraulic fluids, paint thinners, and dry-cleaning agents commonly used in urban settings. VOC contamination of drinking-water supplies is a human-health concern because many are toxic and are known or suspected human carcinogens.

Water table is that surface in a ground-water body at which the water pressure is equal to the atmospheric pressure.

Water-table aquifer is an unconfined aquifer within which the water table is found.

Water year in USGS reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 2002, is called the "2002 water year."

Watershed (See "Drainage basin")

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports. (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976.)

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

Wet mass is the mass of living matter plus contained water. (See also "Biomass" and "Dry mass")

Wet weight refers to the weight of animal tissue or other substance including its contained water. (See also "Dry weight")

WSP is used as an acronym for "Water-Supply Paper" in reference to previously published reports.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and often are large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers. (See also "Plankton")

Techniques of Water-Resources Investigations of the U.S. Geological Survey

The USGS publishes a series of manuals, the Techniques of Water-Resources Investigations, describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, section A of book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

Reports in the Techniques of Water-Resources Investigations series, which are listed below, are online at *http://water.usgs.gov/pubs/twri/*. Printed copies are for sale by the USGS, Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office), telephone 1-888-ASK-USGS. Please telephone 1-888-ASK-USGS for current prices, and refer to the title, book number, chapter number, and mention the "U.S. Geological Survey Techniques of Water-Resources Investigations." Products can then be ordered by telephone, or online at http://www.usgs.gov/sales.html, or by FAX to (303)236-469 of an order form available online at *http://mac.usgs.gov/isb/pubs/forms/*. Prepayment by major credit card or by a check or money order payable to the "U.S. Geological Survey" is required.

Book 1. Collection of Water Data by Direct Measurement

Section D. Water Quality

1–D1.*Water temperature—Influential factors, field measurement, and data presentation*, by H.H. Stevens, Jr., J.F. Ficke, and G.F. Smoot: USGS–TWRI book 1, chap. D1. 1975. 65 p.
1–D2.*Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W.W. Wood: USGS–TWRI book 1, chap. D2. 1976. 24 p.

Book 2. Collection of Environmental Data

Section D. Surface Geophysical Methods

2–D1.*Application of surface geophysics to ground-water investigations,* by A.A.R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS–TWRI book 2, chap. D1. 1974. 116 p.
2–D2.*Application of seismic-refraction techniques to hydrologic studies,* by F.P. Haeni: USGS–TWRI book 2, chap. D2. 1988. 86 p.

Section E. Subsurface Geophysical Methods

2–E1.*Application of borehole geophysics to water-resources investigations,* by W.S. Keys and L.M. MacCary: USGS–TWRI book 2, chap. E1. 1971. 126 p.
2–E2.*Borehole geophysics applied to ground-water investigations,* by W.S. Keys: USGS–TWRI book 2, chap. E2. 1990. 150 p.

Section F. Drilling and Sampling Methods

2–F1.*Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W.E. Teasdale: USGS–TWRI book 2, chap. F1. 1989. 97 p.

Book 3. Applications of Hydraulics

Section A. Surface-Water Techniques

3–A1.*General field and office procedures for indirect discharge measurements,* by M.A. Benson and Tate Dalrymple: USGS–TWRI book 3, chap. A1. 1967. 30 p.
3–A2.*Measurement of peak discharge by the slope-area method,* by Tate Dalrymple and M.A. Benson: USGS–TWRI book 3, chap. A2. 1967. 12 p.
3–A3.*Measurement of peak discharge at culverts by indirect methods,* by G.L. Bodhaine: USGS–TWRI book 3, chap. A3. 1968. 60 p.
3–A4.*Measurement of peak discharge at width contractions by indirect methods,* by H.F. Matthai: USGS-TWRI book 3, chap. A4. 1967. 44 p.
3–A5.*Measurement of peak discharge at dams by indirect methods,* by Harry Hulsing: USGS–TWRI book 3, chap. A5. 1967. 29 p.
3–A6.*General procedure for gaging streams,* by R.W. Carter and Jacob Davidian: USGS–TWRI book 3, chap. A6. 1968. 13 p.
3–A7.*Stage measurement at gaging stations,* by T.J. Buchanan and W.P. Somers: USGS–TWRI book 3, chap. A7. 1968. 28 p.
3–A8.*Discharge measurements at gaging stations,* by T.J. Buchanan and W.P. Somers: USGS–TWRI book 3, chap. A8. 1969. 65 p.
3–A9.*Measurement of time of travel in streams by dye tracing,* by F.A. Kilpatrick and J.F. Wilson, Jr.: USGS–TWRI book 3, chap. A9. 1989. 27 p.
3–Al0.*Discharge ratings at gaging stations,* by E.J. Kennedy: USGS–TWRI book 3, chap. A10. 1984. 59 p.
3–A11.*Measurement of discharge by the moving-boat method,* by G.F. Smoot and C.E. Novak: USGS–TWRI book 3, chap. A11. 1969. 22 p.
3–A12.*Fluorometric procedures for dye tracing*, Revised, by J.F. Wilson, Jr., E.D. Cobb, and F.A. Kilpatrick: USGS–TWRI book 3, chap. A12. 1986. 34 p.
3–A13.*Computation of continuous records of streamflow*, by E.J. Kennedy: USGS–TWRI book 3, chap. A13. 1983. 53 p.
3–A14.*Use of flumes in measuring discharge,* by F.A. Kilpatrick and V.R. Schneider: USGS–TWRI book 3, chap. A14. 1983. 46 p.
3–A15.*Computation of water-surface profiles in open channels,* by Jacob Davidian: USGS–TWRI book 3, chap. A15. 1984. 48 p.
3–A16.*Measurement of discharge using tracers*, by F.A. Kilpatrick and E.D. Cobb: USGS–TWRI book 3, chap. A16. 1985. 52 p.
3–A17.*Acoustic velocity meter systems,* by Antonius Laenen: USGS–TWRI book 3, chap. A17. 1985. 38 p.
3–A18.*Determination of stream reaeration coefficients by use of tracers,* by F.A. Kilpatrick, R.E. Rathbun, Nobuhiro Yotsukura, G.W. Parker, and L.L. DeLong: USGS–TWRI book 3, chap. A18. 1989. 52 p.
3–A19.*Levels at streamflow gaging stations*, by E.J. Kennedy: USGS–TWRI book 3, chap. A19. 1990. 31 p.
3–A20.*Simulation of soluble waste transport and buildup in surface waters using tracers*, by F.A. Kilpatrick: USGS–TWRI book 3, chap. A20. 1993. 38 p.
3–A21*Stream-gaging cableways,* by C. Russell Wagner: USGS–TWRI book 3, chap. A21. 1995. 56 p.

Section B. Ground-Water Techniques

3–B1. *Aquifer-test design, observation, and data analysis,* by R.W. Stallman: USGS–TWRI book 3, chap. B1. 1971. 26 p.
3–B2.*Introduction to ground-water hydraulics, a programed text for self-instruction*, by G.D. Bennett: USGS–TWRI book 3, chap. B2. 1976. 172 p.
3–B3.*Type curves for selected problems of flow to wells in confined aquifers*, by J.E. Reed: USGS–TWRI book 3, chap. B3. 1980. 106 p.
3–B4.*Regression modeling of ground-water flow,* by R.L. Cooley and R.L. Naff: USGS–TWRI book 3, chap. B4. 1990. 232 p.
3–B4.*Supplement 1. Regression modeling of ground-water flow—Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems,* by R.L. Cooley: USGS–TWRI book 3, chap. B4. 1993. 8 p.
3–B5.*Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems—An introduction*,

by O.L. Franke, T.E. Reilly, and G.D. Bennett: USGS–TWRI book 3, chap. B5. 1987. 15 p.
3–B6.*The principle of superposition and its application in ground-water hydraulics,* by T.E. Reilly, O.L. Franke, and G.D. Bennett: USGS–TWRI book 3, chap. B6. 1987. 28 p.
3–B7.*Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow,* by E.J. Wexler: USGS–TWRI book 3, chap. B7. 1992. 190 p.
3–B8.*System and boundary conceptualization in ground-water flow simulation,* by T.E. Reilly: USGS–TWRI book 3, chap. B8. 2001. 29 p.

Section C. Sedimentation and Erosion Techniques

3–C1.*Fluvial sediment concepts,* by H.P. Guy: USGS–TWRI book 3, chap. C1. 1970. 55 p.
3–C2.*Field methods for measurement of fluvial sediment*, by T.K. Edwards and G.D. Glysson: USGS–TWRI book 3, chap. C2. 1999. 89 p.
3–C3.*Computation of fluvial-sediment discharge,* by George Porterfield: USGS–TWRI book 3, chap. C3. 1972. 66 p.

Book 4. Hydrologic Analysis and Interpretation

Section A. Statistical Analysis

4–A1.*Some statistical tools in hydrology*, by H.C. Riggs: USGS–TWRI book 4, chap. A1. 1968. 39 p.
4–A2.*Frequency curves,* by H.C. Riggs: USGS–TWRI book 4, chap. A2. 1968. 15 p.
4–A3.*Statistical methods in water resources*, by D.R. Helsel and R.M. Hirsch: USGS–TWRI book 4, chap. A3. 1991. Available only online at http://water.usgs.gov/pubs/twri/twri4a3/. (Accessed August 30, 2002.)

Section B. Surface Water

4–B1.*Low-flow investigations,* by H.C. Riggs: USGS–TWRI book 4, chap. B1. 1972. 18 p.
4–B2.*Storage analyses for water supply*, by H.C. Riggs and C.H. Hardison: USGS–TWRI book 4, chap. B2. 1973. 20 p.
4–B3.*Regional analyses of streamflow characteristics,* by H.C. Riggs: USGS–TWRI book 4, chap. B3. 1973.
15 p.

Section D. Interrelated Phases of the Hydrologic Cycle

4–D1.*Computation of rate and volume of stream depletion by wells*, by C.T. Jenkins: USGS–TWRI book 4, chap. D1. 1970. 17 p.

Book 5. Laboratory Analysis

Section A. Water Analysis

5–A1.*Methods for determination of inorganic substances in water and fluvial sediments,* by M.J. Fishman and L.C. Friedman, editors: USGS–TWRI book 5, chap. A1. 1989. 545 p.
5–A2.*Determination of minor elements in water by emission spectroscopy,* by P.R. Barnett and E.C. Mallory, Jr.: USGS–TWRI book 5, chap. A2. 1971. 31 p.
5–A3.*Methods for the determination of organic substances in water and fluvial sediments*, edited by R.L. Wershaw, M.J. Fishman, R.R. Grabbe, and L.E. Lowe: USGS–TWRI book 5, chap. A3. 1987. 80 p.
5–A4.*Methods for collection and analysis of aquatic biological and microbiological samples,* by L.J. Britton and P.E. Greeson, editors: USGS–TWRI book 5, chap. A4. 1989. 363 p.
5–A5.*Methods for determination of radioactive substances in water and fluvial sediments,* by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS–TWRI book 5, chap. A5. 1977. 95 p.
5–A6.*Quality assurance practices for the chemical and biological analyses of water and fluvial sediments,* by L.C. Friedman and D.E. Erdmann: USGS–TWRI book 5, chap. A6. 1982. 181 p.

Section C. Sediment Analysis

5–C1.*Laboratory theory and methods for sediment analysis*, by H.P. Guy: USGS–TWRI book 5, chap. C1. 1969. 58 p.

Book 6. Modeling Techniques

Section A. Ground Water

6–A1.*A modular three-dimensional finite-difference ground-water flow model*, by M.G. McDonald and A.W. Harbaugh: USGS–TWRI book 6, chap. A1. 1988. 586 p.
6–A2.*Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model,* by S.A. Leake and D.E. Prudic: USGS–TWRI book 6, chap. A2. 1991. 68 p.
6–A3.*A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual,* by L.J. Torak: USGS–TWRI book 6, chap. A3. 1993. 136 p.
6–A4.*A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions,* by R.L. Cooley: USGS–TWRI book 6, chap. A4. 1992. 108 p.
6–A5.*A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details,* by L.J. Torak: USGS–TWRI book 6, chap. A5. 1993. 243 p.

6–A6.*A coupled surface-water and ground-water flow model (MODBRANCH) for simulation of stream-aquifer interaction*, by Eric D. Swain and Eliezer J. Wexler: USGS–TWRI book 6, chap. A6. 1996. 125 p.
6–A7.*User's guide to SEAWAT: A computer program for simulation of three-dimensional variable-density ground-water flow*, by Weixing Guo and Christian D. Langevin: USGS–TWRI book 6, chap. A7. 2002.
77 p.

Book 7. Automated Data Processing and Computations

Section C. Computer Programs

7–C1.*Finite difference model for aquifer simulation in two dimensions with results of numerical experiments,* by P.C. Trescott, G.F. Pinder, and S.P. Larson: USGS–TWRI book 7, chap. C1. 1976. 116 p.
7–C2.*Computer model of two-dimensional solute transport and dispersion in ground water*, by L.F. Konikow and J.D. Bredehoeft: USGS–TWRI book 7, chap. C2. 1978. 90 p.
7–C3.*A model for simulation of flow in singular and interconnected channels,* by R.W. Schaffranek, R.A. Baltzer, and D.E. Goldberg: USGS–TWRI book 7, chap. C3. 1981. 110 p.

Book 8. Instrumentation

Section A. Instruments for Measurement of Water Level

8–A1.*Methods of measuring water levels in deep wells,* by M.S. Garber and F.C. Koopman: USGS–TWRI book 8, chap. A1. 1968. 23 p.
8–A2.*Installation and service manual for U.S. Geological Survey manometers*, by J.D. Craig: USGS–TWRI book 8, chap. A2. 1983. 57 p.

Section B. Instruments for Measurement of Discharge

8–B2.*Calibration and maintenance of vertical-axis type current meters,* by G.F. Smoot and C.E. Novak: USGS–TWRI book 8, chap. B2. 1968. 15 p.

Book 9. Handbooks for Water-Resources Investigations

Section A. National Field Manual for the Collection of Water-Quality Data

9–A1.*National field manual for the collection of water-quality data: Preparations for water sampling*, by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A1. 1998. 47 p.
9–A2.*National field manual for the collection of water-quality data: Selection of equipment for water sampling*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A2. 1998. 94 p.
9–A3.*National field manual for the collection of water-quality data: Cleaning of equipment for water sampling*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A3. 1998. 75 p.
9–A4.*National field manual for the collection of water-quality data: Collection of water samples*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A4. 1999. 156 p.
9–A5.*National field manual for the collection of water-quality data: Processing of water samples*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A5. 1999, 149 p.
9–A6.*National field manual for the collection of water-quality data: Field measurements*, edited by F.D. Wilde and D.B. Radtke: USGS–TWRI book 9, chap. A6. 1998. Variously paginated.
9–A7.*National field manual for the collection of water-quality data: Biological indicators*, edited by D.N. Myers and F.D. Wilde: USGS–TWRI book 9, chap. A7. 1997 and 1999. Variously paginated.
9–A8.*National field manual for the collection of water-quality data: Bottom-material samples*, by D.B. Radtke: USGS–TWRI book 9, chap. A8. 1998. 48 p.
9–A9.*National field manual for the collection of water-quality data: Safety in field activities*, by S.L. Lane and R.G. Fay: USGS–TWRI book 9, chap. A9. 1998. 60 p.

Gaging stations, surface water

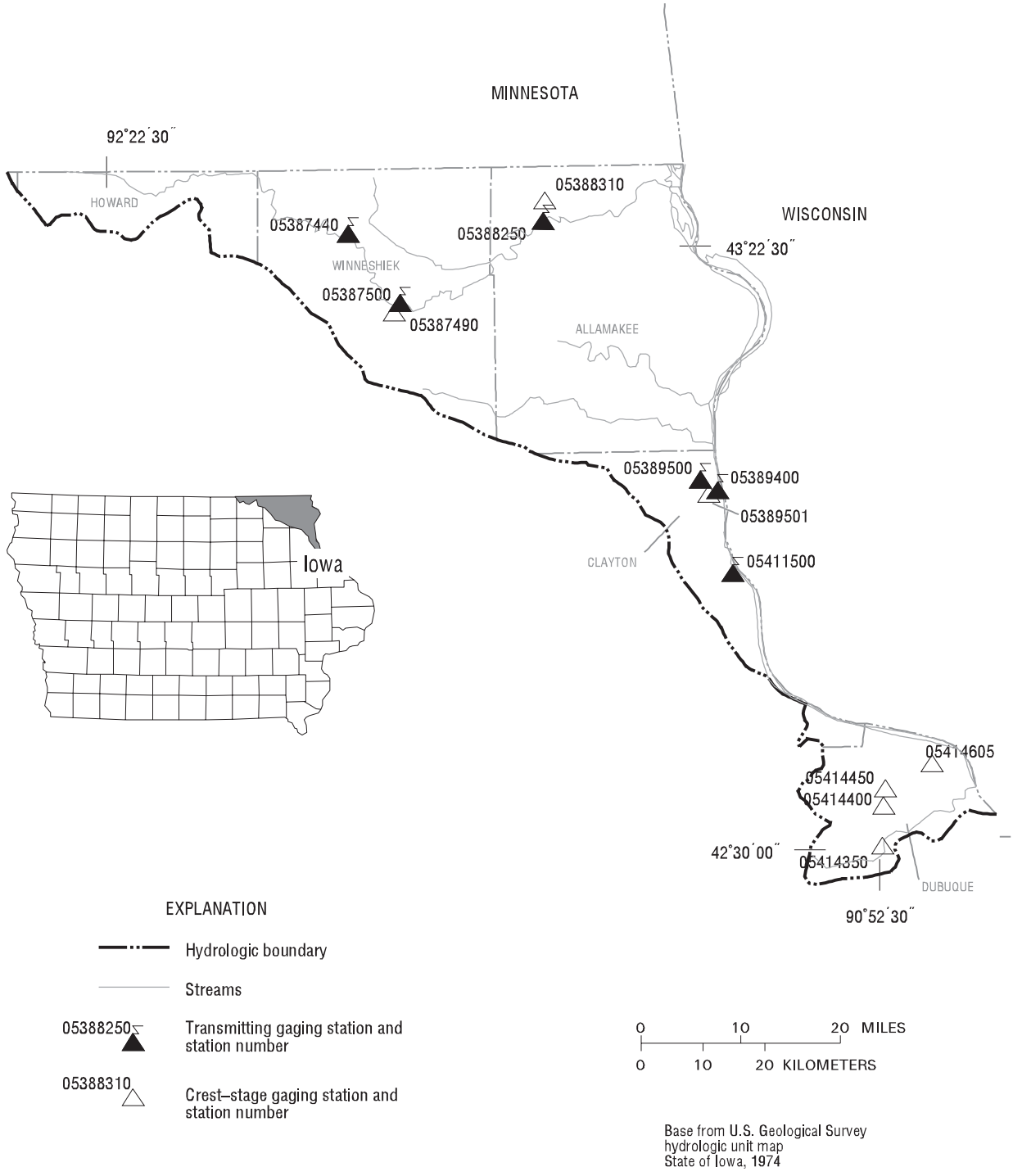


Figure 6. Locations of active continuous-record and crest-stage gaging stations in the Mississippi River drainage basin, (northeast Iowa).

Gaging Stations

05387440 Upper Iowa River at Bluffton, IA. 38
05387500 Upper Iowa River at Decorah, IA. 40
05388250 Upper Iowa River near Dorchester, IA. 42
05389400 Bloody Run Creek near Marquette, IA. 44
05389500 Mississippi River at McGregor, IA 54
05411500 Mississippi River at Clayton, IA 62

Crest Stage Gaging Stations

05387490 Dry Run Creek near Decorah, IA 456
05388310 Waterloo Creek near Dorchester, IA 456
05389501 Mississippi River Tributary at McGregor, IA 456
05414350 Little Maquoketa River near Graf, IA 456
05414400 Middle Fork Little Maquoketa River near Rickardsville, IA 457
05414450 North Fork Little Maquoketa River near Rickardsville, IA 457
05414605 Bloody Run Tributary near Sherrill, IA 457

05387440 UPPER IOWA RIVER AT BLUFFTON, IA

LOCATION.--Lat 43°24'25", long 91°53'56", in SW¼ SW¼ NE¼ sec.10, T.99 N., R.9 W., Winneshiek County, Hydrologic Unit 07060002, on left bank 10 ft downstream of bridge on County Highway W20, 0.5 miles upstream of Silver Creek, and 9.3 mi upstream from Decorah.

DRAINAGE AREA.--367 mi^2.

PERIOD OF RECORD.--September 1957 to July 1977; low-flow measurement site: Stage only records from October 20, 1999 to September 30, 2002: Discharge records from October 1, 2002 to September 30, 2003.

GAGE.--Water-stage recorder. Datum of gage is 945.50 ft. above NGVD of 1929.

REMARKS.--Records good. U.S. Geological Survey satellite and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of March 27, 1961, discharge 20,200 ft^3/s; Flood of June 21, 1954, discharge 13,600 ft^3/s; on basis of peak flow at Decorah gage, downstream 11.0 miles.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	74	e54	e38	e51	e56	102	127	159	231	101	45
2	56	75	e48	e34	e54	e52	89	119	147	201	90	47
3	61	75	e47	e38	e57	e51	76	111	143	187	84	43
4	70	75	e54	e44	e56	e53	69	111	143	168	78	43
5	69	79	e59	e39	e55	e54	65	153	133	165	81	45
6	72	81	e50	e41	e52	e53	63	373	139	163	81	43
7	78	82	e53	e49	e52	e52	67	470	149	186	79	47
8	83	82	e50	e58	e52	e52	71	428	189	258	75	41
9	76	80	e53	e54	e51	e52	66	512	208	304	73	42
10	78	80	e59	e49	e51	e53	72	831	274	302	70	42
11	75	78	e54	e43	e49	e54	85	819	279	323	70	42
12	76	75	e55	e42	e47	e56	91	1,460	254	304	68	46
13	66	74	e52	e42	e49	e57	98	1,220	231	285	67	49
14	69	73	e57	e41	e52	e70	118	818	215	258	66	48
15	68	69	e61	e40	e57	e91	120	690	193	230	63	45
16	78	69	e53	e39	e47	e134	107	731	177	205	62	46
17	82	67	e61	e37	e47	e185	106	616	165	189	62	45
18	80	69	e67	e37	e52	178	114	513	159	169	61	46
19	73	70	e64	e37	e53	141	137	433	142	150	60	53
20	73	74	e56	e37	e60	125	167	374	132	141	61	49
21	78	77	e48	e36	e67	109	178	332	127	131	57	46
22	78	74	e41	e35	e71	99	195	300	121	119	55	49
23	76	74	e37	e35	e68	99	190	283	116	111	51	46
24	79	70	e36	e38	e58	89	178	262	122	104	52	45
25	84	66	e42	e45	e50	75	168	246	128	101	57	41
26	84	e59	e49	e42	e52	75	153	230	162	98	67	42
27	77	e53	e40	e47	e55	89	147	216	252	95	58	41
28	82	e57	e33	e52	e59	103	135	205	272	91	55	42
29	82	e62	e37	e49	---	102	128	193	280	88	56	38
30	80	e59	e40	e48	---	110	125	181	265	87	52	37
31	75	---	e45	e49	---	111	---	168	---	87	50	---
TOTAL	2,316	2,152	1,555	1,315	1,524	2,680	3,480	13,525	5,476	5,531	2,062	1,334
MEAN	74.7	71.7	50.2	42.4	54.4	86.5	116	436	183	178	66.5	44.5
MAX	84	82	67	58	71	185	195	1,460	280	323	101	53
MIN	56	53	33	34	47	51	63	111	116	87	50	37
AC-FT	4,590	4,270	3,080	2,610	3,020	5,320	6,900	26,830	10,860	10,970	4,090	2,650
CFSM	0.20	0.20	0.14	0.12	0.15	0.24	0.32	1.19	0.50	0.49	0.18	0.12
IN.	0.23	0.22	0.16	0.13	0.15	0.27	0.35	1.37	0.56	0.56	0.21	0.14

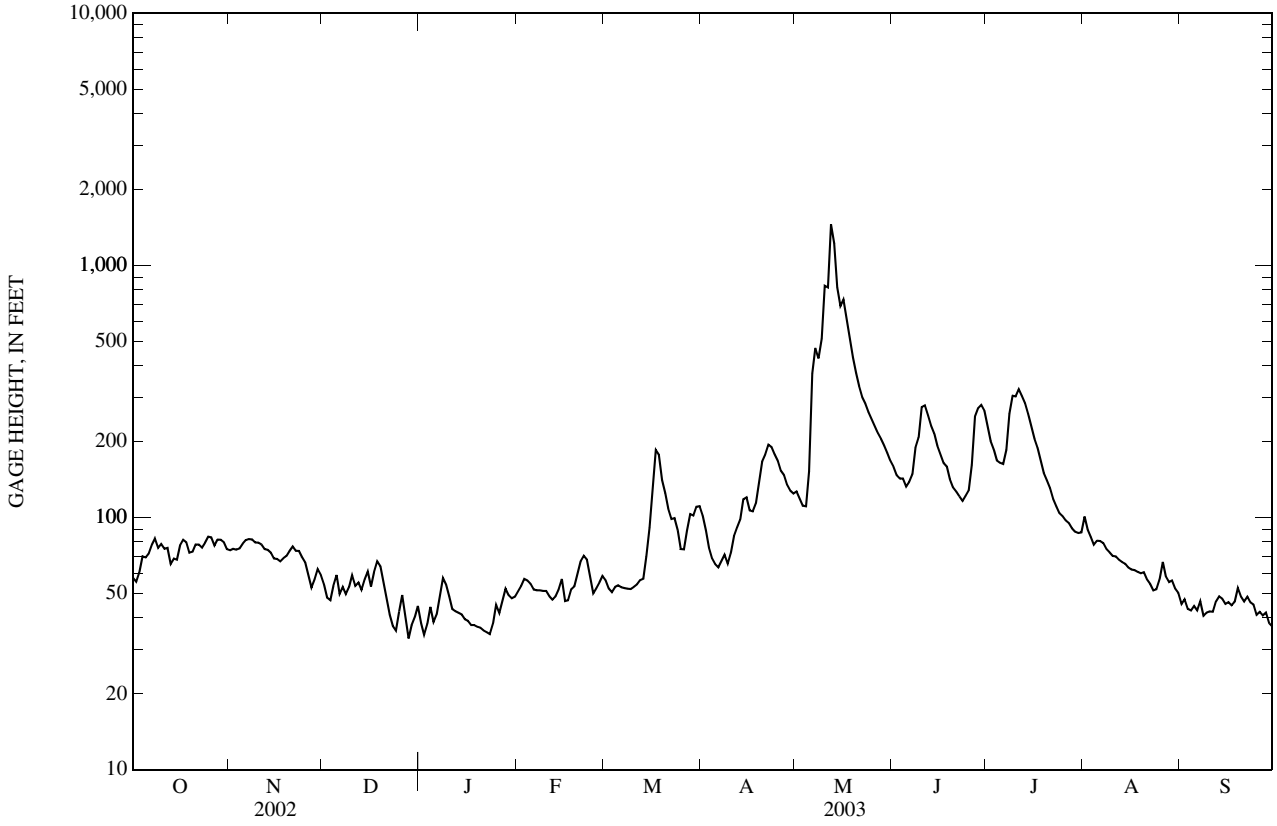
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2003, BY WATER YEAR (WY)

MEAN	74.7	71.7	50.2	42.4	54.4	86.5	116	436	183	178	66.5	44.5
MAX	74.7	71.7	50.2	42.4	54.4	86.5	116	436	183	178	66.5	44.5
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)
MIN	74.7	71.7	50.2	42.4	54.4	86.5	116	436	183	178	66.5	44.5
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)

05387440 UPPER IOWA RIVER AT BLUFFTON, IA—Continued

SUMMARY STATISTICS	FOR 2003 WATER YEAR	
ANNUAL TOTAL	42,950	
ANNUAL MEAN	118	
HIGHEST DAILY MEAN	1,460	May 12
LOWEST DAILY MEAN	33	Dec 28a
ANNUAL SEVEN-DAY MINIMUM	36	Jan 17
MAXIMUM PEAK FLOW	1,610	May 12
MAXIMUM PEAK STAGE	6.24	May 12
INSTANTANEOUS LOW FLOW	29	Sep 30
ANNUAL RUNOFF (AC-FT)	85,190	
ANNUAL RUNOFF (CFSM)	0.32	
ANNUAL RUNOFF (INCHES)	4.35	
10 PERCENT EXCEEDS	230	
50 PERCENT EXCEEDS	72	
90 PERCENT EXCEEDS	42	

a Ice affected
e Estimated



05387500 UPPER IOWA RIVER AT DECORAH, IA

LOCATION.--Lat 43°18'19", long 91°47'48", in NW¼ NE¼ SW¼ sec.16, T.98 N., R.8 W., Winneshiek County, Hydrologic Unit 07060002, on right bank 1,200 ft upstream of bridge on College Drive, 0.8 miles downstream from Dry Run Creek Cutoff, and 3.0 miles upstream from Trout Run.

DRAINAGE AREA.--511 mi^2.

PERIOD OF RECORD.--Discharge records from August 1951 to September 1983, October 1, 2002 to September 30, 2003; Stage only records from October 20, 1999 to September 30, 2002.

GAGE.--Water-stage recorder. Datum of gage is 850.00 ft. above NGVD of 1929.

REMARKS.--Records good. U.S. Geological Survey satellite and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood known, probably since at least 1913, occurred May 29, 1941, at site of former gaging station near Decorah, 4 miles downstream, discharge, 28,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	90	e77	e61	e72	e64	141	176	226	287	115	68
2	111	91	e70	e59	69	e57	127	163	218	257	113	67
3	119	91	e68	e70	68	e57	119	153	212	239	114	66
4	132	93	e74	81	e68	e58	115	159	205	228	109	64
5	129	97	e79	84	e68	e59	112	225	199	225	107	63
6	127	98	e68	81	e65	e59	109	342	221	215	105	62
7	125	96	e73	80	e66	e58	113	565	239	236	101	62
8	127	97	e68	85	e66	e58	112	524	251	282	98	60
9	121	96	e72	86	e68	e57	109	727	270	360	96	59
10	115	96	e76	e74	e65	e59	110	945	317	356	94	61
11	111	99	e69	e67	e63	e59	116	1,070	354	378	93	65
12	110	96	e73	e66	e62	e60	125	1,600	328	368	90	70
13	108	98	e68	e65	e62	e63	127	1,630	301	339	88	68
14	106	97	e75	e64	67	e82	137	1,120	278	318	87	69
15	105	96	e81	e63	69	e118	143	927	256	281	85	68
16	104	96	e69	e63	e58	e162	146	932	235	253	84	67
17	101	96	e81	e62	e57	211	149	836	219	237	84	67
18	98	96	e89	e60	61	188	152	708	209	218	82	66
19	93	96	e87	e59	61	159	179	614	199	201	79	72
20	90	96	e78	e59	e69	141	230	539	186	187	80	69
21	92	97	e73	e58	e84	125	242	473	175	176	79	69
22	92	98	e69	e56	e85	110	245	422	165	165	77	71
23	92	96	e64	e58	e80	101	246	391	158	157	74	69
24	93	94	e61	e59	e64	99	233	361	168	150	73	68
25	97	93	e67	e63	e55	96	218	334	183	135	77	68
26	97	e85	e83	e60	e58	91	205	310	205	116	81	70
27	93	e78	e68	e63	e62	107	194	289	266	113	78	68
28	96	e83	e60	e67	e67	164	182	273	366	109	73	67
29	94	e87	e64	e65	---	159	174	256	322	106	72	64
30	92	e83	e65	e70	---	148	176	247	322	103	70	66
31	91	---	e67	e73	---	149	---	234	---	103	68	---
TOTAL	3,263	2,805	2,236	2,081	1,859	3,178	4,786	17,545	7,253	6,898	2,726	1,993
MEAN	105	93.5	72.1	67.1	66.4	103	160	566	242	223	87.9	66.4
MAX	132	99	89	86	85	211	246	1,630	366	378	115	72
MIN	90	78	60	56	55	57	109	153	158	103	68	59
AC-FT	6,470	5,560	4,440	4,130	3,690	6,300	9,490	34,800	14,390	13,680	5,410	3,950
CFSM	0.21	0.18	0.14	0.13	0.13	0.20	0.31	1.11	0.47	0.44	0.17	0.13
IN.	0.24	0.20	0.16	0.15	0.14	0.23	0.35	1.28	0.53	0.50	0.20	0.15

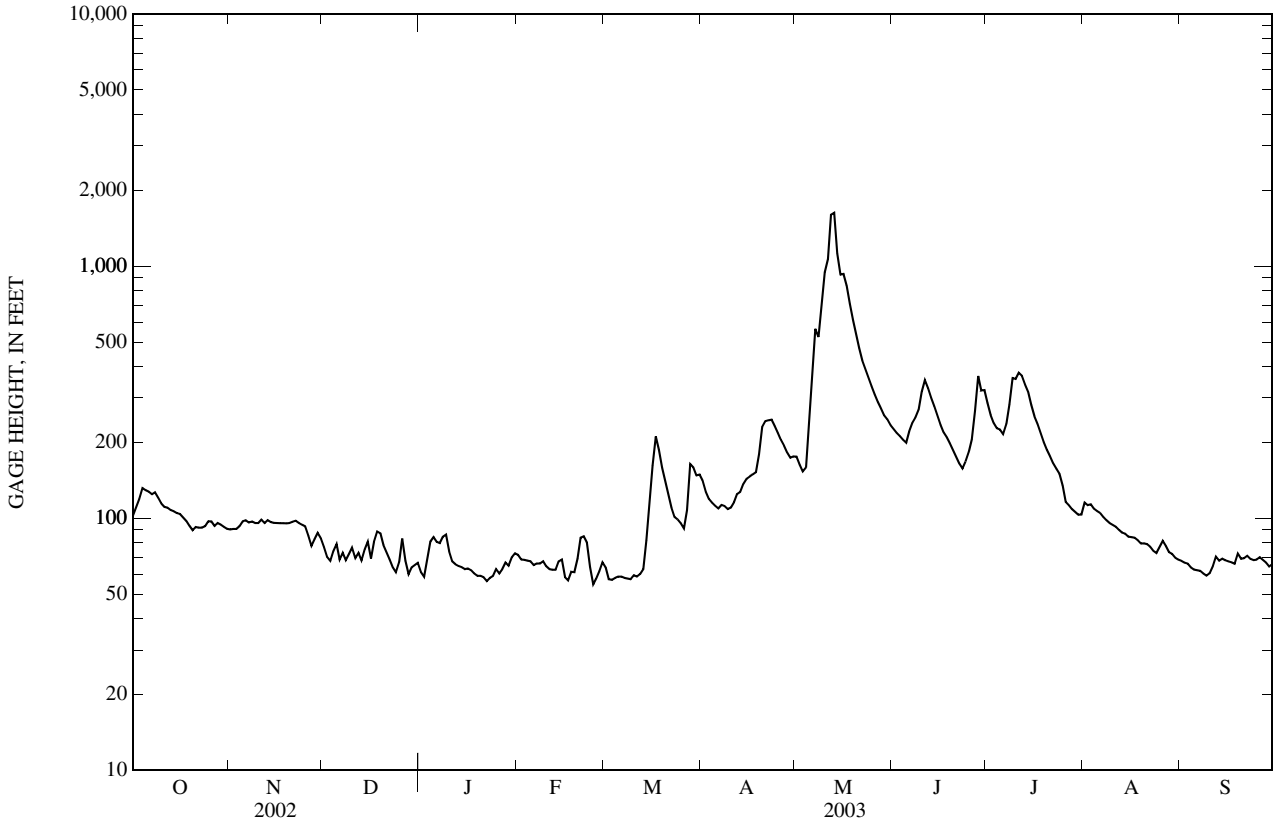
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2003, BY WATER YEAR (WY)

MEAN	244	214	159	132	160	681	620	420	425	305	241	266
MAX	896	1,111	940	662	789	1,937	2,067	1,453	1,652	1,028	1,353	1,305
(WY)	(1973)	(1983)	(1983)	(1973)	(1966)	(1961)	(1965)	(1973)	(1969)	(1969)	(1953)	(1965)
MIN	37.2	43.2	40.2	25.7	25.2	72.6	89.6	81.6	64.5	53.0	44.8	39.6
(WY)	(1959)	(1965)	(1959)	(1959)	(1959)	(1968)	(1957)	(1958)	(1958)	(1958)	(1958)	(1958)

05387500 UPPER IOWA RIVER AT DECORAH, IA—Continued

SUMMARY STATISTICS	FOR 2003 WATER YEAR		WATER YEARS 1952 - 2003	
ANNUAL TOTAL	56,623			
ANNUAL MEAN	155		322	
HIGHEST ANNUAL MEAN			845	1983
LOWEST ANNUAL MEAN			96.7	1958
HIGHEST DAILY MEAN	1,630	May 13	15,000	Mar 27, 1961
LOWEST DAILY MEAN	55	Feb 25a	22	Feb 2, 1959
ANNUAL SEVEN-DAY MINIMUM	58	Mar 2	22	Feb 1, 1959
MAXIMUM PEAK FLOW	1,920	May 12b	20,200	Mar 27, 1961
MAXIMUM PEAK STAGE	5.16	May 12	13.08	Mar 27, 1961
ANNUAL RUNOFF (AC-FT)	112,300		233,300	
ANNUAL RUNOFF (CFSM)	0.30		0.63	
ANNUAL RUNOFF (INCHES)	4.12		8.56	
10 PERCENT EXCEEDS	284		632	
50 PERCENT EXCEEDS	96		152	
90 PERCENT EXCEEDS	62		61	

a Ice affected.
b Also May 13.
e Estimated



05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA

LOCATION.--Lat 43°25'16", long 91°30'31", in SW¼ NW¼ sec.1, T.99 N., R.6 W., Allamakee County, Hydrologic Unit 07060002, on right bank at upstream side of bridge on State Highway 76, 650 ft. upstream from Mineral Creek, 0.5 mi upstream from Bear Creek, 3.5 mi south of Dorchester, and 18.1 mi upstream from mouth.

DRAINAGE AREA.--770 mi^2.

PERIOD OF RECORD.--September 1936 to September 1938 and October 1939 to June 1975(discharge measurements only), October 1938 to September 1939, July 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 660.00 ft. above NGVD of 1929. Prior to Jan. 6, 1938, nonrecording gage on old bridge at site 0.2 mi upstream at datum 5.91 ft. higher. Jan. 6, 1938 to Apr. 26, 1948, nonrecording gage at datum 60.00 ft. lower, Apr. 27, 1948 to August 1963, nonrecording gage on old bridge and August 1963 to June 1975 nonrecording gage on new bridge at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1941, reached a stage of 21.8 ft., from flood profile, discharge, 30,400 ft^3/s on basis of slope-area determination of peak flow.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	196	195	e149	e144	e112	e132	250	318	359	441	210	141
2	208	193	e144	e133	e120	e128	235	305	350	405	214	139
3	242	192	e139	e137	e139	e130	221	290	347	392	208	138
4	281	192	e144	e144	e132	e131	216	288	339	374	198	137
5	268	197	e153	e135	e126	e130	215	337	331	360	191	134
6	256	202	e149	e141	e125	e128	203	403	341	357	191	133
7	244	198	e160	e145	e124	e127	210	571	389	365	188	132
8	242	198	e157	e159	e123	e123	213	684	391	383	e185	130
9	241	197	e160	e140	e123	e119	205	830	397	441	e182	128
10	234	197	e168	e107	e123	e124	204	1,040	406	503	e180	127
11	222	202	e166	e103	e120	e130	209	1,270	452	498	e179	126
12	216	199	e168	e102	e118	e155	219	1,340	466	512	e176	151
13	210	194	e161	e99	e121	e183	227	1,730	450	492	e174	165
14	207	194	e168	e96	e123	e221	230	1,480	434	466	e171	149
15	208	192	e171	e95	e126	e285	241	1,240	407	438	e169	143
16	203	191	e163	e95	e120	e367	251	1,120	377	404	e167	140
17	200	189	e171	e92	e122	e454	262	1,090	353	384	e164	136
18	203	188	e177	e89	e134	379	263	978	342	365	e161	134
19	201	188	e176	e88	e141	342	287	866	328	343	e157	163
20	196	188	e172	e87	e147	310	345	761	316	328	e154	159
21	197	191	e160	e85	e151	287	408	667	305	321	151	150
22	198	189	e147	e85	e151	265	402	610	296	306	147	151
23	195	190	e138	e82	e143	243	398	568	287	290	144	145
24	199	187	e133	e86	e125	231	391	533	294	276	143	140
25	206	184	e148	e88	e119	223	375	500	312	265	161	134
26	208	e163	e162	e86	e122	213	356	469	332	254	158	135
27	203	e152	e152	e89	e128	226	339	442	338	243	157	142
28	204	e156	e138	e93	e134	262	324	423	489	231	153	136
29	204	e158	e141	e92	---	284	309	401	479	223	149	133
30	200	e154	e149	e100	---	266	310	391	450	215	144	129
31	197	---	e154	e105	---	252	---	376	---	212	141	---
TOTAL	6,689	5,610	4,838	3,322	3,592	6,850	8,318	22,321	11,157	11,087	5,267	4,200
MEAN	216	187	156	107	128	221	277	720	372	358	170	140
MAX	281	202	177	159	151	454	408	1,730	489	512	214	165
MIN	195	152	133	82	112	119	203	288	287	212	141	126
AC-FT	13,270	11,130	9,600	6,590	7,120	13,590	16,500	44,270	22,130	21,990	10,450	8,330
CFSM	0.28	0.24	0.20	0.14	0.17	0.29	0.36	0.94	0.48	0.46	0.22	0.18
IN.	0.32	0.27	0.23	0.16	0.17	0.33	0.40	1.08	0.54	0.54	0.25	0.20

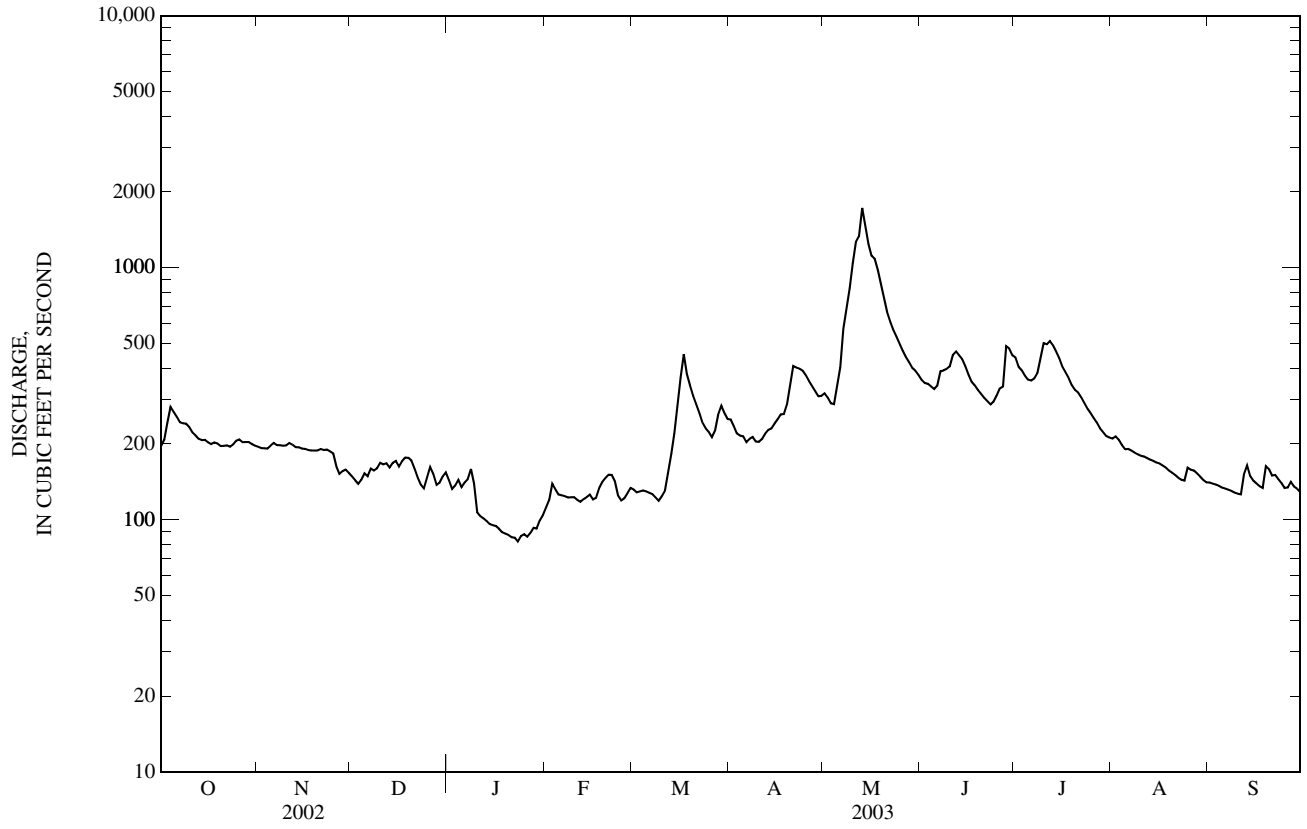
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2003, BY WATER YEAR (WY)

MEAN	405	425	343	253	390	968	1,067	833	885	672	560	436
MAX	2,045	1,476	1,421	836	1,400	1,922	3,973	2,066	3,538	3,318	3,702	1,334
(WY)	(1987)	(1983)	(1983)	(1983)	(1984)	(1983)	(1993)	(1991)	(2000)	(1993)	(1993)	(1986)
MIN	116	125	99.9	96.7	112	221	225	175	123	92.9	112	77.5
(WY)	(1990)	(1990)	(1990)	(1977)	(1978)	(2003)	(1977)	(1977)	(1977)	(1939)	(1989)	(1939)

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1939 - 2003	
ANNUAL TOTAL	119,459		93,251			
ANNUAL MEAN	327		255		606	
HIGHEST ANNUAL MEAN					1,726	1993
LOWEST ANNUAL MEAN					178	1977
HIGHEST DAILY MEAN	1,520	May 9	1,730	May 13	15,100	Aug 17, 1993
LOWEST DAILY MEAN	114	Feb 5	82	Jan 23a	30	Sep 23, 1939
ANNUAL SEVEN-DAY MINIMUM	124	Feb 1	86	Jan 20	49	Sep 20, 1939
MAXIMUM PEAK FLOW			1,780	May 13	22,000	Aug 17, 1993
MAXIMUM PEAK STAGE			9.67	May 13	20.00	Aug 17, 1993
ANNUAL RUNOFF (AC-FT)	236,900		185,000		438,900	
ANNUAL RUNOFF (CFSM)	0.43		0.33		0.79	
ANNUAL RUNOFF (INCHES)	5.77		4.51		10.69	
10 PERCENT EXCEEDS	579		436		1,300	
50 PERCENT EXCEEDS	255		195		359	
90 PERCENT EXCEEDS	160		123		140	

a Ice affected
e Estimated



05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA

LOCATION.--Lat 43°02'27", long 91°12'23", in Basil Giard Claim #1, sec.16, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001, on right bank 50 ft downstream from State Highway 18 bridge, 1.5 miles upstream from mouth at Mississippi River, and 1.5 miles west of Marquette.

DRAINAGE AREA.--34.1 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 624.818 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	13	e11	e10	12	12	11	22	10	12	12	14
2	14	13	e11	e9.6	12	11	10	16	11	13	12	12
3	13	13	e10	e9.9	13	11	10	15	11	14	11	11
4	16	13	e10	e10	12	12	10	13	11	14	11	12
5	14	13	e10	13	12	10	10	16	11	15	11	12
6	13	14	e10	13	13	11	9.9	14	12	14	11	12
7	13	13	e11	13	12	11	10	16	12	14	11	12
8	14	14	e10	13	12	11	10	17	12	14	11	12
9	14	13	e11	12	11	9.3	10	28	11	14	11	11
10	13	13	13	11	11	9.2	10	25	11	13	11	12
11	13	14	14	9.3	11	10	10	36	11	13	12	11
12	12	14	14	11	10	11	10	28	12	14	11	13
13	13	14	14	12	10	35	9.8	22	10	14	11	13
14	13	14	13	12	11	49	9.7	21	11	14	12	13
15	13	15	13	11	11	33	9.6	19	12	13	12	11
16	13	14	13	11	11	22	10	17	12	13	11	11
17	13	14	13	12	12	16	10	16	12	13	11	11
18	13	14	14	12	13	12	10	16	12	13	11	11
19	12	14	14	12	12	11	11	15	12	13	11	13
20	12	14	14	12	22	12	18	14	11	14	11	11
21	12	15	13	13	28	11	14	13	11	14	11	11
22	13	15	13	13	18	11	13	13	12	13	11	12
23	12	14	12	12	12	10	12	14	12	13	12	12
24	13	14	12	12	11	10	12	14	13	13	12	11
25	14	14	13	12	9.8	10	12	12	19	13	12	11
26	13	e13	11	12	10	9.8	12	12	18	13	13	11
27	12	e13	12	12	11	11	13	12	13	13	12	11
28	13	e13	13	12	12	11	13	12	13	12	13	11
29	13	e12	13	12	---	10	13	12	12	12	12	11
30	13	e12	13	12	---	9.9	16	12	12	12	12	11
31	12	---	12	12	---	11	---	11	---	12	12	---
TOTAL	404	408	380	362.8	354.8	433.2	339.0	523	362	411	357	350
MEAN	13.0	13.6	12.3	11.7	12.7	14.0	11.3	16.9	12.1	13.3	11.5	11.7
MAX	16	15	14	13	28	49	18	36	19	15	13	14
MIN	12	12	10	9.3	9.8	9.2	9.6	11	10	12	11	11
AC-FT	801	809	754	720	704	859	672	1,040	718	815	708	694
CFSM	0.38	0.40	0.36	0.34	0.37	0.41	0.33	0.49	0.35	0.39	0.34	0.34
IN.	0.44	0.44	0.41	0.40	0.39	0.47	0.37	0.57	0.39	0.45	0.39	0.38

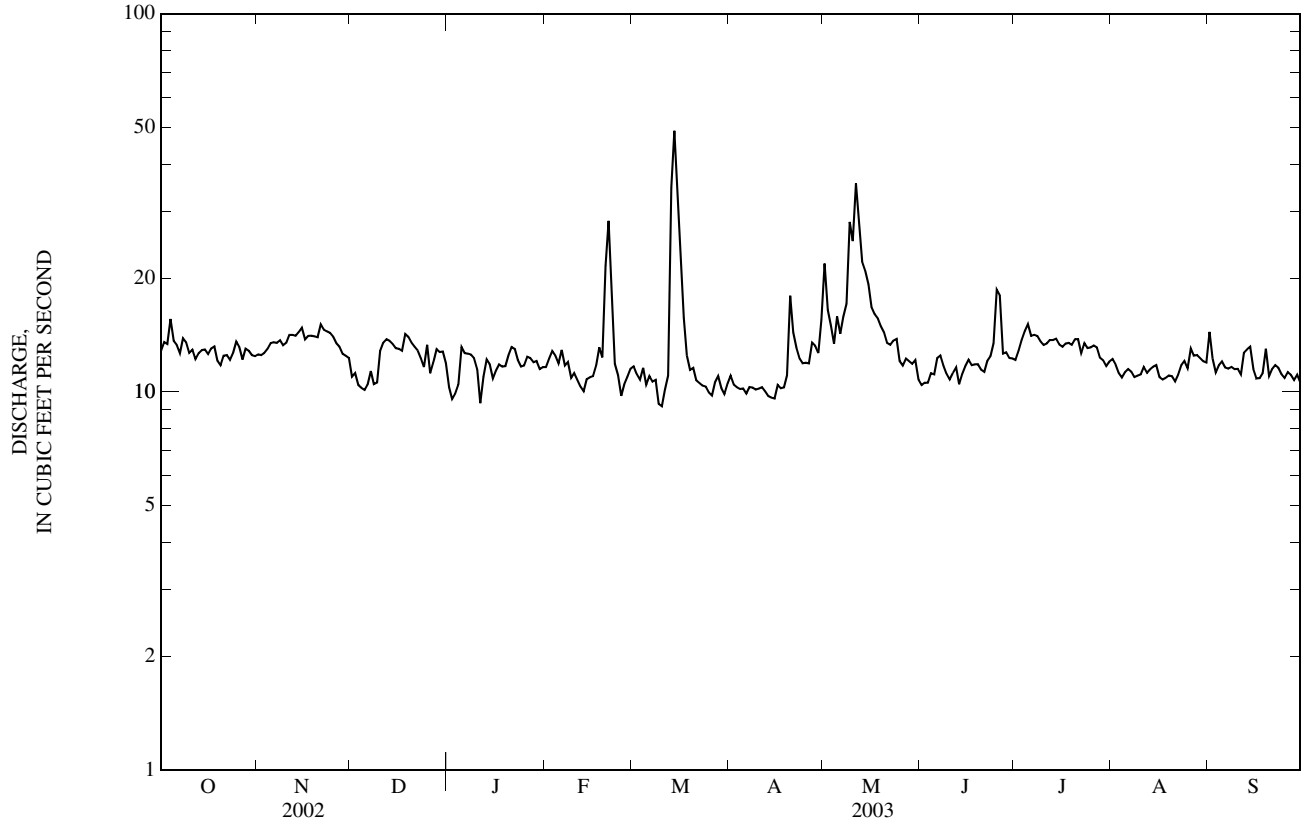
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 2003, BY WATER YEAR (WY)

MEAN	20.2	21.0	17.6	15.8	20.9	27.4	25.6	29.1	29.3	26.3	24.7	21.7
MAX	30.9	35.3	26.0	22.3	33.6	87.6	55.3	65.7	55.4	54.2	48.9	36.4
(WY)	(1994)	(1992)	(1992)	(1992)	(1994)	(1993)	(1993)	(1993)	(1993)	(1993)	(1993)	(1993)
MIN	13.0	13.5	11.2	9.80	11.3	14.0	11.3	16.9	12.1	13.3	11.5	11.7
(WY)	(2003)	(1998)	(1998)	(2001)	(2001)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1992 - 2003	
ANNUAL TOTAL	6,069		4,684.8			
ANNUAL MEAN	16.6		12.8		23.3	
HIGHEST ANNUAL MEAN					42.1	1993
LOWEST ANNUAL MEAN					12.8	2003
HIGHEST DAILY MEAN	37	Jun 4	49	Mar 14	550	Mar 31, 1993
LOWEST DAILY MEAN	10	Dec 3	9.2	Mar 10	6.8	Jan 20, 2001
ANNUAL SEVEN-DAY MINIMUM	10	Dec 2	9.9	Apr 9	8.3	Jan 20, 2001
MAXIMUM PEAK FLOW			101	Mar 14	1,820	Feb 18, 1997
MAXIMUM PEAK STAGE			4.89	Mar 14	7.68	Feb 18, 1997
INSTANTANEOUS LOW FLOW			6.9	Mar 10		
ANNUAL RUNOFF (AC-FT)	12,040		9,290		16,880	
ANNUAL RUNOFF (CFSM)	0.49		0.38		0.68	
ANNUAL RUNOFF (INCHES)	6.61		5.11		9.27	
10 PERCENT EXCEEDS	22		14		34	
50 PERCENT EXCEEDS	16		12		20	
90 PERCENT EXCEEDS	13		10		12	

e Estimated



05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1991 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1991 to current year.
WATER TEMPERATURES: October 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 670 microsiemens Sept. 27, 1994; minimum daily, 140 microsiemens Oct. 14, 1997.
WATER TEMPERATURES: Maximum daily, 32.0°C Aug. 17, 1998; minimum daily, 0.0°C Jan. 7, 18-21, 1994, Jan. 5,7,8, Feb. 21, 1997, Dec. 9, 2002.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,780 mg/L Mar. 31, 1993; minimum daily mean, 1 mg/L Oct. 30, 1994.
SEDIMENT LOADS: Maximum daily, 4,500 tons Mar. 31, 1993; minimum daily, 0.08 tons Oct. 30, 1994, Nov. 23-24, 1997, and Dec. 8, 1997.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 630 microsiemens June 6; minimum daily, 366 microsiemens Dec. 6.
WATER TEMPERATURES: Maximum daily, 21.0°C June 24, Aug. 20; minimum daily, 0.0°C Dec. 9.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 348 mg/L Mar. 14; minimum daily mean, 9.0 mg/L Nov. 11.
SEDIMENT LOADS: Maximum daily, 51 tons Mar.14; minimum daily, 0.26 tons Apr. 17.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Temperature, water, deg C (00010)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT						
16...	0905	12	6.4	81	61	2.0
NOV						
19...	0925	14	3.9	62	53	2.0
JAN						
07...	1500	13	5.9	71	46	1.6
FEB						
19...	1050	12	3.7	89	48	1.5
APR						
03...	0940	9.8	7.7	61	50	1.3
MAY						
20...	0825	15	11.5	75	30	1.2
JUN						
17...	0920	12	13.7	34	43	1.3
AUG						
05...	1650	11	16.5	64	38	1.1
SEP						
17...	1215	11	15.3	46	43	1.3

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	462	445	408	491	---	---	553	482	440	452	516	580
2	552	---	484	427	419	452	470	459	---	475	536	524
3	552	---	411	---	392	426	389	404	486	---	---	497
4	560	436	378	---	454	437	---	---	459	499	591	556
5	---	400	404	552	453	486	---	497	460	---	455	495
6	---	402	366	552	525	427	---	506	630	---	490	---
7	551	431	---	406	---	---	461	470	---	423	440	561
8	563	429	---	---	---	---	438	---	501	463	440	508
9	605	---	392	400	451	422	388	568	471	416	---	517
10	---	---	379	416	481	---	400	---	508	506	---	523
11	552	409	479	---	414	462	456	---	426	434	518	---
12	603	501	395	---	416	595	---	556	---	---	493	---
13	---	483	393	430	473	516	408	490	525	---	452	565
14	587	405	---	456	---	418	446	455	---	514	467	---
15	401	421	---	457	---	---	403	537	---	---	529	601
16	402	---	390	472	440	---	409	530	576	421	---	580
17	---	514	389	515	503	517	---	---	428	447	---	542
18	417	482	418	---	---	534	---	468	462	431	512	555
19	---	415	412	---	448	546	437	514	483	462	540	---
20	413	---	404	470	421	526	---	460	---	425	527	---
21	406	432	---	403	508	484	407	520	470	467	542	530
22	406	435	---	415	---	---	417	494	---	417	504	539
23	406	---	429	429	579	517	431	---	456	440	---	552
24	392	---	402	401	553	532	415	---	447	489	---	547
25	422	391	452	---	542	466	435	514	492	---	481	543
26	---	441	445	---	482	486	---	501	520	---	502	---
27	---	398	483	412	454	---	---	589	554	---	523	---
28	414	406	---	429	465	546	473	528	428	---	454	570
29	410	---	459	410	---	---	462	479	---	437	517	495
30	571	---	483	402	---	513	477	---	418	418	---	487
31	425	---	534	394	---	526	---	---	---	441	---	---

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	7.0	5.0	4.0	---	---	13.0	16.0	16.0	19.0	19.0	17.0
2	15.0	---	5.0	5.0	5.0	5.0	13.0	15.0	---	19.0	16.0	16.0
3	15.0	---	4.0	---	5.0	5.0	8.0	16.0	14.0	---	---	16.0
4	16.0	8.0	5.0	---	3.0	8.0	---	---	14.0	16.0	17.0	16.0
5	---	7.0	5.0	5.0	5.0	6.0	---	11.0	16.0	---	16.0	16.0
6	---	9.0	5.0	5.0	5.0	7.0	---	16.0	14.0	---	18.0	---
7	13.0	10.0	---	6.0	---	---	5.0	14.0	---	20.0	18.0	17.0
8	14.0	10.0	---	---	---	---	11.0	---	15.0	16.0	18.0	18.0
9	14.0	---	0.0	5.0	3.0	3.0	12.0	17.0	14.0	16.0	---	18.0
10	---	---	4.0	3.0	3.0	---	13.0	---	18.0	16.0	---	17.0
11	16.0	8.0	3.0	---	5.0	7.0	13.0	---	16.0	16.0	19.0	---
12	14.0	8.0	6.0	---	1.0	7.0	---	16.0	---	---	18.0	---
13	---	8.0	5.0	3.0	6.0	6.0	9.0	17.0	19.0	---	18.0	15.0
14	12.0	7.0	---	2.0	---	5.0	18.0	13.0	---	19.0	19.0	---
15	12.0	6.0	---	4.0	---	---	18.0	15.0	---	---	19.0	14.0
16	11.0	---	5.0	3.0	6.0	---	11.0	17.0	20.0	18.0	---	16.0
17	---	5.0	5.0	4.0	5.0	10.0	---	---	20.0	19.0	---	16.0
18	12.0	6.0	8.0	---	---	8.0	---	13.0	20.0	19.0	20.0	17.0
19	---	3.9	6.0	---	3.7	6.0	13.0	16.0	20.0	18.0	19.0	---
20	11.0	---	5.0	3.0	8.0	8.0	---	11.5	---	17.0	21.0	---
21	12.0	7.0	---	3.0	5.0	7.0	13.0	16.0	13.0	17.0	20.0	11.0
22	10.0	6.0	---	1.0	---	---	15.0	16.0	---	17.0	19.0	13.0
23	11.0	---	4.0	1.0	4.0	11.0	16.0	---	17.0	17.0	---	9.0
24	10.0	---	4.0	3.0	4.0	11.0	12.0	---	21.0	18.0	---	11.0
25	10.0	5.0	3.0	---	5.0	12.0	17.0	16.0	---	---	20.0	11.0
26	---	5.0	5.0	---	5.0	10.0	---	11.0	17.0	---	20.0	---
27	---	4.0	5.0	5.0	6.0	---	---	19.0	19.0	---	19.0	---
28	10.0	3.0	---	3.0	6.0	9.0	17.0	19.0	14.0	---	19.0	11.0
29	9.0	---	5.0	4.0	---	---	13.0	18.0	---	18.0	18.0	11.0
30	9.0	---	6.0	5.0	---	9.0	11.0	---	19.0	19.0	---	10.0
31	9.0	---	5.0	7.0	---	10.0	---	---	---	18.0	---	---

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

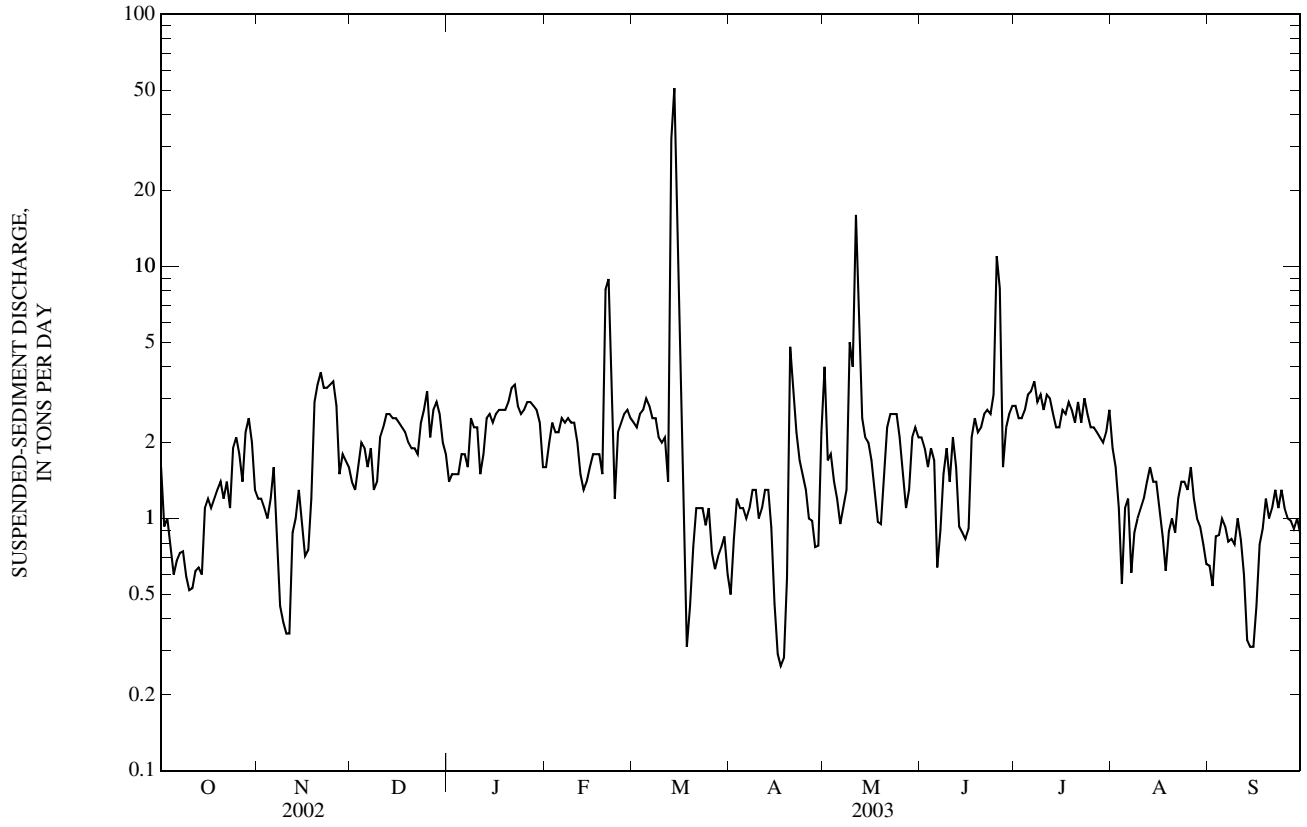
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	44	1.6	36	1.2	46	1.4	52	1.4	52	1.6	76	2.4
2	26	0.93	35	1.2	45	1.3	58	1.5	61	2.0	78	2.3
3	27	1.0	31	1.1	58	1.6	57	1.5	68	2.4	88	2.6
4	19	0.78	28	1.0	74	2.0	54	1.5	64	2.2	87	2.7
5	16	0.60	34	1.2	69	1.9	52	1.8	68	2.2	107	3.0
6	19	0.68	45	1.6	59	1.6	51	1.8	71	2.5	95	2.8
7	21	0.73	21	0.77	63	1.9	48	1.6	74	2.4	88	2.5
8	20	0.74	12	0.45	48	1.3	73	2.5	78	2.5	86	2.5
9	16	0.59	11	0.39	48	1.4	70	2.3	81	2.4	84	2.1
10	15	0.52	10	0.35	60	2.1	73	2.3	78	2.4	82	2.0
11	15	0.53	9	0.35	62	2.3	58	1.5	69	2.0	78	2.1
12	19	0.62	23	0.88	68	2.6	60	1.8	52	1.5	48	1.4
13	19	0.64	27	1.0	70	2.6	75	2.5	46	1.3	239	32
14	17	0.60	34	1.3	70	2.5	82	2.6	49	1.4	348	51
15	32	1.1	24	0.95	69	2.5	81	2.4	54	1.6	249	23
16	34	1.2	19	0.71	69	2.4	83	2.6	59	1.8	142	8.6
17	30	1.1	20	0.75	64	2.3	85	2.7	58	1.8	47	2.1
18	33	1.2	32	1.2	57	2.2	85	2.7	51	1.8	9	0.31
19	38	1.3	76	2.9	53	2.0	84	2.7	45	1.5	14	0.45
20	44	1.4	90	3.4	53	1.9	85	2.9	94	8.1	25	0.77
21	34	1.2	94	3.8	52	1.9	93	3.3	112	8.9	37	1.1
22	42	1.4	85	3.3	52	1.8	95	3.4	65	3.3	40	1.1
23	33	1.1	84	3.3	72	2.4	83	2.8	38	1.2	39	1.1
24	54	1.9	89	3.4	83	2.7	82	2.6	73	2.2	34	0.94
25	56	2.1	92	3.5	90	3.2	84	2.7	92	2.4	42	1.1
26	49	1.8	80	2.8	69	2.1	85	2.9	92	2.6	28	0.73
27	44	1.4	42	1.5	83	2.7	87	2.9	92	2.7	22	0.63
28	62	2.2	51	1.8	83	2.9	84	2.8	79	2.5	24	0.71
29	73	2.5	51	1.7	75	2.6	81	2.7	---	---	28	0.77
30	60	2.0	48	1.6	57	2.0	77	2.4	---	---	32	0.85
31	38	1.3	---	---	55	1.8	52	1.6	---	---	21	0.60
TOTAL	---	36.76	---	49.40	---	65.9	---	72.7	---	71.2	---	156.26

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	17	0.50	67	4.0	76	2.1	84	2.8	57	1.9	17	0.65
2	29	0.83	39	1.7	66	1.9	73	2.5	50	1.6	16	0.54
3	42	1.2	44	1.8	56	1.6	68	2.5	36	1.1	28	0.85
4	40	1.1	38	1.4	62	1.9	68	2.7	19	0.55	27	0.86
5	40	1.1	29	1.2	56	1.7	76	3.1	34	1.1	31	1.0
6	39	1.0	25	0.95	19	0.64	85	3.2	38	1.2	30	0.93
7	39	1.1	25	1.1	27	0.90	92	3.5	20	0.61	26	0.81
8	47	1.3	29	1.3	46	1.5	78	2.9	30	0.88	26	0.83
9	46	1.3	65	5.0	63	1.9	84	3.1	35	1.0	26	0.79
10	37	1.0	58	4.0	48	1.4	76	2.7	37	1.1	33	1.0
11	39	1.1	161	16	69	2.1	85	3.1	39	1.2	27	0.82
12	47	1.3	69	5.4	50	1.6	80	3.0	46	1.4	18	0.60
13	50	1.3	41	2.5	33	0.93	70	2.6	53	1.6	9	0.33
14	35	0.92	38	2.1	29	0.88	61	2.3	43	1.4	9	0.31
15	18	0.46	39	2.0	26	0.83	65	2.3	45	1.4	10	0.31
16	10	0.29	37	1.7	28	0.91	75	2.7	39	1.1	15	0.45
17	10	0.26	30	1.3	65	2.1	72	2.6	29	0.85	27	0.79
18	10	0.28	23	0.97	77	2.5	79	2.9	21	0.62	30	0.91
19	19	0.58	24	0.95	70	2.2	74	2.7	30	0.89	34	1.2
20	98	4.8	40	1.5	74	2.3	64	2.4	34	1.0	35	1.0
21	83	3.2	63	2.3	84	2.6	77	2.9	31	0.88	36	1.1
22	63	2.2	71	2.6	83	2.7	71	2.4	40	1.2	39	1.3
23	52	1.7	72	2.6	76	2.6	82	3.0	43	1.4	36	1.1
24	47	1.5	69	2.6	85	3.1	73	2.6	43	1.4	42	1.3
25	39	1.3	63	2.1	192	11	66	2.3	43	1.3	38	1.1
26	32	1.0	48	1.5	147	8.2	65	2.3	45	1.6	34	1.0
27	27	0.98	35	1.1	47	1.6	63	2.2	36	1.2	33	0.98
28	22	0.77	39	1.3	68	2.3	62	2.1	31	1.0	31	0.91
29	23	0.78	67	2.1	78	2.6	61	2.0	28	0.93	34	1.0
30	51	2.2	71	2.3	85	2.8	71	2.2	24	0.79	30	0.87
31	---	---	74	2.1	---	---	85	2.7	20	0.66	---	---
TOTAL	---	37.35	---	79.47	---	71.39	---	82.3	---	34.86	---	25.64
YEAR	783.23											

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued



05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--December 1991 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Water years 1992-1995 in files at the District office. Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.92 in., June 20, 1994.

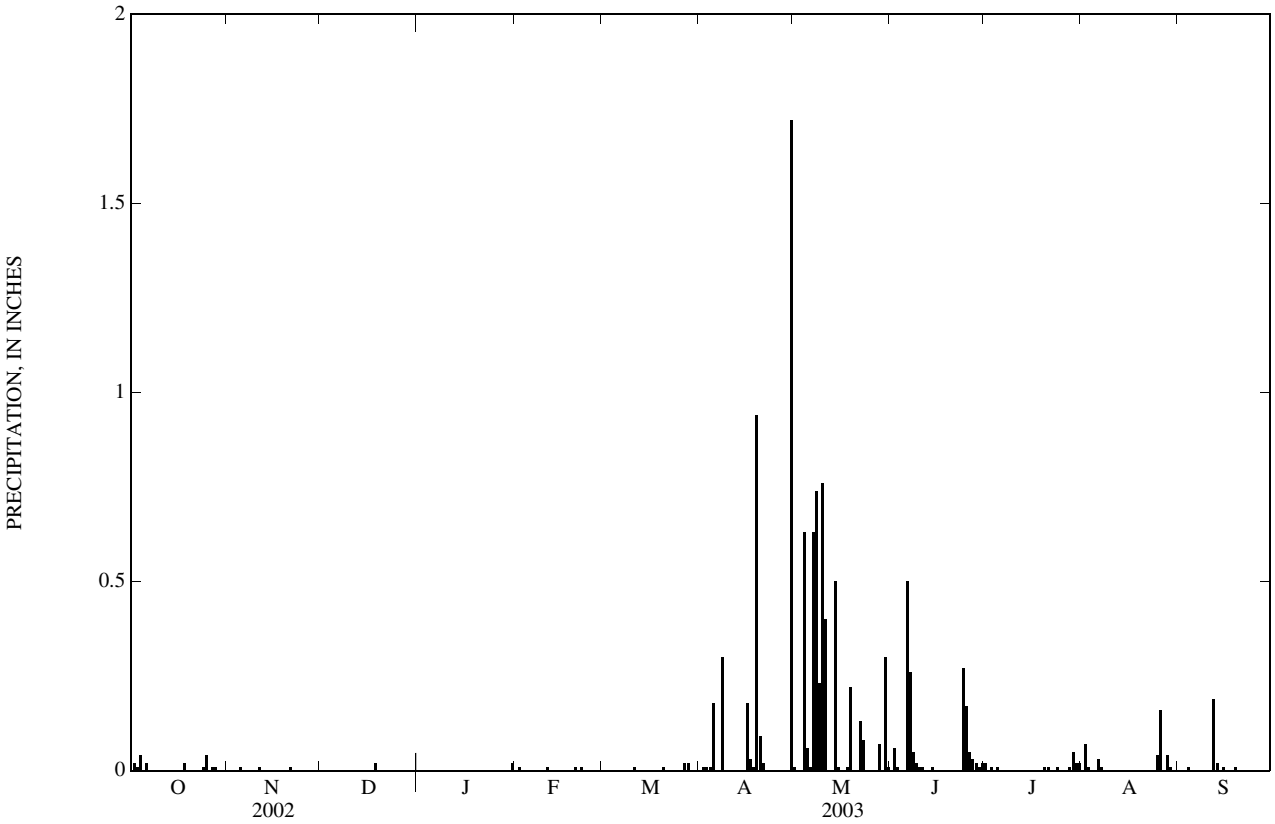
EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 1.72 in., Apr. 30.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	e0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00
2	0.02	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.06	0.00	0.07	0.00
3	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00
4	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.63	0.00	0.00	0.00	0.01
5	0.00	0.01	0.00	0.00	0.00	0.00	0.18	0.06	0.00	0.01	0.00	0.00
6	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.50	0.00	0.03	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.26	0.00	0.01	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.74	0.05	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.02	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.01	0.00	0.00	0.00
11	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.40	0.01	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.01	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
16	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
18	0.02	0.00	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.22	0.00	0.00	0.00	0.01
20	0.00	0.00	0.00	0.00	0.01	0.01	0.09	0.00	0.00	0.01	0.00	0.00
21	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00
22	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.13	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
24	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.01	0.00	0.00
25	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.04	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.16	0.00
27	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.00	0.00
28	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.07	0.02	0.01	0.04	0.00
29	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.01	0.05	0.01	0.00
30	0.00	0.00	0.00	0.00	---	0.00	1.72	0.30	0.02	0.02	0.00	0.00
31	0.00	---	0.00	0.02	---	0.00	---	0.01	---	0.02	0.00	---
TOTAL	0.18	0.03	0.02	0.02	0.04	0.06	3.50	4.80	1.50	0.17	0.37	0.24
MEAN	0.01	0.00	0.00	0.00	0.00	0.00	0.12	0.15	0.05	0.01	0.01	0.01
MAX	0.04	0.01	0.02	0.02	0.01	0.02	1.72	0.76	0.50	0.05	0.16	0.19
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

e Estimated

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA

LOCATION.--Lat 43°01'29", long 91°10'21", in SE¼ SE¼ sec.22, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001, on right bank in city park at east end of Main Street in McGregor, 2.6 mi upstream from Wisconsin River, 4.3 mi downstream from Yellow River, and at mile 633.4 upstream from Ohio River.

DRAINAGE AREA.--67,500 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1936 to current year.

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 604.84 ft above NGVD of 1929. Prior to June 1, 1937, and since June 2, 1939, auxiliary water-stage recorder; June 1, 1937 to June 1, 1939, auxiliary nonrecording gage 14.1 mi upstream in tailwater of dam 9, at datum 5.30 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. U.S. Geological Survey satellite and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1828, that of Apr. 24, 1965.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38,300	48,600	28,600	26,500	e18,900	e19,900	48,600	84,300	71,400	55,800	25,900	13,600
2	39,900	47,700	24,200	26,800	e19,000	e18,900	48,900	80,500	64,100	57,800	25,400	14,800
3	41,500	46,900	23,400	26,800	e19,100	e18,900	46,900	76,600	58,200	62,300	23,500	13,900
4	43,000	45,800	e23,700	25,800	e19,300	e18,400	40,300	71,300	54,100	66,900	23,900	13,200
5	44,100	41,400	e23,800	24,100	e19,200	e18,400	37,300	66,200	50,700	67,600	24,600	10,800
6	44,700	40,900	e23,800	23,500	e19,700	e18,200	36,900	60,800	47,100	67,700	25,000	e9,830
7	47,400	40,900	e24,000	23,600	e20,400	e18,000	38,800	56,800	44,800	69,600	24,100	e9,510
8	53,300	40,300	e23,800	23,300	e20,300	e17,700	39,000	54,500	45,200	69,800	22,300	11,300
9	60,300	39,500	e22,800	22,600	e20,300	e17,700	33,500	56,200	e46,000	67,800	21,500	14,000
10	68,000	38,000	e21,500	22,800	e20,300	e17,700	28,600	59,000	e44,500	66,500	20,700	14,600
11	72,400	38,200	e23,200	e22,900	e20,200	e17,700	27,400	62,900	e44,500	65,700	20,300	14,500
12	77,200	38,500	29,300	e21,600	e20,200	e17,800	32,300	65,700	43,300	63,300	20,600	15,000
13	81,600	38,200	32,700	e21,700	e19,700	e17,500	33,000	69,500	45,400	61,600	18,100	17,800
14	83,900	37,400	34,300	e19,400	e19,100	e17,900	33,100	74,900	47,600	59,300	16,600	18,500
15	85,800	37,500	33,000	e19,300	e18,800	e19,300	e31,900	81,400	49,900	55,900	16,500	17,700
16	84,800	36,700	28,500	e19,200	e18,600	e21,000	31,600	88,500	52,200	52,500	17,200	19,700
17	82,600	35,200	25,000	e19,000	e18,500	33,700	32,200	95,300	52,400	52,000	18,600	17,700
18	80,000	34,000	26,200	e19,000	e18,200	42,200	38,300	102,000	50,500	51,900	16,500	15,100
19	76,700	33,700	28,500	e19,100	e17,900	47,500	46,700	109,000	47,900	52,100	14,000	16,600
20	72,400	33,700	29,800	e18,800	e18,100	48,100	61,300	113,000	45,400	52,100	e12,000	18,100
21	67,000	33,800	30,000	e18,900	e19,100	48,800	69,600	112,000	42,700	50,500	e16,200	18,300
22	62,100	31,800	30,100	e18,800	e20,200	49,700	74,300	106,000	40,200	47,000	20,700	17,900
23	57,900	30,600	30,200	e18,800	e21,200	49,800	78,100	99,700	35,000	43,900	22,100	18,700
24	56,600	31,000	28,400	e18,800	e22,000	48,200	83,100	95,000	32,900	41,000	19,800	17,800
25	55,300	32,300	27,100	e18,800	e22,200	46,200	85,200	91,100	33,900	39,500	12,700	19,900
26	53,900	32,500	26,000	e18,800	e22,200	44,600	87,600	88,900	35,900	36,700	e10,900	17,600
27	51,600	31,700	25,200	e18,900	e21,800	42,000	89,300	86,500	37,000	37,300	e11,300	12,300
28	49,500	28,200	24,600	e19,000	e21,400	42,400	89,900	84,300	42,900	35,400	11,800	e13,500
29	48,800	26,800	24,500	e18,900	---	43,900	88,600	80,800	50,400	31,100	e10,100	e13,200
30	48,600	27,600	24,900	e19,000	---	46,300	86,600	78,500	54,000	28,100	11,000	16,400
31	48,900	---	26,400	e19,100	---	47,700	---	75,800	---	24,600	12,500	---
TOTAL	1,878,100	1,099,400	827,500	653,600	555,900	976,100	1,598,900	2,527,000	1,410,100	1,633,300	566,400	461,840
MEAN	60,580	36,650	26,690	21,080	19,850	31,490	53,300	81,520	47,000	52,690	18,270	15,390
MAX	85,800	48,600	34,300	26,800	22,200	49,800	89,900	113,000	71,400	69,800	25,900	19,900
MIN	38,300	26,800	21,500	18,800	17,900	17,500	27,400	54,500	32,900	24,600	10,100	9,510
AC-FT	3,725,000	2,181,000	1,641,000	1,296,000	1,103,000	1,936,000	3,171,000	5,012,000	2,797,000	3,240,000	1,123,000	916,100
CFSM	0.90	0.54	0.40	0.31	0.29	0.47	0.79	1.21	0.70	0.78	0.27	0.23
IN.	1.04	0.61	0.46	0.36	0.31	0.54	0.88	1.39	0.78	0.90	0.31	0.25

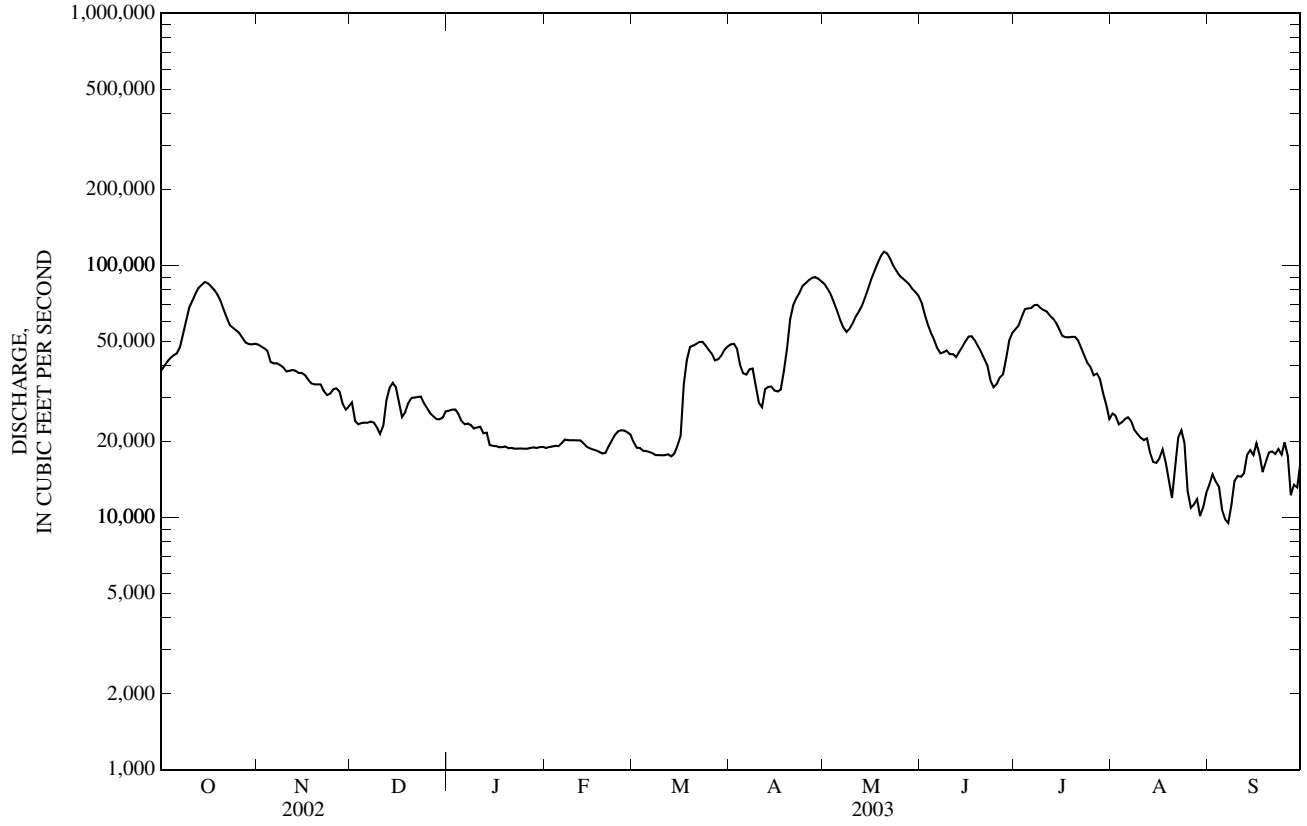
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 2003, BY WATER YEAR (WY)

MEAN	28,910	29,450	22,490	19,490	20,240	39,240	75,890	62,620	50,030	41,760	28,390	28,740
MAX	114,600	64,840	59,200	35,700	48,540	103,800	164,800	138,700	112,600	142,200	84,430	72,890
(WY)	(1987)	(1983)	(1992)	(1983)	(1984)	(1983)	(1965)	(2001)	(1993)	(1993)	(1993)	(1986)
MIN	9,874	10,870	9,506	7,665	9,934	13,190	27,780	18,240	13,420	11,220	10,330	10,650
(WY)	(1937)	(1938)	(1937)	(1940)	(1940)	(1940)	(1990)	(1977)	(1988)	(1988)	(1964)	(1940)

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1936 - 2003	
ANNUAL TOTAL	17,259,600		14,188,140			
ANNUAL MEAN	47,290		38,870		37,320	
HIGHEST ANNUAL MEAN					64,720	1993
LOWEST ANNUAL MEAN					17,400	1977
HIGHEST DAILY MEAN	122,000	Apr 22	113,000	May 20	276,000	Apr 24, 1965
LOWEST DAILY MEAN	17,200	Mar 4	9,510	Sep 7	6,200	Dec 9, 1936
ANNUAL SEVEN-DAY MINIMUM	20,200	Feb 3	11,500	Aug 25	6,490	Dec 7, 1936
MAXIMUM PEAK FLOW			115,000	May 20	276,000	Apr 24, 1965
MAXIMUM PEAK STAGE			16.88	May 20	25.38	Apr 24, 1965
ANNUAL RUNOFF (AC-FT)	34,230,000		28,140,000		27,040,000	
ANNUAL RUNOFF (CFSM)	0.70		0.58		0.55	
ANNUAL RUNOFF (INCHES)	9.51		7.82		7.51	
10 PERCENT EXCEEDS	77,700		75,300		75,900	
50 PERCENT EXCEEDS	44,100		32,700		27,900	
90 PERCENT EXCEEDS	23,800		17,700		13,400	

e Estimated



05389500 MISSISSIPPI RIVER AT MCGREGOR, IA—Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected from right bank dock 1.2 mi upstream from discharge station. Prior to April 1981, and March 7 to Sept. 30, 1997, samples collected at bridge on U.S. Highway 18, 1.2 mi upstream from gage. April 1981 to March 6, 1997, samples collected from right bank dock, 0.3 mi downstream from discharge station.

PERIOD OF RECORD.--July 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1975 to current year.
WATER TEMPERATURES: July 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: July 1975 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 633 microsiemens Nov. 3, 1996; minimum daily, 190 microsiemens Sept. 29, 1980.
WATER TEMPERATURES: Maximum daily, 31.0°C June 28, 2002; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,350 mg/L Mar. 19, 1986; minimum daily mean, 1 mg/L on many days in 1977-92 and 1999.
SEDIMENT LOADS: Maximum daily, 363,000 tons Mar. 19, 1986; minimum daily, 31 tons Dec. 25, 1976.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 490 microsiemens Feb. 2, 9, 19; minimum daily, 267 microsiemens May 20.
WATER TEMPERATURES: Maximum daily, 27.0°C, Aug. 18, 26; minimum daily, 0.0°C many days Dec.- Mar.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 49 mg/L July 14; minimum daily mean, 4 mg/L Dec. 25, 26, Jan. 5, 6, Mar. 8-10, 12.
SEDIMENT LOADS: Maximum daily, 8,690 tons Apr. 21; minimum daily, 191 tons Mar. 8-10.

EXTREMES FOR CURRENT YEAR.--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Temperature, water, deg C (00010)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
NOV						
07...	1215	43,500	--	96	40	4,700
MAR						
17...	1330	42,100	2.0	83	16	1,820
APR						
16...	1200	36,400	14.4	99	46	4,520
MAY						
20...	1300	154,000	17.8	26	100	41,600
JUN						
12...	1000	47,300	20.0	98	25	3,190
AUG						
05...	1110	23,600	--	32	37	2,360
SEP						
15...	1530	17,100	--	99	13	600

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	330	---	---	---	---	---	420	---	432	422	---	398
2	326	---	413	---	490	465	423	---	---	428	---	400
3	---	---	340	---	310	392	---	362	428	---	---	402
4	---	368	362	---	476	442	---	---	442	---	396	---
5	---	366	---	441	---	---	---	369	---	---	391	---
6	---	379	---	442	---	---	---	381	---	---	400	---
7	324	---	---	442	---	---	394	---	---	403	---	410
8	320	---	---	---	---	---	392	---	440	388	---	406
9	314	---	434	---	490	482	387	---	438	375	---	412
10	---	---	441	---	480	---	---	---	438	---	---	---
11	---	376	438	---	---	484	---	---	---	---	396	---
12	---	377	---	---	479	487	---	370	425	---	393	---
13	---	---	---	465	---	---	---	364	---	---	392	---
14	275	382	---	462	---	---	368	364	---	375	---	---
15	278	---	---	---	---	---	357	---	---	---	---	404
16	312	---	413	467	481	---	364	---	418	386	---	405
17	---	395	351	---	484	435	---	---	398	388	---	407
18	---	385	410	---	---	429	---	310	390	---	387	---
19	---	390	---	---	490	420	---	294	---	---	393	---
20	---	---	---	466	---	---	---	267	---	385	394	---
21	357	---	---	414	---	---	348	---	---	381	---	---
22	361	---	---	393	---	---	300	---	---	386	---	406
23	360	---	428	---	474	399	276	---	450	---	---	404
24	---	---	426	---	477	378	---	---	434	---	---	---
25	---	396	433	---	---	366	---	380	434	---	393	409
26	---	393	---	---	480	---	---	386	---	---	391	---
27	---	380	---	454	---	---	---	388	---	---	392	---
28	335	---	---	363	---	---	291	403	---	---	---	416
29	370	---	432	487	---	---	312	---	---	395	---	420
30	360	---	434	---	---	---	330	---	425	390	---	385
31	---	---	434	---	---	414	---	---	---	395	---	---

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	---	---	---	---	---	8.0	---	20.0	24.0	---	23.0
2	20.0	---	0.0	---	1.0	0.0	9.0	---	---	25.0	---	22.0
3	---	---	0.0	---	0.0	0.0	---	15.0	19.0	---	---	23.0
4	---	10.0	0.0	---	0.0	0.0	---	---	19.0	---	25.0	---
5	---	5.0	---	1.0	---	---	---	13.0	---	---	25.0	---
6	---	5.0	---	1.0	---	---	---	15.0	---	---	25.0	---
7	15.0	---	---	1.0	---	---	4.0	---	---	26.0	---	23.0
8	15.0	---	---	---	---	---	5.0	---	20.0	25.0	---	24.0
9	15.0	---	0.0	---	0.0	0.0	6.0	---	20.0	24.0	---	23.0
10	---	---	0.0	---	0.0	---	---	---	22.0	---	---	---
11	---	8.0	0.0	---	---	1.0	---	---	---	---	26.0	---
12	---	8.0	---	---	0.0	1.0	---	14.0	20.0	---	25.0	---
13	---	---	---	0.0	---	---	---	15.0	---	---	25.0	---
14	13.0	6.0	---	0.0	---	---	14.0	15.0	---	24.0	---	---
15	13.0	---	---	---	---	---	15.0	---	---	---	---	21.0
16	12.0	---	0.0	0.0	0.0	---	14.4	---	25.0	25.0	---	21.0
17	---	4.0	1.0	---	0.0	2.0	---	---	26.0	25.0	---	21.0
18	---	4.0	2.0	---	---	3.0	---	17.0	26.0	---	27.0	---
19	---	4.0	---	---	0.0	2.0	---	17.0	---	---	23.0	---
20	---	---	---	0.0	---	---	---	17.8	---	25.0	26.0	---
21	11.0	---	---	0.0	---	---	12.0	---	---	24.0	---	---
22	10.0	---	---	0.0	---	---	12.0	---	---	24.0	---	18.0
23	10.0	---	0.0	---	0.0	4.0	11.0	---	25.0	---	---	16.0
24	---	---	0.0	---	0.0	6.0	---	---	26.0	---	---	---
25	---	3.0	0.0	---	---	6.0	---	18.0	25.0	---	26.0	16.0
26	---	2.0	---	---	0.0	---	---	18.0	---	---	27.0	---
27	---	2.0	---	0.0	---	---	---	20.0	---	---	26.0	---
28	10.0	---	---	0.0	---	---	15.0	20.0	---	---	---	13.0
29	8.0	---	0.0	0.0	---	---	15.0	---	---	26.0	---	13.0
30	8.0	---	1.0	---	---	---	14.0	---	24.0	26.0	---	11.0
31	---	---	1.0	---	---	6.0	---	---	---	26.0	---	---

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

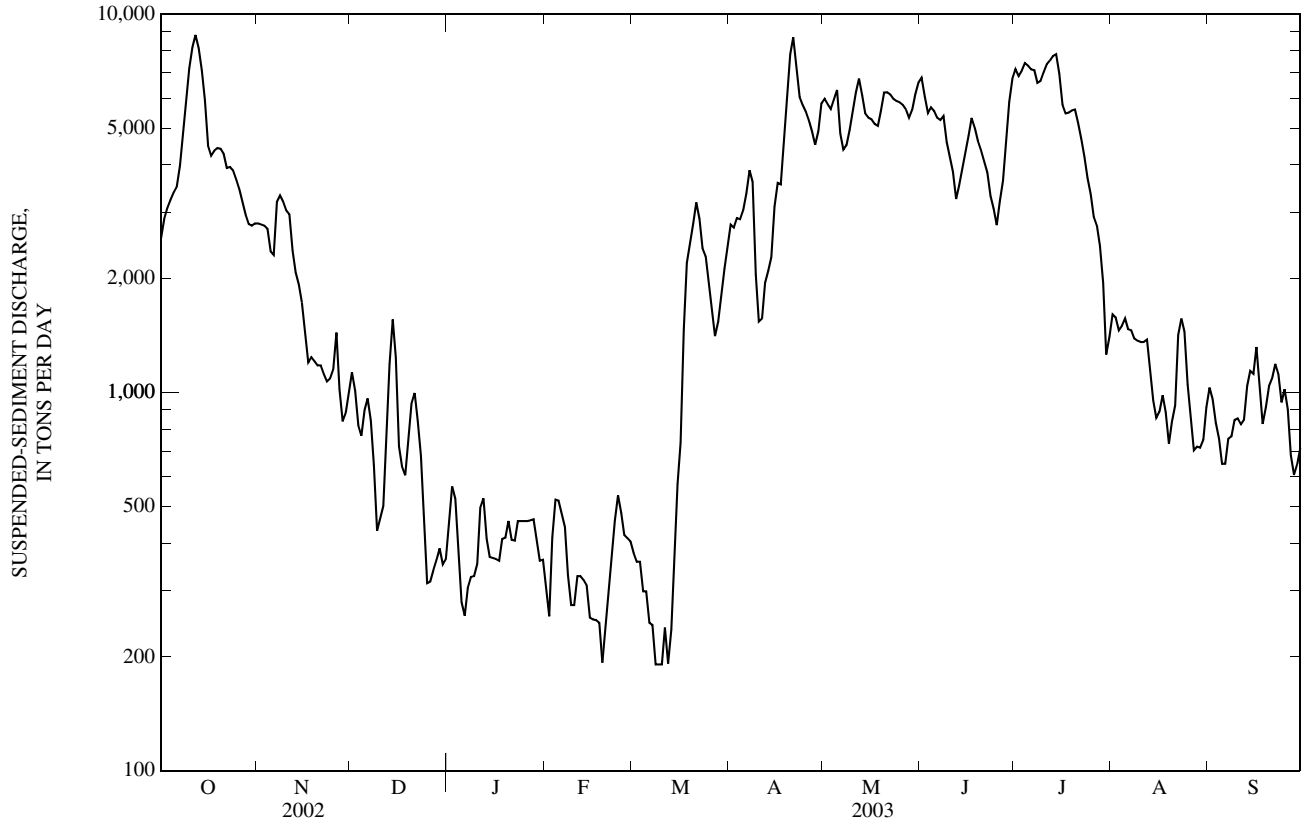
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	25	2,560	21	2,800	15	1,130	6	452	6	306	7	376
2	27	2,880	22	2,780	16	1,010	8	565	5	256	7	357
3	27	3,070	22	2,760	13	818	7	524	8	413	7	357
4	28	3,230	22	2,710	12	768	6	397	10	521	6	298
5	28	3,380	21	2,360	14	900	4	279	10	518	6	298
6	29	3,500	21	2,310	15	964	4	257	9	479	5	246
7	31	3,980	29	3,190	13	842	5	304	8	441	5	243
8	34	4,860	31	3,320	10	643	5	325	6	329	4	191
9	36	5,920	30	3,200	7	431	5	327	5	274	4	191
10	39	7,190	30	3,030	8	464	6	352	5	274	4	191
11	42	8,190	29	2,960	8	501	8	495	6	327	5	239
12	42	8,820	23	2,370	10	760	9	525	6	327	4	192
13	37	8,140	20	2,080	13	1,190	7	410	6	319	5	236
14	31	7,090	19	1,930	17	1,560	7	367	6	309	8	387
15	26	5,930	17	1,730	14	1,240	7	365	5	254	11	573
16	20	4,490	15	1,460	9	720	7	363	5	251	13	737
17	19	4,230	13	1,200	9	637	7	359	5	250	16	1,470
18	20	4,360	13	1,240	9	604	8	410	5	246	19	2,200
19	21	4,430	13	1,210	10	742	8	413	4	193	19	2,490
20	23	4,410	13	1,180	12	934	9	457	5	244	22	2,800
21	24	4,280	13	1,180	12	997	8	408	6	309	24	3,180
22	23	3,920	13	1,120	10	843	8	406	7	382	21	2,880
23	25	3,950	13	1,070	8	681	9	457	8	458	18	2,410
24	25	3,870	13	1,090	6	465	9	457	9	535	18	2,290
25	25	3,660	13	1,150	4	313	9	457	8	480	16	1,950
26	24	3,450	16	1,440	4	316	9	457	7	420	14	1,660
27	23	3,190	12	1,020	5	339	9	459	7	412	12	1,410
28	22	2,960	11	839	5	361	9	462	7	404	13	1,540
29	21	2,790	12	882	6	387	8	408	---	---	15	1,800
30	21	2,760	13	998	5	351	7	359	---	---	17	2,120
31	21	2,800	---	---	5	363	7	361	---	---	19	2,420
TOTAL	---	138,290	---	56,609	---	22,274	---	12,637	---	9,931	---	37,732

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	21	2,780	26	5,980	35	6,800	48	7,160	23	1,610	28	1,030
2	21	2,730	27	5,780	35	6,070	44	6,870	23	1,580	24	961
3	23	2,890	27	5,620	35	5,480	42	7,090	23	1,460	22	832
4	26	2,870	31	5,970	39	5,680	41	7,430	23	1,500	21	756
5	30	3,030	35	6,310	41	5,550	40	7,320	24	1,570	20	648
6	34	3,360	29	4,840	42	5,330	39	7,150	22	1,470	20	648
7	37	3,870	29	4,390	43	5,250	38	7,120	23	1,460	22	754
8	34	3,610	31	4,510	44	5,380	35	6,590	23	1,390	21	765
9	23	2,050	33	4,960	37	4,600	36	6,670	24	1,370	22	845
10	20	1,540	35	5,520	35	4,210	39	7,020	24	1,360	22	854
11	21	1,570	37	6,230	32	3,840	42	7,380	25	1,360	21	824
12	22	1,950	38	6,760	28	3,250	44	7,550	25	1,380	21	847
13	24	2,100	33	6,100	29	3,530	47	7,760	23	1,140	22	1,040
14	26	2,280	27	5,470	30	3,910	49	7,850	21	952	23	1,140
15	36	3,100	24	5,330	32	4,320	46	6,960	19	857	23	1,120
16	42	3,580	22	5,280	34	4,780	41	5,770	19	890	25	1,320
17	41	3,550	20	5,130	38	5,320	39	5,470	20	983	22	1,060
18	43	4,440	18	5,070	37	5,010	39	5,500	20	887	20	826
19	45	5,690	19	5,560	36	4,630	40	5,570	19	732	20	914
20	47	7,830	20	6,210	36	4,370	40	5,600	23	838	21	1,040
21	46	8,690	21	6,220	35	4,080	38	5,170	25	925	22	1,090
22	36	7,300	21	6,140	35	3,820	37	4,690	25	1,420	23	1,190
23	28	6,050	22	5,980	35	3,310	35	4,200	26	1,570	21	1,120
24	26	5,760	23	5,900	35	3,070	33	3,700	27	1,450	20	942
25	24	5,530	24	5,850	30	2,770	31	3,350	27	1,050	19	1,020
26	22	5,240	24	5,760	33	3,200	29	2,920	24	842	19	902
27	20	4,890	24	5,600	36	3,630	27	2,760	21	703	19	682
28	19	4,520	23	5,330	40	4,610	25	2,440	22	719	19	605
29	21	4,910	26	5,600	43	5,870	23	1,950	23	714	18	646
30	25	5,810	29	6,150	46	6,760	17	1,260	25	749	17	713
31	---	---	32	6,610	---	---	22	1,400	27	913	---	---
TOTAL	---	123,520	---	176,160	---	138,430	---	169,670	---	35,844	---	27,134
YEAR	948,231											

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05411500 MISSISSIPPI RIVER AT CLAYTON, IA

LOCATION.--Lat 42°54'13", long 91°08'45", NE$^1/_4$ NW$^1/_4$ sec.1, T.93 N., R.3 W., Clayton County, Hydrologic Unit 07060003, 6 miles below the Wisconsin River.

DRAINAGE AREA.--79,200 mi^2.

PERIOD OF RECORD.--April 1930 to June 1936, January 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 602.60 ft above NGVD of 1929.

REMARKS.--Records good. U.S. Geological Survey satellite data collection platform with telephone modem at station.

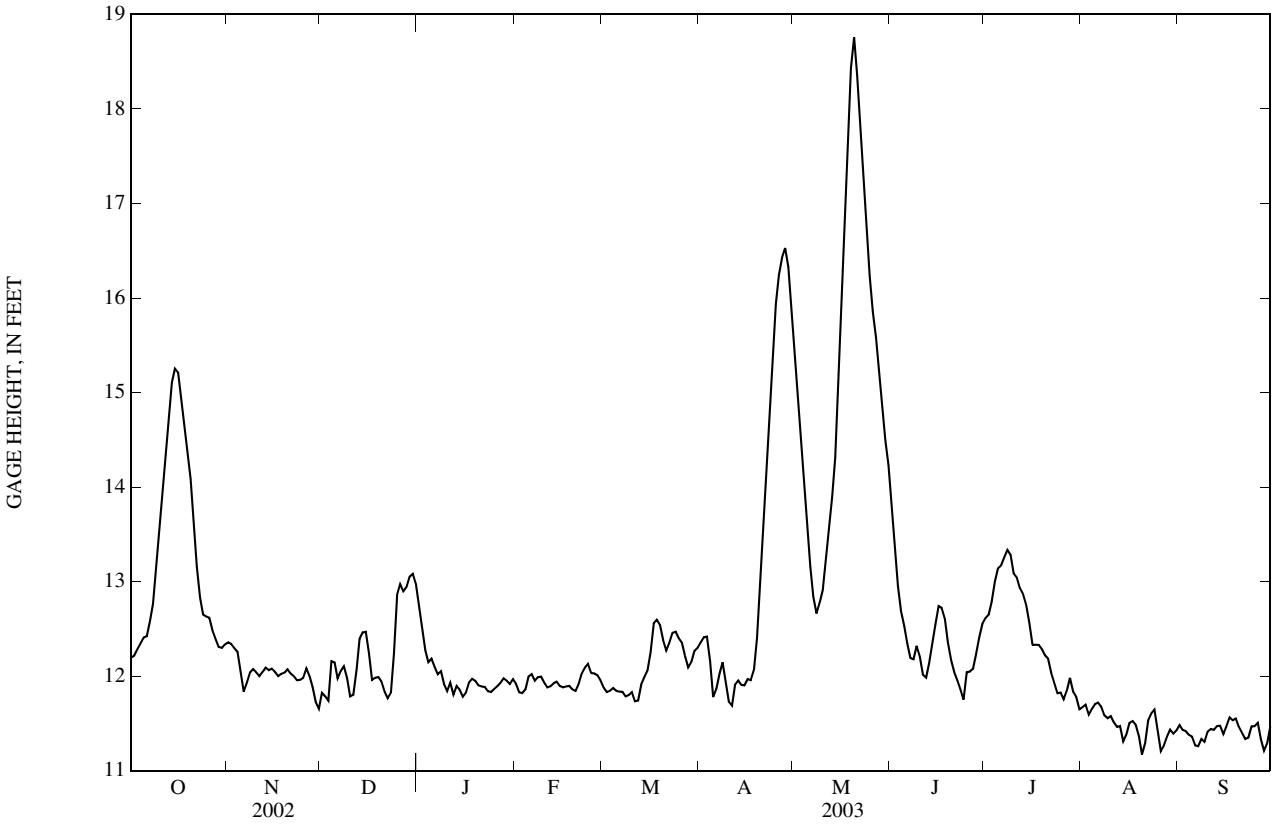
EXTREMES FOR CURRENT WATER YEAR.--Maximum gage height 18.85 ft May 20; minimum gage height 11.11 ft Aug. 20.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height 25.48 ft Apr. 20, 2001; minimum gage height 11.11 ft Aug. 20, 2003.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.20	12.36	11.82	12.76	11.92	11.88	12.36	15.49	13.86	12.61	11.67	11.48
2	12.22	12.34	11.79	12.52	11.83	11.83	12.41	15.08	13.38	12.65	11.70	11.43
3	12.28	12.29	11.74	12.27	11.82	11.85	12.42	14.68	12.95	12.79	11.59	11.42
4	12.35	12.26	12.16	12.15	11.86	11.87	12.16	14.26	12.69	13.00	11.65	11.38
5	12.41	12.03	12.14	12.18	11.99	11.84	11.78	13.77	12.53	13.14	11.70	11.36
6	12.42	11.83	11.98	12.10	12.02	11.84	11.87	13.16	12.35	13.17	11.72	11.27
7	12.58	11.93	12.06	12.02	11.95	11.83	12.03	12.84	12.19	13.26	11.68	11.26
8	12.76	12.04	12.11	12.05	11.99	11.79	12.15	12.66	12.18	13.33	11.59	11.34
9	13.19	12.07	11.98	11.92	12.00	11.80	11.94	12.78	12.32	13.28	11.56	11.31
10	13.55	12.04	11.79	11.84	11.93	11.83	11.73	12.91	12.21	13.09	11.58	11.41
11	14.01	12.00	11.80	11.93	11.88	11.73	11.69	13.25	12.01	13.04	11.51	11.44
12	14.37	12.04	12.06	11.80	11.89	11.74	11.91	13.58	11.98	12.93	11.46	11.43
13	14.72	12.09	12.39	11.89	11.92	11.91	11.95	13.90	12.14	12.87	11.47	11.47
14	15.11	12.06	12.46	11.86	11.94	11.99	11.91	14.31	12.34	12.76	11.31	11.48
15	15.25	12.08	12.47	11.78	11.90	12.06	11.90	14.93	12.55	12.56	11.38	11.39
16	15.21	12.04	12.24	11.82	11.88	12.25	11.97	15.65	12.74	12.33	11.51	11.47
17	14.96	12.00	11.96	11.93	11.89	12.56	11.96	16.56	12.72	12.33	11.53	11.56
18	14.66	12.02	11.98	11.97	11.90	12.60	12.07	17.55	12.61	12.33	11.49	11.53
19	14.39	12.04	11.99	11.95	11.86	12.54	12.40	18.43	12.36	12.29	11.36	11.55
20	14.09	12.07	11.94	11.90	11.84	12.38	12.90	18.76	12.17	12.22	11.17	11.46
21	13.68	12.03	11.84	11.89	11.91	12.27	13.52	18.35	12.04	12.19	11.29	11.40
22	13.16	12.00	11.77	11.88	12.03	12.36	14.07	17.77	11.96	12.03	11.53	11.34
23	12.83	11.96	11.83	11.84	12.09	12.46	14.73	17.24	11.86	11.92	11.61	11.35
24	12.65	11.96	12.24	11.83	12.13	12.47	15.40	16.73	11.75	11.82	11.64	11.47
25	12.63	11.98	12.86	11.86	12.03	12.40	15.94	16.24	12.04	11.83	11.43	11.47
26	12.62	12.08	12.97	11.89	12.03	12.35	16.24	15.85	12.05	11.76	11.21	11.51
27	12.48	12.00	12.90	11.93	12.01	12.21	16.43	15.58	12.08	11.85	11.26	11.34
28	12.39	11.88	12.94	11.98	11.96	12.09	16.53	15.22	12.24	11.98	11.36	11.21
29	12.31	11.73	13.05	11.95	---	12.15	16.33	14.88	12.41	11.84	11.44	11.29
30	12.30	11.66	13.08	11.92	---	12.27	15.90	14.50	12.55	11.78	11.39	11.47
31	12.34	---	12.98	11.97	---	12.30	---	14.23	---	11.65	11.42	---
MEAN	13.29	12.03	12.24	11.99	11.94	12.11	13.22	15.20	12.38	12.47	11.49	11.41
MAX	15.25	12.36	13.08	12.76	12.13	12.60	16.53	18.76	13.86	13.33	11.72	11.56
MIN	12.20	11.66	11.74	11.78	11.82	11.73	11.69	12.66	11.75	11.65	11.17	11.21

05411500 MISSISSIPPI RIVER AT CLAYTON, IA—Continued



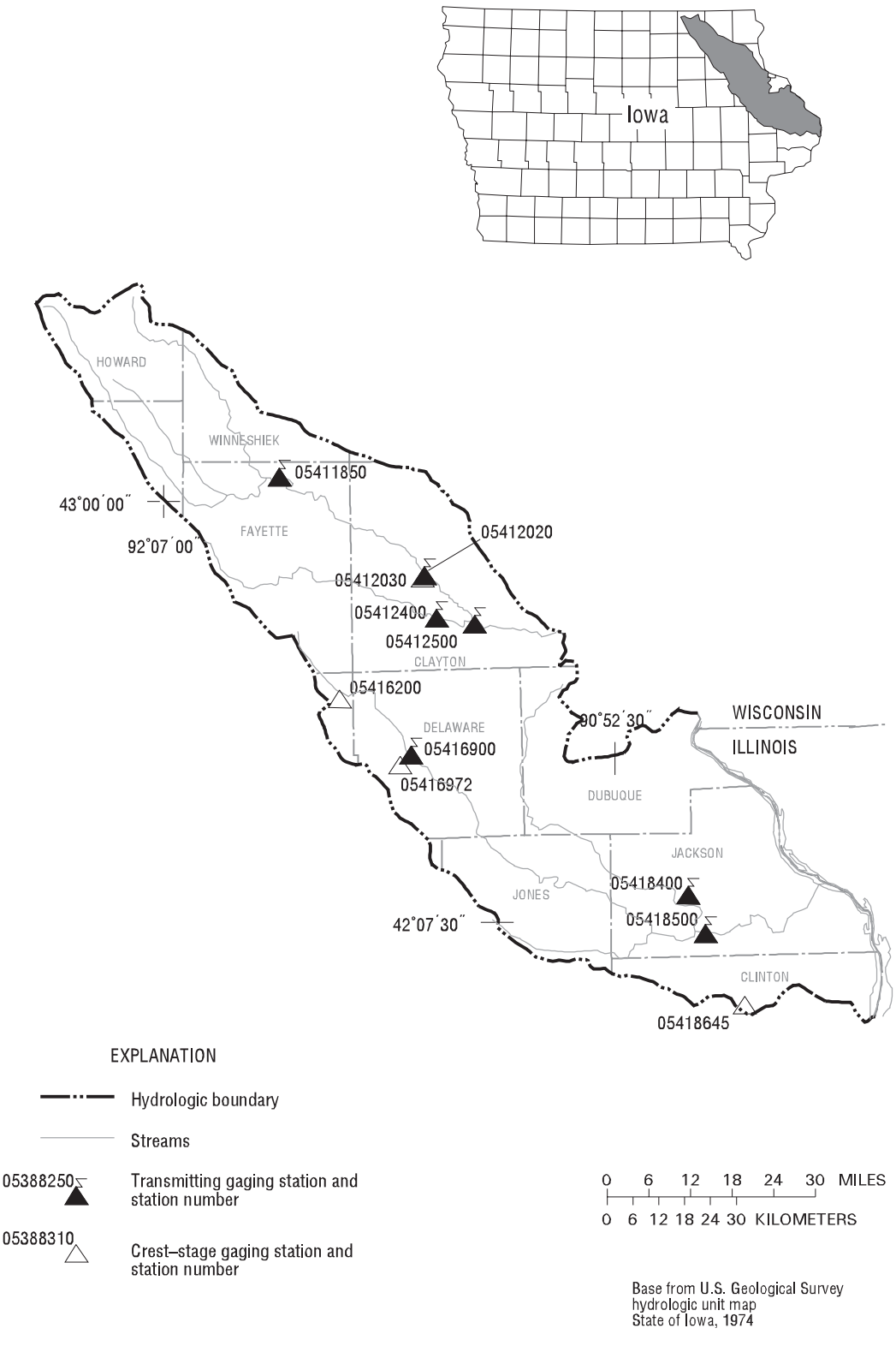


Figure 7. Locations of active continuous-record and crest-stage gaging stations in the Turkey River and Maquoketa River drainage basins.

Gaging Stations

05411850 Turkey River near Eldorado, IA 66
05412020 Turkey River above French Hollow Creek at Elkader, IA 68
05412400 Volga River at Littleport, IA 70
05412500 Turkey River at Garber, IA 72
05416900 Maquoketa River at Manchester, IA 74
05418400 North Fork Maquoketa River near Fulton, IA 76
05418500 Maquoketa River near Maquoketa, IA 78

Crest Stage Gaging Stations

05412030 French Hollow Creek near Elkader, IA 456
05416200 Lamont Creek Tributary near Lamont, IA 457
05416972 Sand Creek near Manchester, IA 457
05418645 Williams Creek near Charlotte, IA 457

05411850 TURKEY RIVER NEAR ELDORADO, IA

LOCATION.--Lat 43°03'15", long 91°48'32", in NW¼ SE¼ SE¼ sec.8, T.95 N., R.8 W., Fayette County, Hydrologic Unit 07060004, on left bank 5 ft. downstream of bridge on County Highway B40, 3.6 miles downstream of confluence with the Little Turkey River, 3.4 upstream of Dry Branch Creek, and 1.4 miles east of Eldorado.

DRAINAGE AREA.--641 mi^2.

PERIOD OF RECORD.--September 27, 2000 to current year.

GAGE.--Water-stage recorder. Datum of gage is 890.00 ft. above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 15, 1991, gage height 18.78 ft, discharge not determined; flood discharge at downstream site at Garber was 49,900 ft^3/s; flood of May 19, 1999 at downstream site at Garber was 53,900 ft^3/s, gage height 30.91 ft. This is the highest known flood in the basin.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	114	119	e88	e77	e43	e48	179	372	257	233	129	63
2	116	119	e85	e76	e45	e42	172	345	244	207	128	62
3	124	119	e83	e78	e47	e44	167	312	240	192	128	62
4	135	120	e86	e77	e40	e46	167	303	225	191	122	61
5	140	119	e83	e79	e40	e46	167	455	213	195	119	59
6	156	119	e80	e81	e39	e46	164	862	237	180	117	59
7	149	118	e88	91	e39	e46	167	1,140	304	337	113	58
8	145	119	e86	91	e38	e42	168	1,130	403	485	109	57
9	142	119	e89	e79	e38	e40	166	1,720	486	517	106	55
10	139	118	e93	e63	e37	e39	168	1,920	471	549	108	54
11	134	117	e89	e58	e38	e44	183	1,930	439	587	111	54
12	132	116	e92	e57	e36	e60	228	1,550	401	546	106	69
13	129	115	e90	e55	e37	e92	277	1,570	372	451	101	69
14	127	114	e94	e53	e39	e137	280	1,210	341	385	97	66
15	127	113	e96	e51	e41	e176	266	1,190	310	334	95	64
16	125	111	e92	e50	e40	e248	272	1,290	276	288	94	61
17	126	110	111	e47	e42	e377	280	1,100	247	248	90	57
18	126	110	133	e46	e48	e287	297	911	230	211	85	57
19	125	111	141	e46	e55	e252	331	796	210	185	82	71
20	122	111	130	e43	e60	e233	413	702	188	176	82	68
21	123	111	e98	e43	e63	e221	514	601	178	189	79	66
22	121	110	e85	e40	e62	e211	502	532	171	178	75	71
23	120	109	e76	e36	e50	206	453	491	167	165	74	68
24	122	108	e76	e37	e39	197	411	456	178	157	74	62
25	125	e95	e80	e39	e37	172	377	423	221	151	71	59
26	124	e88	e81	e38	e40	161	347	389	345	146	71	61
27	122	e80	e76	e39	e47	169	321	358	311	142	71	63
28	123	e86	e78	e42	e54	178	298	336	318	138	70	61
29	122	e92	e81	e41	---	195	275	312	313	134	66	59
30	121	e84	e81	e41	---	221	297	301	271	132	65	58
31	120	---	e80	e42	---	197	---	287	---	129	64	---
MEAN	128	109	91.0	56.0	44.1	144	277	816	286	263	93.6	61.8
MAX	156	120	141	91	63	377	514	1,930	486	587	129	71
MIN	114	80	76	36	36	39	164	287	167	129	64	54
AC-FT	7,890	6,510	5,600	3,440	2,450	8,870	16,480	50,170	16,990	16,180	5,760	3,680
CFSM	0.20	0.17	0.14	0.09	0.07	0.23	0.43	1.27	0.45	0.41	0.15	0.10
IN.	0.23	0.19	0.16	0.10	0.07	0.26	0.48	1.47	0.50	0.47	0.17	0.11

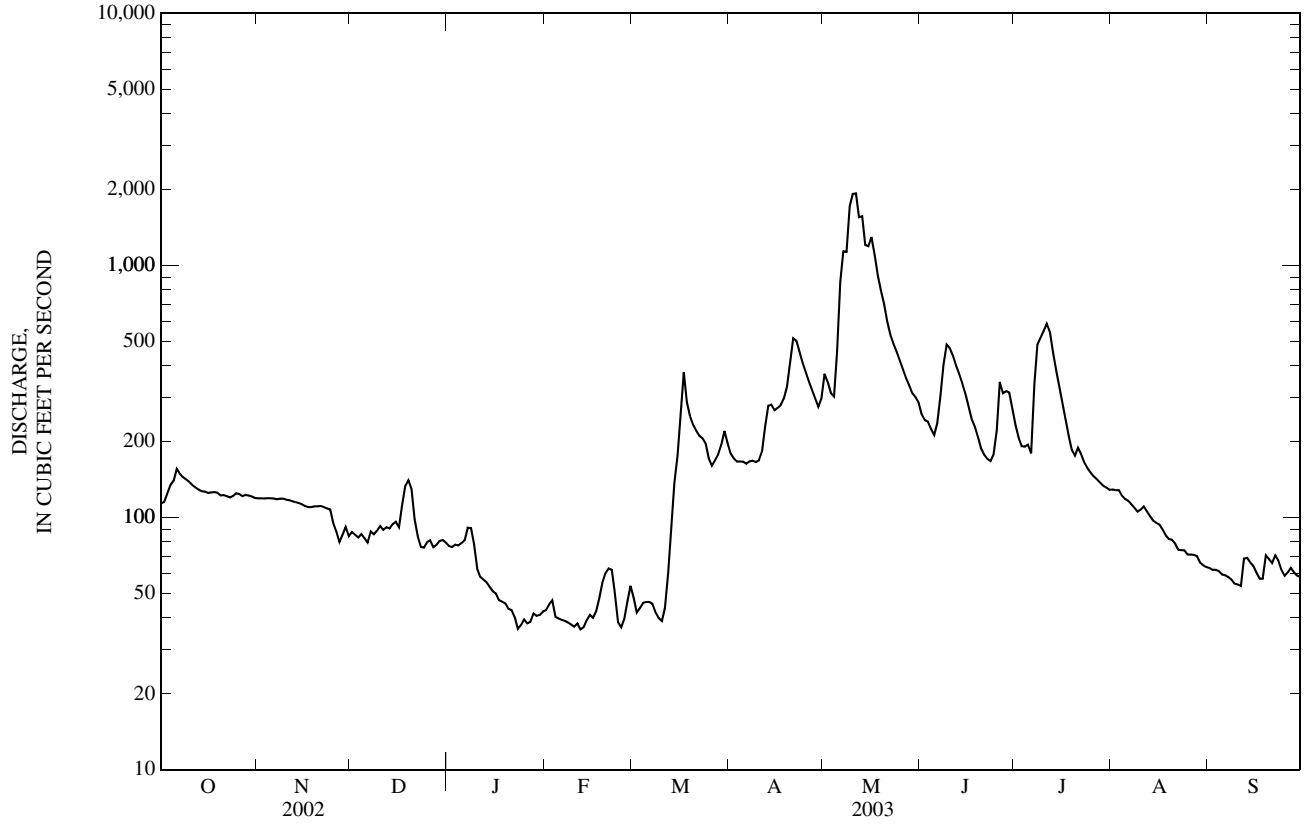
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2003, BY WATER YEAR (WY)

MEAN	161	178	120	93.3	126	401	1,127	1,052	496	251	176	127
MAX	188	270	147	123	182	883	2,764	1,814	656	263	284	196
(WY)	(2002)	(2001)	(2002)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2003)	(2002)	(2001)
MIN	128	109	91.0	56.0	44.1	144	277	526	286	229	93.6	61.8
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2002)	(2003)	(2001)	(2003)	(2003)

05411850 TURKEY RIVER NEAR ELDORADO, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2000 - 2003	
ANNUAL MEAN	237		199		360	
HIGHEST ANNUAL MEAN					630	2001
LOWEST ANNUAL MEAN					199	2003
HIGHEST DAILY MEAN	2,040	Jul 30	1,930	May 11	6,970	Apr 12, 2001
LOWEST DAILY MEAN	75	Jan 18	36	Jan 23a	36	Jan 23, 2003a
ANNUAL SEVEN-DAY MINIMUM	78	Dec 23	38	Feb 7	38	Feb 7, 2003
MAXIMUM PEAK FLOW			2,150	May 11	7,520	Apr 12, 2001
MAXIMUM PEAK STAGE			8.43	May 11	13.93	Apr 12, 2001
ANNUAL RUNOFF (AC-FT)	171,300		144,000		260,500	
ANNUAL RUNOFF (CFSM)	0.37		0.31		0.56	
ANNUAL RUNOFF (INCHES)	5.01		4.21		7.62	
10 PERCENT EXCEEDS	538		402		770	
50 PERCENT EXCEEDS	142		119		162	
90 PERCENT EXCEEDS	90		45		76	

a Ice affected; Also Feb. 12.
e Estimated.



05412020 TURKEY RIVER ABOVE FRENCH HOLLOW CREEK AT ELKADER, IA

LOCATION.--Lat 42°50'36", long 91°24'04", in NW¼ SE¼ sec.26, T.93 N., R.05 W., Clayton County, Hydrologic Unit 07060004, on left bank 5 ft. downstream of bridge on State Highway 13, and 100 ft upstream of the mouth of French Hollow Creek.

DRAINAGE AREA.--891 mi^2.

PERIOD OF RECORD.--August 28, 2001 to September 30, 2002.

GAGE.--Water-stage recorder. Datum of gage is 694.93 ft. above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 15, 1991, gage height and discharge not determined; flood discharge at downstream site at Garber was 49,900 ft^3/s; flood of May 19, 1999 at downstream site at Garber was 53,900 ft^3/s, gage height 30.91 ft. This is the highest known flood in the basin.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	188	193	e141	e135	e69	e86	265	604	466	409	224	132
2	200	190	e137	e129	e73	e74	252	568	446	377	220	130
3	199	191	e133	e131	e77	e73	241	503	439	355	223	127
4	243	192	e134	e132	e69	e79	236	471	426	350	221	124
5	247	197	e136	e129	e66	e88	235	656	403	392	210	122
6	249	202	e132	e131	e64	e93	230	810	410	376	204	119
7	276	202	e137	144	e64	e96	235	1,210	479	536	200	115
8	270	201	e133	160	e62	e89	237	1,380	545	705	195	112
9	264	198	e138	e139	e62	e83	236	1,860	604	747	191	109
10	255	200	e141	e100	e61	e81	241	2,400	653	757	187	106
11	243	197	e140	e96	e62	e89	252	2,820	635	756	200	104
12	234	197	e141	e88	e60	e102	265	2,290	598	771	189	111
13	220	194	e140	e79	e63	e140	292	2,030	560	708	182	134
14	212	192	e143	e75	e66	e190	318	1,930	532	621	176	141
15	207	190	e146	e74	e68	e254	319	1,630	494	557	173	125
16	203	184	e142	e72	e65	e361	314	1,600	460	497	170	119
17	202	184	190	e66	e66	423	314	1,580	428	450	166	116
18	203	180	192	e64	e73	395	317	1,360	404	413	161	117
19	197	181	208	e62	e82	398	372	1,190	381	377	158	140
20	197	184	209	e59	e106	375	457	1,070	357	350	158	138
21	196	186	e161	e58	e151	332	517	957	334	333	159	138
22	194	182	e135	e57	e158	296	594	872	317	335	153	140
23	189	181	e125	e53	e105	283	582	809	304	319	149	136
24	193	175	e123	e56	e76	278	538	758	323	298	145	135
25	210	171	e129	e56	e69	268	493	708	351	285	145	128
26	215	e152	e131	e55	e74	246	455	660	546	273	153	125
27	204	e144	e129	e56	e80	244	420	614	529	263	148	125
28	207	e146	e127	e63	e88	258	390	587	509	254	142	123
29	211	e148	e130	e61	---	252	362	543	483	246	139	126
30	205	e147	e136	e63	---	257	399	518	454	239	136	123
31	200	---	e138	e66	---	275	---	494	---	229	133	---
TOTAL	6,733	5,481	4,477	2,709	2,179	6,558	10,378	35,482	13,870	13,578	5,410	3,740
MEAN	217	183	144	87.4	77.8	212	346	1,145	462	438	175	125
MAX	276	202	209	160	158	423	594	2,820	653	771	224	141
MIN	188	144	123	53	60	73	230	471	304	229	133	104
AC-FT	13,350	10,870	8,880	5,370	4,320	13,010	20,580	70,380	27,510	26,930	10,730	7,420
CFSM	0.24	0.20	0.16	0.10	0.09	0.23	0.38	1.27	0.51	0.49	0.19	0.14
IN.	0.28	0.23	0.18	0.11	0.09	0.27	0.43	1.46	0.57	0.56	0.22	0.15

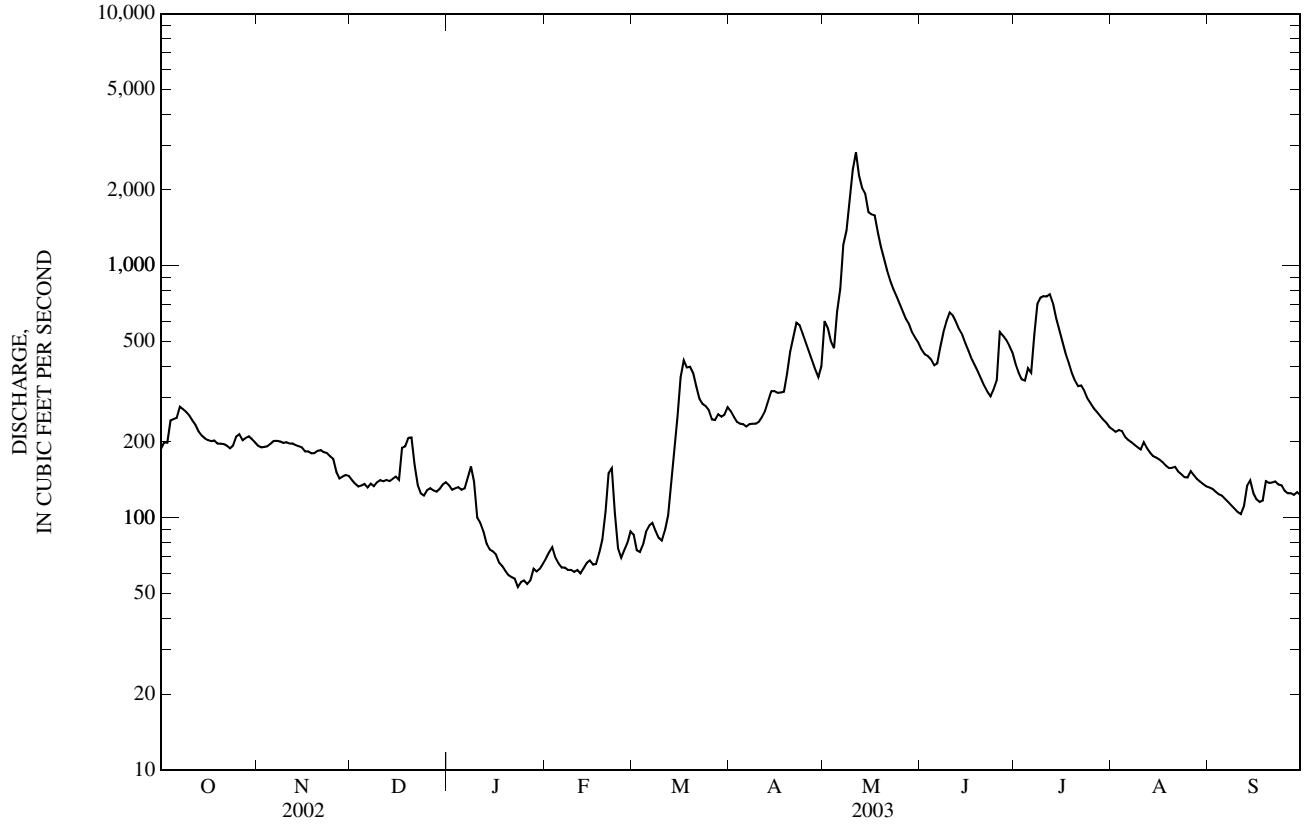
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2003, BY WATER YEAR (WY)

MEAN	299	238	220	153	190	275	438	933	641	413	365	174
MAX	380	294	295	218	303	338	530	1,145	820	438	556	224
(WY)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2003)	(2002)	(2003)	(2002)	(2002)
MIN	217	183	144	87.4	77.8	212	346	721	462	388	175	125
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2002)	(2003)	(2002)	(2003)	(2003)

05412020 TURKEY RIVER ABOVE FRENCH HOLLOW CREEK AT ELKADER, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2001 - 2003	
ANNUAL TOTAL	141,281		110,595			
ANNUAL MEAN	387		303		363	
HIGHEST ANNUAL MEAN					423	2002
LOWEST ANNUAL MEAN					303	2003
HIGHEST DAILY MEAN	1,510	Jun 6	2,820	May 11	2,820	May 11, 2003
LOWEST DAILY MEAN	123	Dec 24	53	Jan 23a	53	Jan 23, 2003a
ANNUAL SEVEN-DAY MINIMUM	128	Dec 23	56	Jan 21	56	Jan 21, 2003
MAXIMUM PEAK FLOW			3,320	May 11	3,320	May 11, 2003
MAXIMUM PEAK STAGE			8.85	May 11	8.85	May 11, 2003
ANNUAL RUNOFF (AC-FT)	280,200		219,400		262,900	
ANNUAL RUNOFF (CFSM)	0.43		0.34		0.40	
ANNUAL RUNOFF (INCHES)	5.82		4.56		5.46	
10 PERCENT EXCEEDS	769		590		708	
50 PERCENT EXCEEDS	271		197		274	
90 PERCENT EXCEEDS	179		74		123	

a Ice affected
e Estimated



05412400 VOLGA RIVER AT LITTLEPORT, IA

LOCATION.--Lat 42°45'15", long 91°22'10", in NE¼ NE¼ SE¼ sec.25, T.92 N., R.5 W., Clayton County, Hydrologic Unit 07060004, on left bank 10 ft. downstream of bridge on County Highway X21, 6 miles upstream of confluence with the Turkey River, and 8.0 miles southeast of Elkader.

DRAINAGE AREA.--348 mi^2.

PERIOD OF RECORD.--September 1957 to July 1977 as miscellaneous low-flow site. September 19, 1999 to current year.

GAGE.--Water-stage recorder. Datum of gage is 677.00 ft. above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 17, 1999 reached a stage of 25.36 ft, approximate discharge 30,000 cfs. (from indirect measurement at Mederville, 2.5 miles upstream of Littleport)

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	85	e40	e38	e34	e41	69	229	153	160	e96	50
2	98	83	e36	e34	e36	e37	67	328	144	141	e87	49
3	112	80	e33	e33	e38	e37	67	312	146	133	e82	49
4	140	80	e40	e38	e40	e38	68	269	141	128	80	49
5	168	83	e32	e36	e37	e42	73	378	135	225	77	48
6	152	84	e29	e38	e35	e44	71	524	139	250	75	47
7	138	81	e41	e44	e35	e48	75	608	159	720	68	47
8	123	80	e36	e53	e35	e42	79	596	196	1,490	68	47
9	117	79	e33	e46	e34	e40	78	821	245	1,570	66	47
10	110	78	e37	e35	e35	e37	83	1,240	255	1,360	64	47
11	104	77	e35	e32	e37	e46	98	1,460	238	1,010	63	47
12	97	77	e46	e30	e35	e61	122	1,090	217	728	62	49
13	91	74	e41	e29	e40	e101	130	755	198	550	60	53
14	86	72	e44	e28	e42	e133	123	663	214	425	60	59
15	83	71	e48	e25	e43	e167	114	675	194	353	59	56
16	80	69	e46	e24	e40	187	109	629	174	297	59	54
17	79	67	62	e23	e39	163	105	527	160	255	59	52
18	79	67	65	e23	e43	141	97	450	151	223	59	52
19	77	66	68	e21	e47	120	103	395	142	193	60	57
20	75	66	66	e23	e50	120	163	356	132	170	60	59
21	76	66	63	e22	e82	105	149	325	121	275	58	55
22	73	65	61	e20	e87	90	151	311	109	284	57	57
23	71	64	e33	e23	e49	81	141	298	104	234	57	56
24	74	62	e38	e26	e38	77	129	275	142	189	56	55
25	86	61	e38	e24	e35	73	119	252	207	164	56	54
26	91	e47	e41	e23	e39	68	110	227	231	153	59	54
27	83	e36	e35	e28	e41	71	102	202	293	139	55	55
28	87	e41	e38	e29	e46	79	95	191	251	127	53	54
29	89	e52	e42	e30	---	78	88	179	213	114	53	54
30	86	e38	e44	e32	---	73	122	173	184	106	51	54
31	85	---	e44	e32	---	70	---	164	---	91	50	---
TOTAL	2,987	2,051	1,355	942	1,192	2,510	3,100	14,902	5,388	12,257	1,969	1,566
MEAN	96.4	68.4	43.7	30.4	42.6	81.0	103	481	180	395	63.5	52.2
MAX	168	85	68	53	87	187	163	1,460	293	1,570	96	59
MIN	71	36	29	20	34	37	67	164	104	91	50	47
AC-FT	5,920	4,070	2,690	1,870	2,360	4,980	6,150	29,560	10,690	24,310	3,910	3,110
CFSM	0.28	0.20	0.13	0.09	0.12	0.23	0.30	1.38	0.52	1.14	0.18	0.15
IN.	0.32	0.22	0.14	0.10	0.13	0.27	0.33	1.59	0.58	1.31	0.21	0.17

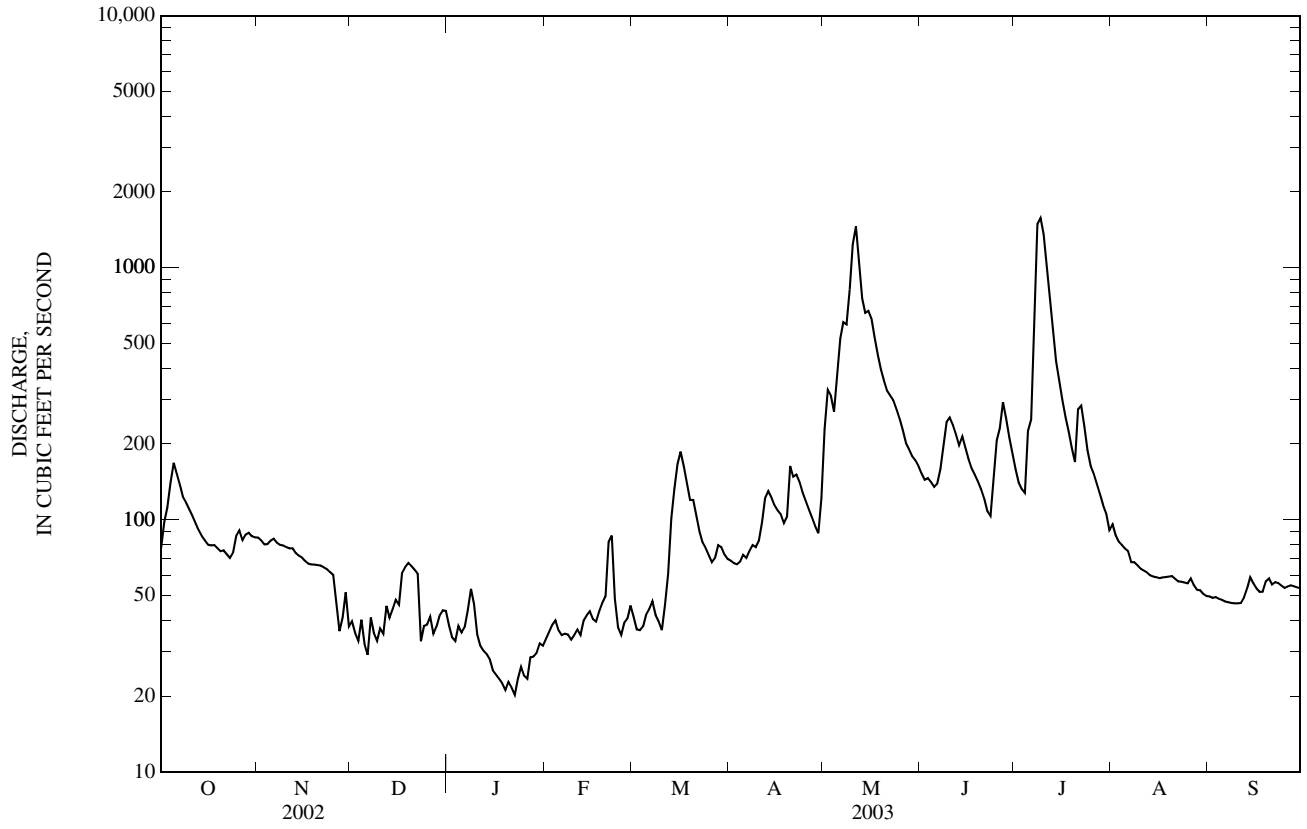
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2003, BY WATER YEAR (WY)

MEAN	115	110	80.2	56.2	115	265	303	429	417	267	111	113
MAX	186	144	150	89.2	175	649	590	680	628	395	138	246
(WY)	(2002)	(2002)	(2002)	(2002)	(2000)	(2001)	(2001)	(2001)	(2000)	(2003)	(2000)	(2001)
MIN	68.5	68.4	43.7	30.4	42.6	81.0	103	270	180	121	63.5	52.2
(WY)	(2001)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2000)	(2003)	(2002)	(2003)	(2003)

05412400 VOLGA RIVER AT LITTLEPORT, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2000 - 2003	
ANNUAL TOTAL	59,728		50,219			
ANNUAL MEAN	164		138		199	
HIGHEST ANNUAL MEAN					270	2001
LOWEST ANNUAL MEAN					138	2003
HIGHEST DAILY MEAN	3,150	Jun 5	1,570	Jul 9	3,150	Jun 5, 2002
LOWEST DAILY MEAN	29	Dec 6	20	Jan 22a	20	Jan 22, 2003a
ANNUAL SEVEN-DAY MINIMUM	35	Dec 5	22	Jan 17	22	Jan 17, 2003
MAXIMUM PEAK FLOW			3,750	May 10	3,810	Jun 4, 2002
MAXIMUM PEAK STAGE			12.99	May 10	13.11	Jun 4, 2002
ANNUAL RUNOFF (AC-FT)	118,500		99,610		143,900	
ANNUAL RUNOFF (CFSM)	0.47		0.40		0.57	
ANNUAL RUNOFF (INCHES)	6.38		5.37		7.75	
10 PERCENT EXCEEDS	271		261		408	
50 PERCENT EXCEEDS	107		73		120	
90 PERCENT EXCEEDS	58		35		47	

a Ice effected
e Estimated



05412500 TURKEY RIVER AT GARBER, IA

LOCATION.--Lat 42°44'24", long 91°15'42", in SE$^1/_4$ NW$^1/_4$ sec.36, T.92 N., R.4 W., Clayton County, Hydrologic Unit 07060004, on right bank 10 ft. upstream from bridge on county highway C43, 800 ft. upstream from Wayman Creek, 1,000 ft. southeast of Garber, 2,000 ft. downstream from Elk Creek, 1 mi downstream from Volga River, and 21.2 mi upstream from mouth.

DRAINAGE AREA.--1,545 mi^2.

PERIOD OF RECORD.--August 1913 to November 1916, May 1919 to September 1927, April 1929 to September 1930, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1922-25 (M), 1927 (M). WSP 1438: Drainage area; WDR IA-95-1: location.

GAGE.--Water-stage recorder. Datum of gage is 634.46 ft. above NGVD of 1929. Prior to Feb. 7, 1935, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, that of May 17, 1999.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	336	351	e245	e250	e204	e283	380	977	769	724	e527	218
2	521	350	e227	e239	e208	e288	362	1,100	725	690	e503	215
3	426	354	e210	e240	e216	e281	344	1,020	712	667	e471	213
4	530	356	e214	e245	e208	e276	340	899	693	654	e466	206
5	533	366	e219	e237	e209	e275	341	1,100	656	913	e449	204
6	500	372	e215	e236	e200	e275	332	1,480	643	776	e434	201
7	489	363	e228	e241	e196	e278	346	2,320	719	1,470	e419	199
8	483	361	e210	e279	e190	e274	348	2,450	851	3,540	e397	195
9	469	361	e219	e261	e197	e272	345	3,210	945	3,160	e399	192
10	454	364	e227	e216	e197	e265	357	4,110	1,010	2,700	e387	188
11	432	353	e229	e200	e200	e283	383	6,450	991	2,270	e375	183
12	414	346	e227	e190	e193	e330	415	4,530	923	1,950	e360	187
13	389	346	e213	e193	e197	e398	445	3,570	855	1,740	e358	220
14	374	343	e225	e184	e204	e707	473	3,430	822	1,500	329	287
15	364	336	e247	e188	e215	e790	477	3,140	776	1,310	325	240
16	353	328	e250	e182	e216	833	471	2,880	706	1,180	318	216
17	353	330	e272	e184	e225	744	461	2,690	652	1,060	310	203
18	353	330	e285	e185	e235	637	453	2,350	615	960	299	194
19	352	328	e293	e185	e248	600	480	2,070	580	865	289	235
20	342	334	e297	e178	e284	599	657	1,860	540	817	285	240
21	340	339	e283	e177	e413	538	707	1,670	506	911	277	228
22	335	336	e259	e172	e477	480	788	1,530	479	925	266	234
23	332	334	e235	e182	e326	442	802	1,420	465	890	256	233
24	339	332	e225	e191	e296	426	752	1,320	563	822	249	223
25	369	328	e232	e185	e314	416	698	1,230	681	755	247	213
26	390	e288	e238	e187	e297	379	650	1,140	864	682	265	213
27	375	e262	e235	e184	e295	371	611	1,060	940	640	251	218
28	380	e265	e225	e197	e291	385	575	1,000	875	595	236	216
29	375	e266	e233	e193	---	382	534	928	812	562	242	212
30	369	e256	e240	e196	---	365	586	876	771	e547	228	208
31	360	---	e253	e204	---	380	---	833	---	e520	219	---
TOTAL	12,431	9,978	7,410	6,381	6,951	13,252	14,913	64,643	22,139	36,795	10,436	6,434
MEAN	401	333	239	206	248	427	497	2,085	738	1,187	337	214
MAX	533	372	297	279	477	833	802	6,450	1,010	3,540	527	287
MIN	332	256	210	172	190	265	332	833	465	520	219	183
AC-FT	24,660	19,790	14,700	12,660	13,790	26,290	29,580	128,200	43,910	72,980	20,700	12,760
CFSM	0.26	0.22	0.15	0.13	0.16	0.28	0.32	1.35	0.48	0.77	0.22	0.14
IN.	0.30	0.24	0.18	0.15	0.17	0.32	0.36	1.56	0.53	0.89	0.25	0.15

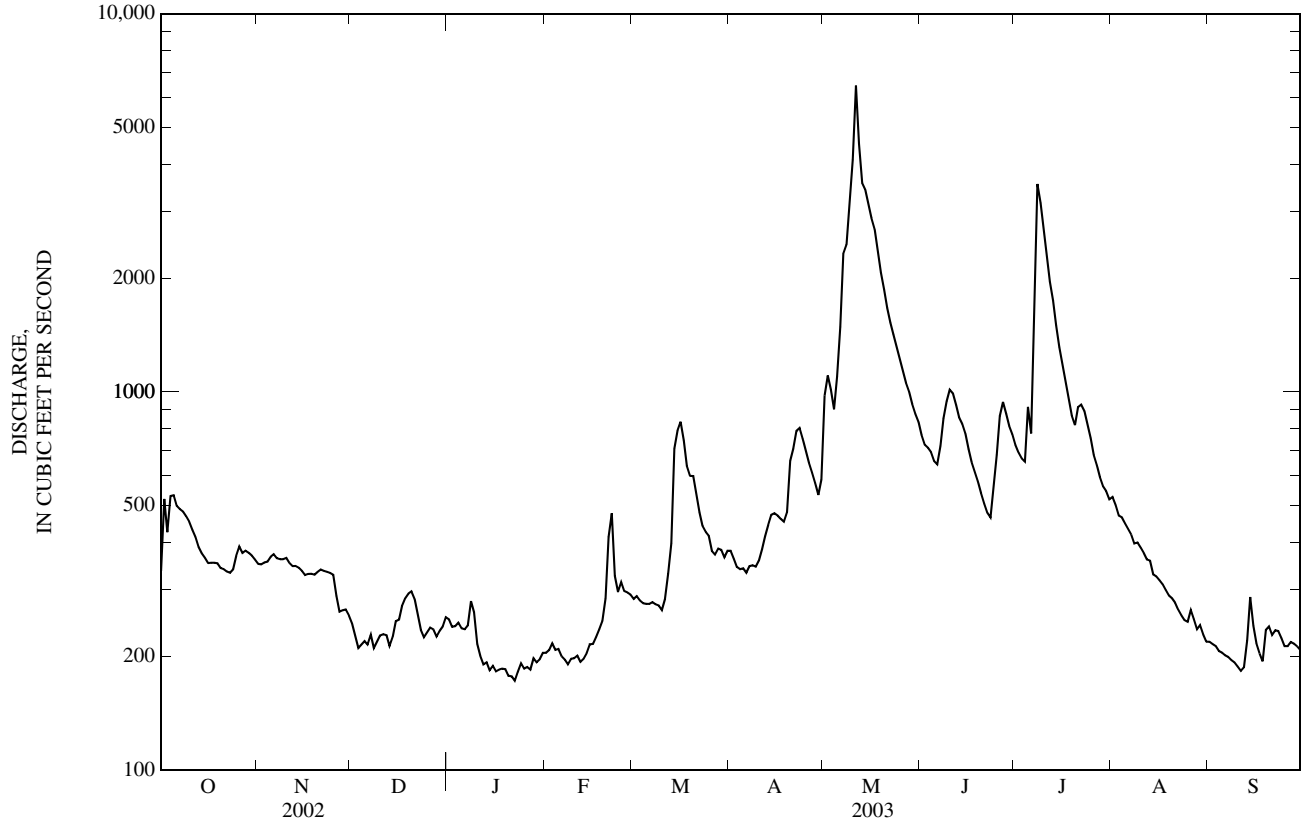
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2003, BY WATER YEAR (WY)

MEAN	574	612	478	502	815	1,991	1,721	1,370	1,415	989	848	633
MAX	2,527	2,834	2,889	3,306	4,265	4,832	6,382	5,176	5,316	5,772	5,119	3,011
(WY)	(1987)	(1962)	(1983)	(1916)	(1922)	(1979)	(1951)	(1999)	(1947)	(1993)	(1993)	(1938)
MIN	88.2	92.2	78.5	62.0	60.9	188	288	95.7	103	121	140	108
(WY)	(1950)	(1950)	(1959)	(1940)	(1959)	(1934)	(1957)	(1934)	(1934)	(1936)	(1964)	(1958)

05412500 TURKEY RIVER AT GARBER, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1913 - 2003	
ANNUAL TOTAL	242,275		211,763			
ANNUAL MEAN	664		580		999	
HIGHEST ANNUAL MEAN					2,905	1993
LOWEST ANNUAL MEAN					249	1934
HIGHEST DAILY MEAN	8,440	Jun 4	6,450	May 11	43,400	May 17, 1999
LOWEST DAILY MEAN	210	Dec 3	172	Jan 22a	49	Jan 28, 1940
ANNUAL SEVEN-DAY MINIMUM	216	Dec 3	180	Jan 16	51	Jan 25, 1940
MAXIMUM PEAK FLOW			10,300	May 11	53,900	May 17, 1999
MAXIMUM PEAK STAGE			17.21	May 11	30.91	May 17, 1999
ANNUAL RUNOFF (AC-FT)	480,600		420,000		723,900	
ANNUAL RUNOFF (CFSM)	0.43		0.38		0.65	
ANNUAL RUNOFF (INCHES)	5.83		5.10		8.79	
10 PERCENT EXCEEDS	1,200		1,010		2,120	
50 PERCENT EXCEEDS	454		352		529	
90 PERCENT EXCEEDS	288		202		171	

a Ice affected
e Estimated



05416900 MAQUOKETA RIVER AT MANCHESTER, IA

LOCATION.--Lat 42°28'12", long 91°26'54", in SW¼ SW¼ SW¼ sec.33, T.89 N., R.5 E., Delaware, Hydrologic Unit 07060006, on left bank, 10 feet downstream of east bound bridge of Highway 20, 1.5 miles upstream of Sand Creek, and 1.5 miles downstream of dam in Manchester.

DRAINAGE AREA.--275 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--April 26, 2000 to December 16, 2002; June 23, 2003 to September 30, 2003.

GAGE.--Water-stage recorder. Datum of gage is 895.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	104	e42	---	---	---	---	---	---	168	e146	71
2	116	103	e65	---	---	---	---	---	---	155	e139	e70
3	150	102	e45	---	---	---	---	---	---	145	e137	e74
4	168	101	e23	---	---	---	---	---	---	158	e134	e69
5	192	103	e27	---	---	---	---	---	---	342	e128	e66
6	171	103	e39	---	---	---	---	---	---	446	123	e65
7	147	100	e28	---	---	---	---	---	---	927	118	e65
8	132	100	e33	---	---	---	---	---	---	1,700	113	e64
9	123	99	e35	---	---	---	---	---	---	2,760	110	62
10	116	99	e45	---	---	---	---	---	---	2,120	105	62
11	110	97	e57	---	---	---	---	---	---	1,480	102	62
12	108	94	e72	---	---	---	---	---	---	970	99	66
13	103	94	e53	---	---	---	---	---	---	684	98	72
14	101	94	e38	---	---	---	---	---	---	522	96	87
15	101	93	e54	---	---	---	---	---	---	445	94	74
16	98	92	e62	---	---	---	---	---	---	365	90	67
17	98	92	---	---	---	---	---	---	---	315	88	66
18	98	93	---	---	---	---	---	---	---	281	85	63
19	95	92	---	---	---	---	---	---	---	249	92	72
20	92	93	---	---	---	---	---	---	---	231	85	67
21	92	93	---	---	---	---	---	---	---	e314	82	67
22	91	91	---	---	---	---	---	---	---	e285	82	70
23	88	90	---	---	---	---	---	---	181	e246	77	67
24	91	89	---	---	---	---	---	---	165	e218	76	64
25	101	87	---	---	---	---	---	---	220	e199	75	62
26	104	86	---	---	---	---	---	---	415	e188	76	64
27	101	e72	---	---	---	---	---	---	333	e181	73	65
28	105	e61	---	---	---	---	---	---	269	e172	72	64
29	105	e69	---	---	---	---	---	---	221	e168	71	62
30	107	e60	---	---	---	---	---	---	188	e156	69	63
31	107	---	---	---	---	---	---	---	---	e159	71	---
TOTAL	3,496	2,746	---	---	---	---	---	---	---	16,749	3,006	2,012
MEAN	113	91.5	---	---	---	---	---	---	---	540	97.0	67.1
MAX	192	104	---	---	---	---	---	---	---	2,760	146	87
MIN	85	60	---	---	---	---	---	---	---	145	69	62
AC-FT	6,930	5,450	---	---	---	---	---	---	---	33,220	5,960	3,990
CFSM	0.41	0.33	---	---	---	---	---	---	---	1.96	0.35	0.24
IN.	0.47	0.37	---	---	---	---	---	---	---	2.27	0.41	0.27

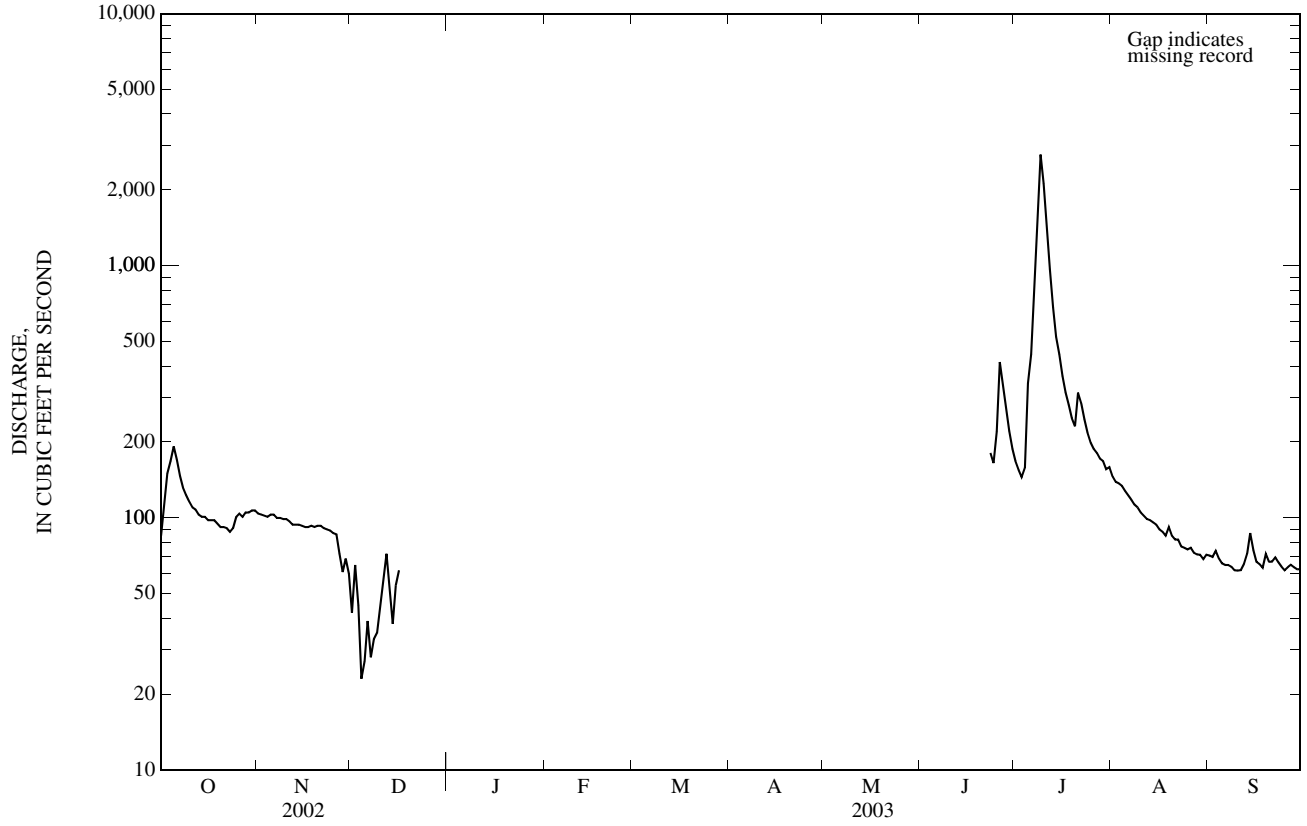
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2003, BY WATER YEAR (WY)

MEAN	140	120	108	83.5	136	405	346	398	769	316	146	137
MAX	230	162	173	115	157	645	474	473	1,005	540	210	302
(WY)	(2002)	(2002)	(2002)	(2002)	(2002)	(2001)	(2001)	(2001)	(2000)	(2003)	(2001)	(2001)
MIN	77.5	91.5	43.4	52.0	115	165	217	280	427	141	97.0	67.1
(WY)	(2001)	(2003)	(2001)	(2001)	(2001)	(2002)	(2002)	(2002)	(2001)	(2002)	(2003)	(2003)

SUMMARY STATISTICS	WATER YEARS 2000 - 2003	
ANNUAL MEAN	244	
HIGHEST ANNUAL MEAN	261	2001
LOWEST ANNUAL MEAN	228	2002
HIGHEST DAILY MEAN	6,790	Jun 5, 2002
LOWEST DAILY MEAN	23	Dec 4, 2002a
ANNUAL SEVEN-DAY MINIMUM	33	Dec 3, 2002
MAXIMUM PEAK FLOW	10,800	Jun 4, 2002
MAXIMUM PEAK STAGE	18.35	Jun 4, 2002
ANNUAL RUNOFF (AC-FT)	177,000	
ANNUAL RUNOFF (CFSM)	0.89	
ANNUAL RUNOFF (INCHES)	12.07	
10 PERCENT EXCEEDS	481	
50 PERCENT EXCEEDS	158	
90 PERCENT EXCEEDS	70	

05416900 MAQUOKETA RIVER AT MANCHESTER, IA—Continued

a Ice affected.
e Estimated



05418400 NORTH FORK MAQUOKETA RIVER NEAR FULTON, IA

LOCATION.--Lat 42°09'52", long 90°40'44", in SW¼ SW¼ SE¼ sec.16, T.85 N., R.2 E., Jackson County, Hydrologic Unit 07060006, on right downstream bank at County Highway E17, 0.25 mile upstream from Prairie Creek, and 7.0 mi northeast of Maquoketa.

DRAINAGE AREA.--505 mi^2.

PERIOD OF RECORD.--April 29, 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 679.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood, Aug. 18, 1981, reached a stage of 17.26 ft, discharge, 10,700 ft^3/s, at site and datum 3.5 miles downstream, in use prior to Oct. 1, 1991.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	387	294	e159	e215	e216	e294	171	456	275	225	e250	158
2	499	290	e192	e212	e216	e292	170	841	267	220	e262	158
3	610	289	e167	e210	e214	e262	171	485	268	222	e262	155
4	900	287	e98	e205	e206	e241	173	387	269	230	e265	150
5	857	286	e109	e204	e213	e241	172	377	264	249	e265	149
6	615	287	e141	e206	e215	e248	167	356	264	330	e244	149
7	503	284	e130	e210	e225	e267	178	336	269	615	221	151
8	435	279	e149	e213	e222	e275	184	326	281	1,050	215	153
9	395	282	e171	e213	e220	e267	176	434	278	2,080	208	145
10	380	281	e182	e206	e216	e269	176	496	273	e1,280	203	141
11	365	278	e223	e204	e209	e272	183	426	267	e842	200	137
12	353	266	e273	e206	e220	e320	192	528	260	e710	196	145
13	343	260	e236	e209	e213	e500	195	399	255	e564	194	182
14	331	261	e216	e204	e211	397	191	433	251	e426	193	373
15	323	261	e231	e206	e209	322	188	589	247	e383	188	336
16	321	256	242	e203	e211	293	186	487	240	e367	189	237
17	318	258	234	e201	e203	247	185	407	237	e344	190	199
18	318	259	257	e204	e200	221	181	363	241	e341	186	176
19	e313	260	278	e201	e214	209	188	334	241	e334	182	169
20	e305	256	261	e197	e250	216	207	308	235	e359	182	161
21	e291	252	249	e196	e300	208	207	277	231	e660	185	158
22	e290	249	243	e200	e337	195	200	253	228	e495	187	165
23	e283	245	e210	e204	e324	183	194	250	224	e343	176	163
24	e288	243	e217	e200	e294	174	190	241	220	e303	172	158
25	e296	237	e222	e197	e272	169	187	234	245	e299	172	151
26	e290	e213	e225	e203	e271	166	184	233	278	e296	171	152
27	e286	e205	e219	e204	e284	167	180	243	267	e296	165	156
28	e290	e196	e218	e209	e299	174	177	280	265	e288	163	154
29	e292	e206	e213	e212	---	176	173	287	252	e277	170	150
30	e294	e197	e215	e213	---	172	213	284	236	e264	164	142
31	298	---	e218	e214	---	169	---	283	---	e251	160	---
TOTAL	12,069	7,717	6,398	6,381	6,684	7,606	5,539	11,633	7,628	14,943	6,180	5,173
MEAN	389	257	206	206	239	245	185	375	254	482	199	172
MAX	900	294	278	215	337	500	213	841	281	2,080	265	373
MIN	283	196	98	196	200	166	167	233	220	220	160	137
AC-FT	23,940	15,310	12,690	12,660	13,260	15,090	10,990	23,070	15,130	29,640	12,260	10,260
CFSM	0.77	0.51	0.41	0.41	0.47	0.49	0.37	0.74	0.50	0.95	0.39	0.34
IN.	0.89	0.57	0.47	0.47	0.49	0.56	0.41	0.86	0.56	1.10	0.46	0.38

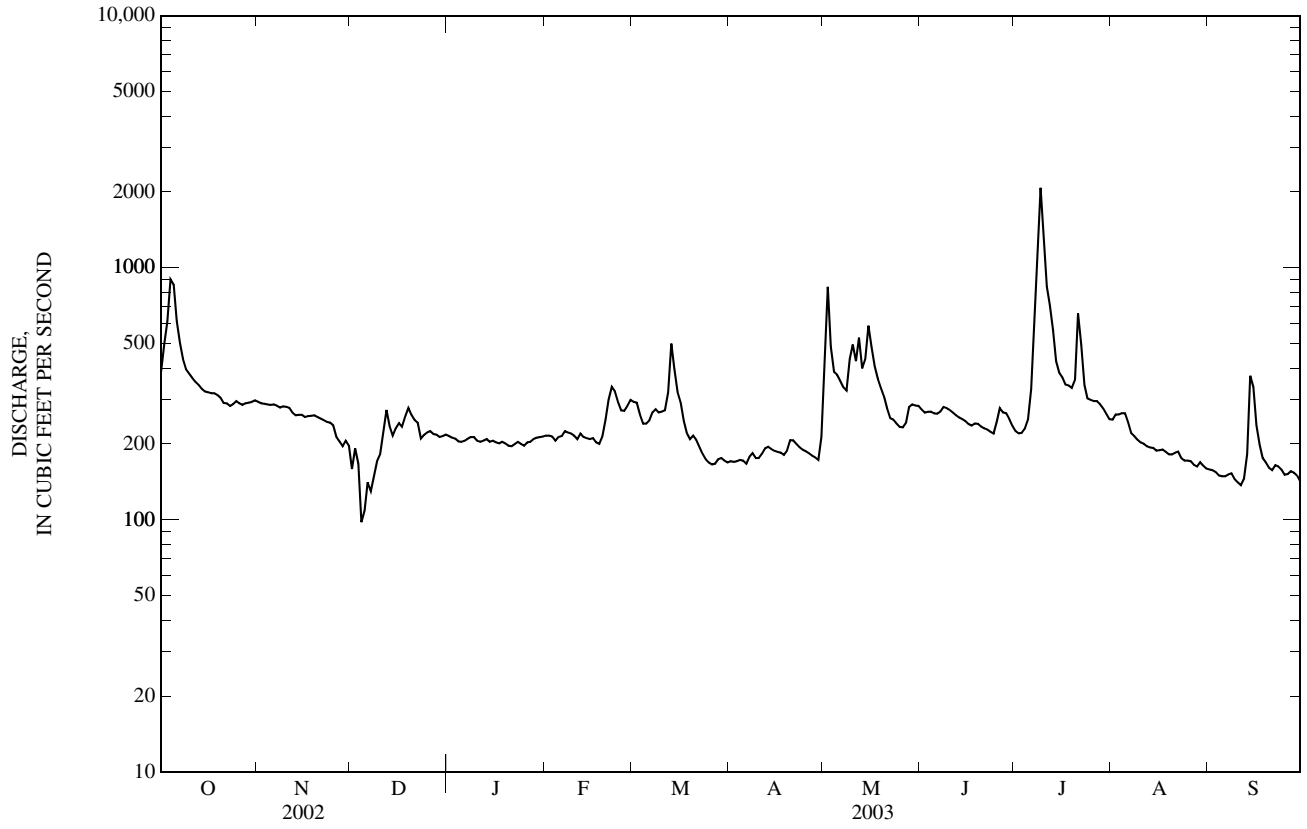
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2003, BY WATER YEAR (WY)

MEAN	335	262	183	152	354	367	443	535	1,053	463	437	288
MAX	490	388	246	214	549	800	857	1,179	2,667	595	1,217	432
(WY)	(1999)	(1999)	(2002)	(2002)	(2001)	(2001)	(1999)	(1999)	(2002)	(2002)	(2002)	(2002)
MIN	199	182	64.5	85.3	195	223	185	312	254	268	199	172
(WY)	(2001)	(2001)	(2001)	(2000)	(2002)	(2000)	(2003)	(2002)	(2003)	(2001)	(2003)	(2003)

05418400 NORTH FORK MAQUOKETA RIVER NEAR FULTON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1998 - 2003	
ANNUAL TOTAL	214,142		97,951			
ANNUAL MEAN	587		268		410	
HIGHEST ANNUAL MEAN					585	2002
LOWEST ANNUAL MEAN					268	2003
HIGHEST DAILY MEAN	20,200	Jun 5	2,080	Jul 9	20,200	Jun 5, 2002
LOWEST DAILY MEAN	98	Dec 4	98	Dec 4a	44	Dec 5, 2000a
ANNUAL SEVEN-DAY MINIMUM	138	Dec 3	138	Dec 3	56	Dec 21, 2000
MAXIMUM PEAK FLOW			3,030	Jul 9	22,600	Jun 5, 2002
MAXIMUM PEAK STAGE			9.22	Jul 9	19.87	Jun 5, 2002
ANNUAL RUNOFF (AC-FT)	424,800		194,300		297,300	
ANNUAL RUNOFF (CFSM)	1.16		0.53		0.81	
ANNUAL RUNOFF (INCHES)	15.77		7.22		11.04	
10 PERCENT EXCEEDS	752		378		665	
50 PERCENT EXCEEDS	287		234		268	
90 PERCENT EXCEEDS	196		167		159	

a Ice affected
e Estimated



05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA

LOCATION.--Lat 42°05'00", long 90°37'58", in SW¼ NE¼ sec.17, T.84 N., R.3 E., Jackson County, Hydrologic Unit 07060006, on right downstream bank at State Highway 62 bridge, 900 ft. upstream from Prairie Creek, 2.0 mi northeast of Maquoketa, 2.2 mi downstream from North Fork, and 26.7 mi upstream from mouth.

DRAINAGE AREA.--1,553 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1913 to current year. Prior to October 1939, published as "below North Fork near Maquoketa". Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 405: 1914. WSP 1438: Drainage area. WSP 1508: 1914-17, 1919-25, 1926 (M), 1929, 1933-34 (M), 1943.

GAGE.--Water-stage recorder. Datum of gage is 625.96 ft. above NGVD of 1929. Prior to July 14, 1924, nonrecording gage, and July 15, 1924 to Sept. 30, 1972, recording gage at site 300 ft. upstream from State Highway 62 bridge at datum 10.00 ft. higher. On Aug. 3, 1995 the gage was moved to the current location.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation caused by power plant 4 mi upstream of station. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood, probably in 1903, reached a stage of 23.5 ft., discharge, 43,000 ft.3/s, at datum in use prior to Oct. 1, 1972.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	910	944	e707	e564	e604	e643	553	874	890	840	762	463
2	2,290	926	e737	e554	e613	e555	580	2,080	849	798	768	457
3	1,960	923	e682	e550	e613	e519	572	1,870	847	745	723	460
4	3,560	944	e607	e542	e594	e501	566	1,540	828	722	700	458
5	2,810	933	e612	e545	e610	e504	557	1,460	807	753	687	422
6	2,010	911	e641	e550	e608	e503	554	1,440	801	835	707	420
7	1,690	891	e619	e548	e618	e515	559	1,450	812	1,910	689	414
8	1,590	896	e646	e535	e615	e540	559	1,480	848	2,970	690	420
9	1,390	923	e659	e528	e601	e538	553	2,460	889	4,870	641	411
10	1,330	911	e664	e528	e591	e573	568	2,490	927	6,050	620	394
11	1,250	888	e673	e525	e582	524	557	2,520	1,090	4,720	617	410
12	1,210	871	e727	e528	e591	623	553	3,060	1,090	3,230	604	411
13	1,140	874	e716	e546	e585	1,360	566	3,120	972	2,620	589	467
14	1,080	844	e710	e550	e576	1,260	592	2,550	938	2,120	577	686
15	1,060	816	e718	e558	e569	1,020	590	2,410	932	1,780	573	897
16	1,040	842	e721	e548	e567	907	592	2,420	900	1,600	570	670
17	1,040	837	695	e549	e546	816	587	2,430	861	1,460	562	548
18	1,010	809	720	e556	e540	744	570	2,070	814	1,290	555	481
19	1,010	811	768	e557	e563	729	562	1,820	807	1,230	547	466
20	985	813	756	e575	e608	776	576	1,660	908	1,090	548	452
21	940	828	706	e555	e655	708	605	1,470	827	1,360	562	461
22	916	824	686	e548	e698	667	629	1,380	724	1,970	551	471
23	916	811	e547	e563	e708	645	619	1,230	712	1,360	528	470
24	922	793	e562	e564	e690	620	615	1,220	702	1,140	510	463
25	963	785	e581	e557	e671	601	588	1,190	804	1,050	497	457
26	1,000	773	e588	e567	e665	590	571	1,150	883	988	541	436
27	1,050	764	e572	e572	e679	590	586	1,080	1,200	941	526	430
28	1,010	752	e562	e575	e685	601	569	1,040	1,050	898	505	431
29	982	e764	e557	e581	---	605	552	970	1,090	837	505	438
30	990	e751	e561	e599	---	603	643	989	895	820	498	447
31	1,000	---	e574	e597	---	596	---	958	---	778	494	---
TOTAL	41,054	25,452	20,274	17,214	17,245	20,976	17,343	53,881	26,697	53,775	18,446	14,311
MEAN	1,324	848	654	555	616	677	578	1,738	890	1,735	595	477
MAX	3,560	944	768	599	708	1,360	643	3,120	1,200	6,050	768	897
MIN	910	751	547	525	540	501	552	874	702	722	494	394
AC-FT	81,430	50,480	40,210	34,140	34,210	41,610	34,400	106,900	52,950	106,700	36,590	28,390
CFSM	0.85	0.55	0.42	0.36	0.40	0.44	0.37	1.12	0.57	1.12	0.38	0.31
IN.	0.98	0.61	0.49	0.41	0.41	0.50	0.42	1.29	0.64	1.29	0.44	0.34

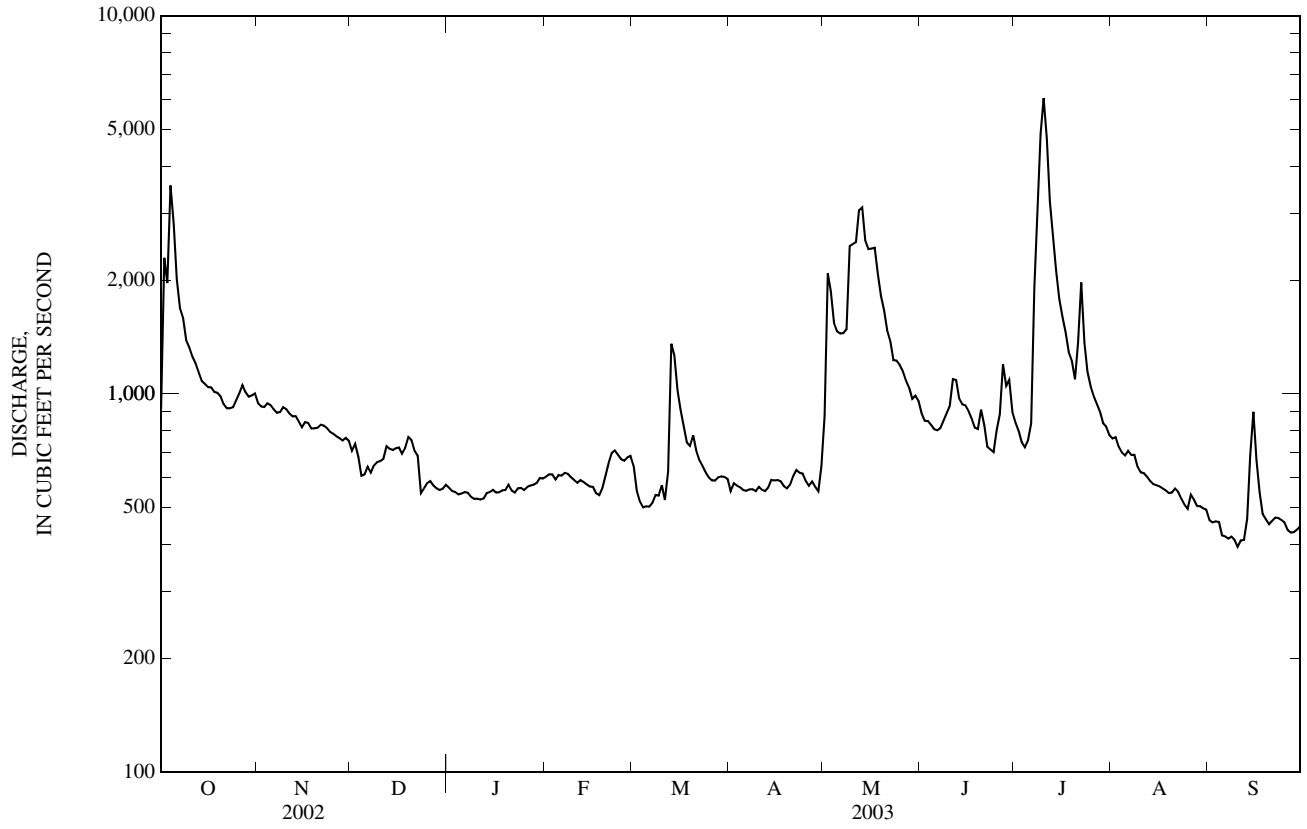
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2003, BY WATER YEAR (WY)

MEAN	743	788	653	678	1,098	1,833	1,380	1,271	1,541	1,086	843	879
MAX	2,486	4,983	2,397	2,851	4,161	4,798	4,843	4,267	6,670	8,835	3,340	3,074
(WY)	(1987)	(1962)	(1983)	(1960)	(1971)	(1993)	(1973)	(1974)	(1947)	(1993)	(1924)	(1981)
MIN	210	198	168	150	196	241	305	198	170	177	227	182
(WY)	(1957)	(1959)	(2001)	(1940)	(1936)	(1934)	(1934)	(1934)	(1934)	(1936)	(1958)	(1958)

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1914 - 2003	
ANNUAL TOTAL	558,477		326,668			
ANNUAL MEAN	1,530		895		1,065	
HIGHEST ANNUAL MEAN					2,874	1993
LOWEST ANNUAL MEAN					306	1958
HIGHEST DAILY MEAN	45,900	Jun 5	6,050	Jul 10	45,900	Jun 5, 2002
LOWEST DAILY MEAN	356	Feb 6	394	Sep 10	105	Feb 11, 1936
ANNUAL SEVEN-DAY MINIMUM	403	Feb 2	411	Sep 6	105	Feb 11, 1936
MAXIMUM PEAK FLOW			6,790	Jul 10	48,000	Jun 27, 1944
MAXIMUM PEAK STAGE			19.54	Jul 10	24.70	Jun 27, 1944a
ANNUAL RUNOFF (AC-FT)	1,108,000		647,900		771,500	
ANNUAL RUNOFF (CFSM)	0.99		0.58		0.69	
ANNUAL RUNOFF (INCHES)	13.38		7.82		9.32	
10 PERCENT EXCEEDS	2,150		1,460		2,000	
50 PERCENT EXCEEDS	974		690		660	
90 PERCENT EXCEEDS	595		517		300	

a Datum in use prior to Oct. 1, 1972.
e Estimated



05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA—Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--April 1978 to December 1981; October 1994 to September 30, 1997; April 13, 2000 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1978 to December 1981; October 1994 to September 30, 1997; April 13, 2000 to current year.
WATER TEMPERATURES: April 1978 to December 1981; October 1994 to September 30, 1997; April 13, 2000 to current year.
SUSPENDED-SEDIMENT DISCHARGE: April 1978 to December 1981; October 1994 to September 30, 1997; April 13, 2000 to current year.

REMARKS.--During periods of ice effect, sediment samples are collected in open water channel. Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 625 microsiemens Mar. 2, 1995; minimum daily, 160 microsiemens June 16, 1981.
WATER TEMPERATURES: Maximum daily, 30.5×C July 12, 1995; minimum daily, 0.0×C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 14,700 mg/L June 13, 1981; minimum daily mean, 12 mg/L Feb. 7, 8, 1981.
SEDIMENT LOADS: Maximum daily, 361,000 tons Aug. 31, 1981; minimum daily, 9.4 tons Feb. 8, 1981.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 613 microsiemens Jan. 3; minimum daily, 372 microsiemens Aug. 12.
WATER TEMPERATURES: Maximum daily, 29.4×C Aug. 6; minimum daily, 0.5×C Dec. 3-6, 27.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,820 mg/L July 10; minimum daily mean, 18 mg/L Dec. 23.
SEDIMENT LOADS: Maximum daily, 29,800 tons July 10; minimum daily, 27 tons Dec. 23.

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	522	451	---	---	---	---	---	525	---	---	---	---
2	---	---	439	419	---	---	445	477	---	---	---	404
3	---	---	447	613	---	---	462	---	465	---	---	501
4	429	434	427	---	---	---	---	---	507	---	---	---
5	---	475	433	---	---	---	---	523	483	---	397	---
6	---	---	429	---	---	---	---	528	---	---	496	---
7	574	432	---	---	---	---	---	539	---	---	---	---
8	586	---	---	492	---	---	---	---	---	---	---	---
9	492	---	492	---	---	---	413	516	535	---	---	---
10	497	---	553	---	---	---	458	---	500	---	---	---
11	---	---	501	---	---	445	445	---	534	---	---	---
12	---	---	575	---	---	---	---	521	---	---	372	---
13	---	541	---	---	---	---	---	439	510	---	401	---
14	---	447	---	---	---	---	---	---	---	---	---	---
15	518	428	---	---	---	---	498	---	---	---	---	---
16	461	---	600	---	---	---	509	---	510	---	---	---
17	480	---	444	---	---	504	522	---	489	---	---	---
18	---	500	439	---	---	---	474	---	---	---	384	---
19	---	---	563	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	451	496	---	---	---	---	---	---	---	---	---	---
22	456	---	---	---	---	---	---	578	---	379	---	---
23	---	---	599	---	---	---	487	521	---	382	---	---
24	---	---	---	---	---	454	---	---	---	---	---	---
25	539	425	---	---	---	462	---	---	---	---	---	---
26	---	517	539	---	---	447	---	---	---	---	---	---
27	---	422	602	---	---	---	---	569	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	554	---	---	---	---	---	---	---	---	---	394	---
30	440	---	465	---	---	---	554	540	---	---	---	---
31	---	---	546	---	---	462	---	---	---	---	---	---

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	6.0	---	---	---	---	---	---	---	---	---	---
2	---	---	1.0	---	---	---	---	---	---	---	---	---
3	---	---	0.5	2.0	---	---	---	---	14.5	---	---	21.0
4	16.5	6.0	0.5	---	---	---	---	---	---	---	---	---
5	---	4.5	0.5	---	---	---	---	---	---	---	24.0	---
6	---	---	0.5	---	---	---	---	---	---	---	29.4	---
7	16.0	7.5	---	---	---	---	---	---	---	---	---	---
8	14.5	---	---	2.0	---	---	---	---	---	---	---	---
9	15.5	---	1.0	---	---	---	---	---	---	---	---	---
10	16.0	---	2.5	---	---	---	---	---	---	---	---	---
11	---	---	2.0	---	---	---	---	---	---	---	---	---
12	---	---	1.5	---	---	---	---	---	---	---	24.5	---
13	---	7.0	---	---	---	---	---	---	---	---	24.5	---
14	---	6.5	---	---	---	---	---	---	---	---	---	---
15	8.5	6.5	---	---	---	---	---	---	---	---	---	---
16	10.5	---	1.5	---	---	---	---	---	---	---	---	---
17	8.5	---	---	---	---	---	---	---	---	---	---	---
18	---	4.0	4.0	---	---	---	---	---	---	---	24.5	---
19	---	---	4.0	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	10.5	4.5	---	---	---	---	---	---	---	---	---	---
22	9.5	---	---	---	---	---	---	---	---	24.0	---	---
23	---	---	1.0	---	---	---	---	---	---	24.0	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	7.5	1.5	---	---	---	---	---	---	---	---	---	---
26	---	1.5	1.5	---	---	---	---	---	---	---	---	---
27	---	1.0	0.5	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	7.5	---	---	---	---	---	---	---	---	---	26.5	---
30	9.0	---	3.5	---	---	---	13.0	---	---	---	---	---
31	---	---	2.5	---	---	---	---	---	---	---	---	---

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

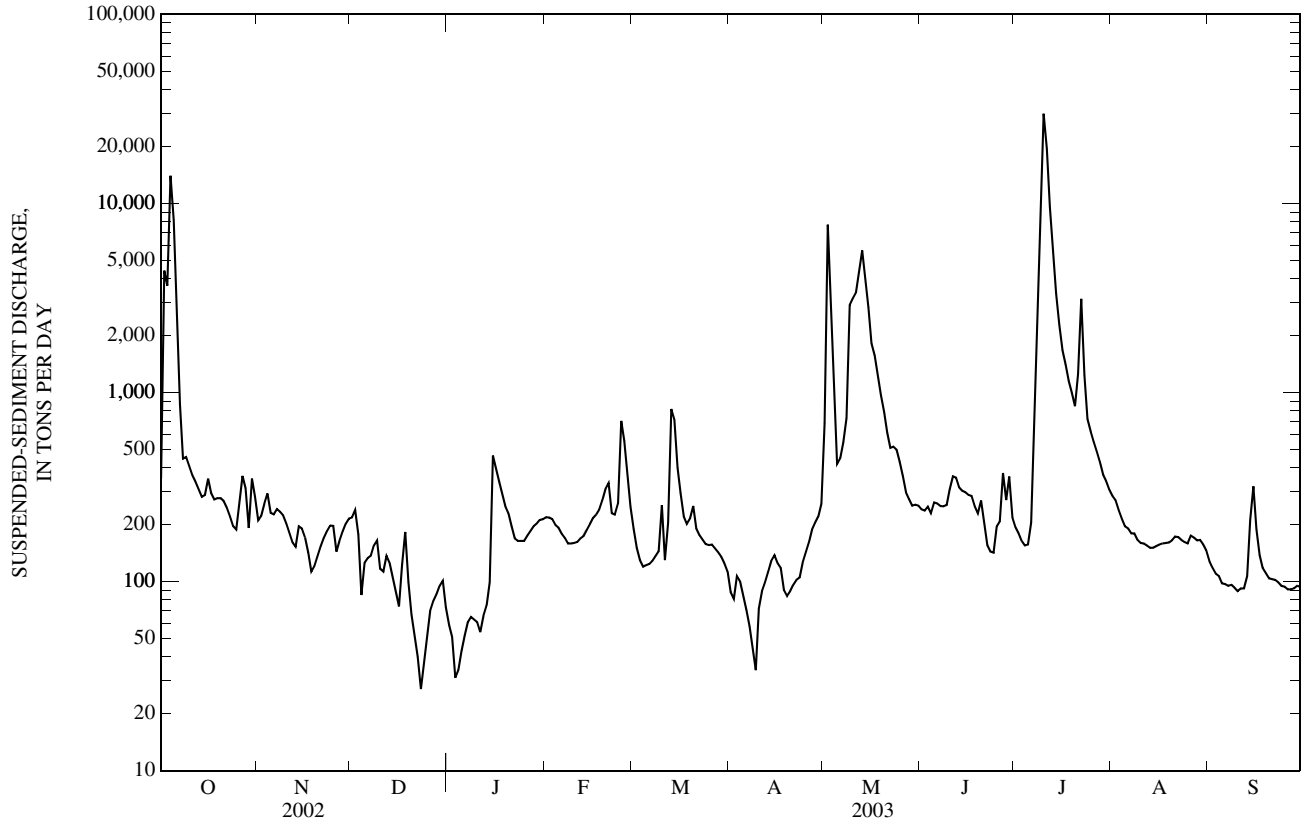
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	143	351	83	211	114	218	39	59	134	219	109	189
2	663	4,410	89	223	120	239	34	51	132	218	101	151
3	692	3,670	104	259	96	177	21	31	129	214	93	130
4	1,320	14,000	115	292	52	85	23	34	124	199	89	120
5	1,050	8,180	92	231	76	126	29	43	117	193	90	122
6	558	3,050	92	227	77	133	35	52	109	179	91	124
7	186	869	101	242	82	137	41	61	102	170	93	129
8	104	447	97	234	89	155	45	65	96	159	94	137
9	122	456	90	224	93	165	44	63	98	159	100	145
10	113	408	83	203	65	117	43	61	100	160	164	254
11	108	365	76	181	62	113	38	54	103	162	92	130
12	104	338	68	161	70	137	46	66	106	169	120	205
13	100	308	65	153	65	126	51	75	110	174	222	817
14	96	281	86	196	55	105	67	99	120	187	206	722
15	100	287	87	191	46	89	308	464	131	201	145	400
16	124	350	75	171	38	74	269	398	142	217	120	293
17	105	294	63	142	65	122	228	338	153	226	100	221
18	100	272	52	113	94	183	195	293	165	241	100	202
19	102	276	55	121	48	99	166	250	177	269	109	216
20	104	276	62	136	33	67	148	230	189	310	119	251
21	105	267	69	154	27	52	131	196	188	332	100	191
22	99	246	77	170	22	40	114	169	122	230	98	176
23	89	221	84	185	18	27	108	164	118	226	96	167
24	79	197	92	198	25	38	108	164	139	259	94	158
25	73	189	93	197	34	53	109	164	391	708	96	156
26	97	262	69	144	44	70	114	175	309	555	99	157
27	127	362	80	164	51	79	120	185	202	370	94	150
28	114	312	91	184	57	86	126	196	134	248	88	143
29	72	192	98	202	63	95	129	202	---	---	82	135
30	131	350	106	215	67	101	131	212	---	---	76	125
31	104	281	---	---	47	73	133	214	---	---	70	113
TOTAL	---	41,767	---	5,724	---	3,381	---	4,828	---	6,954	---	6,629

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	59	88	274	687	101	241	86	194	138	283	103	128
2	52	81	1,340	7,720	103	237	84	180	130	269	96	118
3	69	107	531	2,690	109	249	82	164	122	238	89	110
4	65	100	279	1,160	103	230	80	155	114	215	87	107
5	56	85	106	419	120	262	77	157	106	196	86	98
6	47	71	116	449	120	259	88	205	100	191	86	97
7	38	58	139	545	114	251	263	1,390	97	180	85	95
8	29	44	183	732	109	250	428	3,930	96	180	85	96
9	23	34	428	2,900	106	254	888	12,500	96	166	84	93
10	47	72	467	3,140	123	308	1,820	29,800	96	160	84	89
11	59	89	496	3,380	122	360	1,510	19,500	95	159	83	92
12	66	99	524	4,370	121	354	1,090	9,580	95	155	83	92
13	74	113	661	5,640	120	315	802	5,730	95	151	84	107
14	81	129	586	4,050	119	302	582	3,340	97	151	113	212
15	87	138	434	2,810	118	297	472	2,280	100	154	131	319
16	78	125	278	1,820	118	287	387	1,670	102	157	104	189
17	74	118	239	1,570	122	284	357	1,410	104	159	93	138
18	59	90	218	1,220	114	250	330	1,150	107	160	91	118
19	55	84	197	969	105	230	304	1,000	109	161	88	111
20	57	89	176	790	109	268	287	846	112	165	86	104
21	59	96	155	616	89	200	339	1,250	114	173	83	103
22	60	102	137	509	80	156	582	3,130	116	172	81	102
23	63	105	156	517	75	144	330	1,230	117	166	78	99
24	76	126	151	498	75	142	235	725	118	162	76	95
25	90	143	134	431	88	196	220	623	118	159	76	94
26	105	161	117	362	87	208	206	549	119	175	77	91
27	119	189	101	296	114	375	191	486	120	171	78	91
28	134	205	97	273	95	270	177	429	121	165	79	92
29	148	221	96	252	122	359	163	368	122	166	80	95
30	149	258	95	255	90	218	154	340	117	157	78	94
31	---	---	98	252	---	---	146	306	110	146	---	---
TOTAL	---	3,420	---	51,322	---	7,756	---	104,617	---	5,462	---	3,469
YEAR	245,329											

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

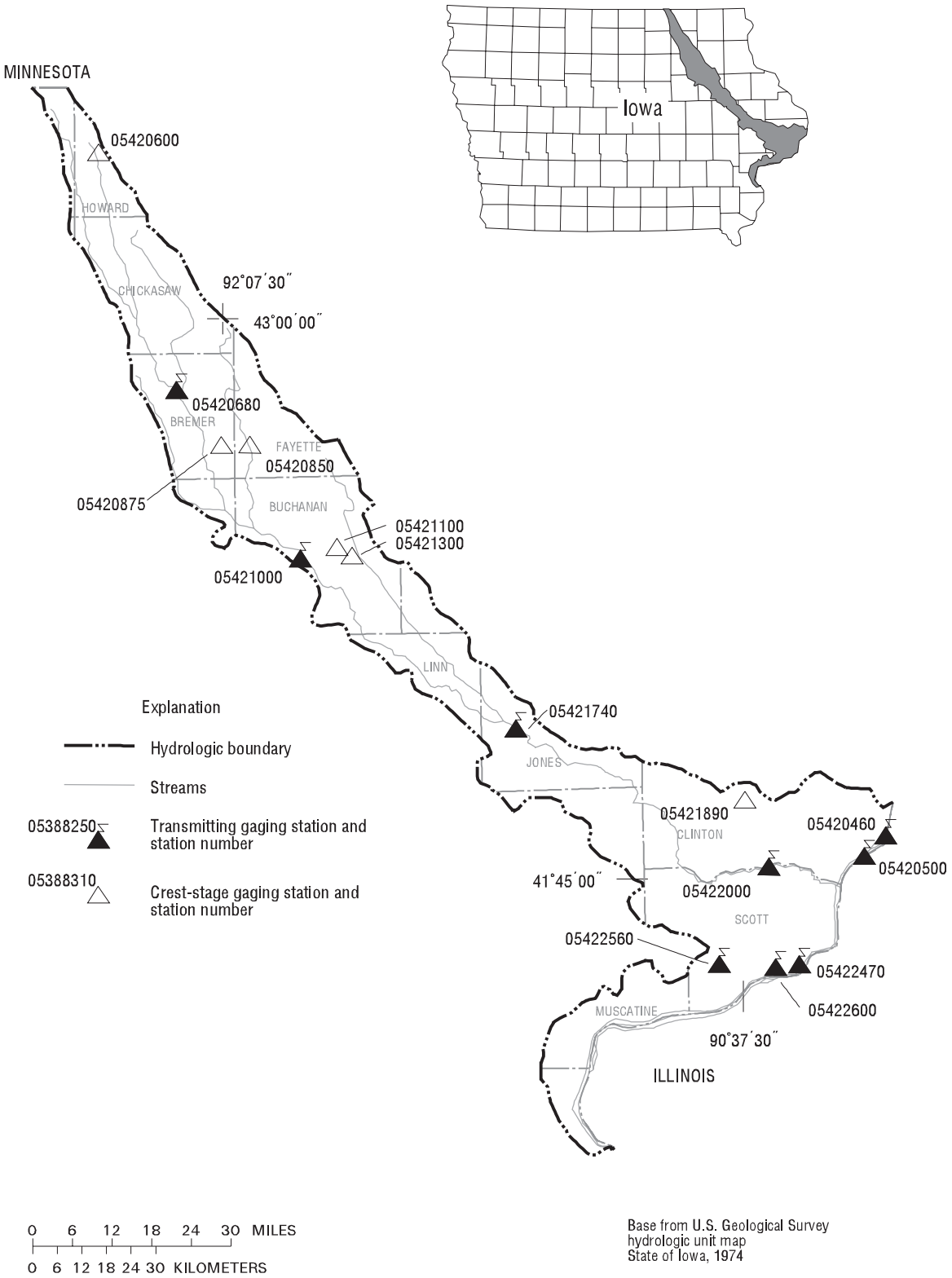


Figure 8. Locations of active continuous-record and crest-stage gaging stations in the Mississippi River, Wapsipinicon River, and Crow Creek drainage basins.

Gaging Stations

05420460 Beaver Slough at 3rd Street at Clinton, IA 88
05420500 Mississippi River at Clinton, IA 90
05420680 Wapsipinicon River nr Tripoli, IA 98
05421000 Wapsipinicon River at Independence, IA 106
05421740 Wapsipinicon River at Anamosa, IA 108
05422000 Wapsipinicon River near De Witt, IA 110
05422470 Crow Creek at Bettendorf, IA 112
05422560 Duck Creek at 110th Ave at Davenport, IA 114
05422600 Duck Creek at Duck Creek Golf Course, Davenport, IA 116

Crest Stage Gaging Stations

05420600 Little Wapsipinicon River Tributary near Riceville, IA 457
05420850 Little Wapsipinicon River near Oran, IA 457
05420875 Buck Creek near Oran, IA 457
05421100 Pine Creek Tributary near Winthrop, IA 458
05421300 Wapsipinicon River Tributary at Winthrop, IA 458
05421890 Silver Creek at Welton, IA 458

05420460 BEAVER SLOUGH AT THIRD STREET CLINTON, IA

LOCATION.--Lat 41°49'38", long 90°11'25", in SW¼ SE¼ NW¼ sec.18, T.81 N., R.7 E., Clinton County, Hydrologic Unit 07080101, at river end of 3rd street, at downstream end of ADM repair dock, 10.3 miles upstream from Wapsipinicon River, 4.8 miles upstream from Camanche gage, 5.9 miles downstream from Lock and Dam 13, and at mile 516.6 upstream from Ohio River.

DRAINAGE AREA.--85,600 mi^2, approximately, at Fulton-Lyons Bridge at Clinton.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11,200	14,300	8,980	8,260	e5,950	6,380	13,800	32,200	22,400	14,500	7,080	3,440
2	12,500	14,300	7,970	8,450	e6,050	6,100	14,200	32,000	21,100	15,100	7,060	4,420
3	13,000	14,300	7,460	8,400	e6,100	6,000	13,800	30,200	19,900	15,600	6,710	4,080
4	13,100	14,400	6,310	8,520	e6,120	5,180	13,700	26,500	18,800	16,200	6,270	3,680
5	13,800	14,300	6,050	8,350	e6,020	5,400	13,600	26,200	16,500	17,100	6,450	3,720
6	14,300	13,700	5,930	8,230	e5,930	5,640	12,300	24,800	15,000	17,800	6,750	3,640
7	14,400	12,300	6,020	8,470	e6,260	5,710	11,800	22,400	14,800	18,900	6,530	3,280
8	14,300	11,300	6,190	8,180	e6,380	5,140	11,800	19,700	13,600	19,800	6,530	2,820
9	14,600	11,200	6,860	7,990	e6,220	5,810	11,800	18,900	12,700	20,600	6,550	2,840
10	16,800	11,500	7,060	7,700	e6,290	6,170	10,800	18,700	13,200	21,600	6,680	3,020
11	18,600	11,800	7,080	6,140	e6,380	5,710	10,100	19,900	13,400	22,400	6,510	3,440
12	20,300	12,000	7,440	e5,520	e6,380	5,160	9,860	22,800	13,300	20,600	6,240	3,910
13	21,900	11,900	8,210	e5,110	e6,310	4,510	10,000	22,800	13,300	19,200	5,750	4,560
14	22,600	11,600	10,000	e5,710	e6,220	6,240	10,200	24,200	13,400	17,900	5,710	7,180
15	24,200	11,400	10,200	e6,720	e6,120	7,420	10,200	25,000	14,400	16,700	5,140	6,510
16	24,700	11,600	10,300	e6,140	e6,070	7,580	9,670	26,500	14,800	16,200	4,720	5,400
17	25,000	11,400	9,720	e5,860	e5,950	8,780	9,650	27,500	15,500	14,900	4,540	4,910
18	25,000	10,800	9,500	e5,640	e5,830	11,200	10,800	29,500	16,000	14,100	4,720	4,050
19	24,500	10,500	9,360	e5,760	e5,760	13,900	13,000	33,500	15,400	14,400	4,640	3,610
20	23,500	10,200	10,400	e5,930	e5,950	14,000	15,200	35,000	14,500	14,400	4,440	3,630
21	21,800	10,300	10,400	e6,050	e6,000	14,400	17,400	37,200	13,700	13,900	4,260	4,550
22	21,200	10,300	9,820	e6,580	6,220	14,700	20,700	37,700	12,600	13,800	4,680	5,190
23	19,600	10,200	9,360	e6,190	6,480	14,900	22,500	37,000	11,200	13,700	5,280	5,480
24	17,600	9,360	7,680	e6,500	6,980	15,200	24,000	36,000	9,500	12,800	5,160	5,350
25	16,100	9,580	6,600	e6,020	7,780	14,800	25,500	34,600	8,660	10,900	5,100	5,300
26	15,600	8,980	6,050	e6,070	7,700	14,300	27,800	32,400	9,700	10,100	4,900	4,820
27	15,400	9,910	6,220	e6,170	7,680	14,300	29,000	29,500	10,500	9,870	4,120	4,600
28	15,300	9,980	6,670	e6,340	7,200	14,400	30,800	28,100	10,300	10,200	3,920	4,380
29	15,100	9,980	7,080	e6,530	---	14,800	31,500	26,400	10,900	9,590	3,460	3,430
30	14,400	9,910	7,920	e6,310	---	14,000	32,200	24,700	12,800	8,950	3,220	3,060
31	14,500	---	8,350	e6,020	---	13,600	---	23,000	---	8,190	3,380	---
TOTAL	554,900	343,300	247,190	209,860	178,330	301,430	497,680	864,900	421,860	470,000	166,500	128,300
MEAN	17,900	11,440	7,974	6,770	6,369	9,724	16,590	27,900	14,060	15,160	5,371	4,277
MAX	25,000	14,400	10,400	8,520	7,780	15,200	32,200	37,700	22,400	22,400	7,080	7,180
MIN	11,200	8,980	5,930	5,110	5,760	4,510	9,650	18,700	8,660	8,190	3,220	2,820
AC-FT	1,101,000	680,900	490,300	416,300	353,700	597,900	987,100	1,716,000	836,800	932,200	330,300	254,500
CFSM	0.21	0.13	0.09	0.08	0.07	0.11	0.19	0.33	0.16	0.18	0.06	0.05
IN.	0.24	0.15	0.11	0.09	0.08	0.13	0.22	0.38	0.18	0.20	0.07	0.06

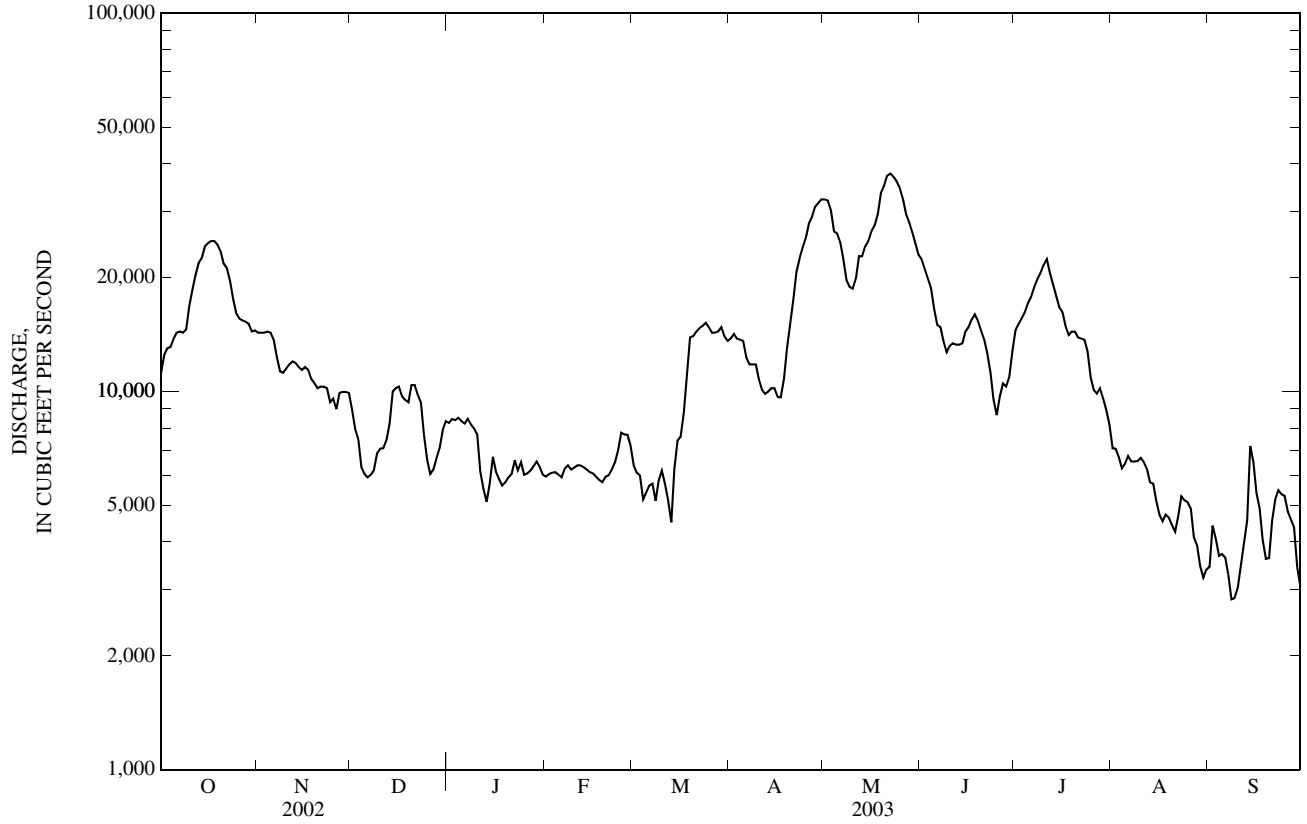
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2003, BY WATER YEAR (WY)

MEAN	11,090	11,960	9,493	8,846	9,886	14,310	27,580	26,240	20,320	19,390	13,100	10,850
MAX	17,900	18,320	11,680	12,780	14,510	19,900	43,980	42,580	35,240	49,690	28,330	21,640
(WY)	(2003)	(1996)	(1997)	(1995)	(1994)	(1995)	(1997)	(2001)	(1993)	(1993)	(1993)	(1993)
MIN	5,760	7,609	6,070	6,770	6,369	9,474	10,350	11,590	13,010	11,950	5,371	4,277
(WY)	(2001)	(2002)	(2001)	(2003)	(2003)	(2001)	(2000)	(2000)	(1997)	(1995)	(2003)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1993 - 2003	
ANNUAL TOTAL	5,258,640		4,384,250			
ANNUAL MEAN	14,410		12,010		15,270	
HIGHEST ANNUAL MEAN					23,060	1993
LOWEST ANNUAL MEAN					10,720	2000
HIGHEST DAILY MEAN	38,200	Apr 25	37,700	May 22	61,600	Apr 23, 2001
LOWEST DAILY MEAN	5,280	Jan 22	2,820	Sep 8	2,820	Sep 8, 2003
ANNUAL SEVEN-DAY MINIMUM	5,820	Jan 18	3,250	Sep 5	3,250	Sep 5, 2003
MAXIMUM PEAK FLOW			37,900	May 23		
MAXIMUM PEAK STAGE			19.90	May 23		
ANNUAL RUNOFF (AC-FT)	10,430,000		8,696,000		11,060,000	
ANNUAL RUNOFF (CFSM)	0.17		0.14		0.18	
ANNUAL RUNOFF (INCHES)	2.29		1.91		2.42	
10 PERCENT EXCEEDS	23,500		23,200		27,400	
50 PERCENT EXCEEDS	13,500		10,100		12,300	
90 PERCENT EXCEEDS	6,760		4,910		6,830	

05420460 BEAVER SLOUGH AT THIRD STREET CLINTON, IA—Continued

e Estimated



05420500 MISSISSIPPI RIVER AT CLINTON, IA

(National stream-quality accounting network station)

LOCATION.--Lat 41°46'50", long 90°15'07", in NW$^1/_4$ sec.34, T.81 N., R.6 E., Clinton County, Hydrologic Unit 07080101, on right bank at end of Eighth Avenue in Camanche, 5.0 mi upstream from Wapsipinicon River, 6.4 mi downstream from Clinton, 10.6 mi downstream from Lock and Dam 13, and at mile 511.8 upstream from Ohio River.

DRAINAGE AREA.--85,600 mi^2, approximately, at Fulton-Lyons Bridge at Clinton.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June to August 1873 (fragmentary), October 1873 to current year (October 1932 to September 1939, published as "at Le Claire")(June 1873 to December 1932 published in the Iowa State Planning Board report "Stream-flow records of Iowa, 1873-1932").

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft above NGVD of 1929. June 6, 1969 to Sept. 16, 1988, water-stage recorder at site 400 ft upstream at same datum. Auxiliary water-stage recorder at Lock and Dam 13 since Oct. 1, 1958. See WSP 1728 for history of changes prior to Oct. 1, 1955.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1828, that of Apr. 28, 1965.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46,800	59,500	37,400	34,400	e24,800	26,600	57,600	129,000	93,300	60,300	32,200	17,200
2	52,100	59,500	33,200	35,200	e25,200	25,400	59,100	128,000	88,100	63,100	32,100	22,100
3	54,200	59,700	31,100	35,000	e25,400	25,000	57,500	121,000	83,000	64,900	30,500	20,400
4	54,700	60,000	26,300	35,500	e25,500	21,600	57,000	106,000	78,200	67,500	28,500	18,400
5	57,500	59,500	25,200	34,800	e25,100	22,500	56,800	105,000	68,700	71,100	29,300	18,600
6	59,700	56,900	24,700	34,300	e24,700	23,500	51,300	99,100	62,500	74,300	30,700	18,200
7	60,100	51,300	25,100	35,300	e26,100	23,800	49,100	89,400	61,600	78,800	31,100	16,400
8	59,700	47,100	25,800	34,100	e26,600	21,400	49,300	78,800	56,800	82,600	31,100	14,100
9	60,900	46,500	28,600	33,300	e25,900	24,200	49,100	75,600	53,100	86,000	31,200	14,200
10	70,100	47,800	29,400	32,100	e26,200	25,700	45,000	74,900	54,800	90,100	31,800	14,400
11	77,700	49,000	29,500	25,600	e26,600	23,800	42,200	79,500	55,800	93,400	31,000	16,400
12	84,400	50,000	31,000	e23,000	e26,600	21,500	41,100	91,000	55,400	85,700	29,700	18,600
13	91,100	49,400	34,200	e21,300	e26,300	18,800	41,700	91,400	55,300	80,200	27,400	21,700
14	94,200	48,300	41,700	e23,800	e25,900	26,000	42,500	96,600	55,900	74,600	27,200	34,200
15	101,000	47,700	42,300	e28,000	e25,500	30,900	42,700	99,900	60,000	69,400	24,500	31,000
16	103,000	48,300	42,800	e25,600	e25,300	31,600	40,300	106,000	61,600	67,600	23,600	25,700
17	104,000	47,600	40,500	e24,400	e24,800	36,600	40,200	110,000	64,500	62,100	22,700	23,400
18	104,000	45,100	39,600	e23,500	e24,300	46,800	43,300	118,000	66,500	58,800	23,600	19,300
19	102,000	43,800	39,000	e24,000	e24,000	58,000	52,200	134,000	64,200	60,100	23,200	17,200
20	97,900	42,600	43,500	e24,700	e24,800	58,200	60,600	146,000	60,600	59,800	22,200	17,300
21	91,000	42,900	43,400	e25,200	e25,000	59,900	69,700	155,000	57,000	57,800	21,300	20,700
22	88,400	42,900	40,900	e27,400	25,900	61,400	82,700	157,000	52,500	57,600	23,400	23,600
23	81,800	42,300	39,000	e25,800	27,000	62,000	90,000	154,000	46,500	57,100	26,400	24,900
24	73,400	39,000	32,000	e27,100	29,100	63,400	96,200	150,000	39,600	53,500	25,800	24,300
25	66,900	39,900	27,500	e25,100	32,400	61,800	102,000	144,000	36,100	47,200	25,500	24,100
26	65,100	37,400	25,200	e25,300	32,100	59,400	111,000	135,000	40,400	44,000	24,500	21,900
27	64,200	41,300	25,900	e25,700	32,000	59,600	116,000	123,000	43,900	42,900	20,600	20,900
28	63,700	41,600	27,800	e26,400	30,000	60,200	123,000	117,000	43,100	44,200	19,600	19,900
29	62,900	41,600	29,500	e27,200	---	61,500	126,000	110,000	45,500	41,700	17,300	15,600
30	60,200	41,300	33,000	e26,300	---	58,400	129,000	103,000	53,300	38,900	16,100	13,900
31	60,300	---	34,800	e25,100	---	56,600	---	95,700	---	35,600	16,900	---
TOTAL	2,313,000	1,429,800	1,029,900	874,500	743,100	1,256,100	2,024,200	3,522,900	1,757,800	1,970,900	801,000	608,600
MEAN	74,610	47,660	33,220	28,210	26,540	40,520	67,470	113,600	58,590	63,580	25,840	20,290
MAX	104,000	60,000	43,500	35,500	32,400	63,400	129,000	157,000	93,300	93,400	32,200	34,200
MIN	46,800	37,400	24,700	21,300	24,000	18,800	40,200	74,900	36,100	35,600	16,100	13,900
AC-FT	4,588,000	2,836,000	2,043,000	1,735,000	1,474,000	2,491,000	4,015,000	6,988,000	3,487,000	3,909,000	1,589,000	1,207,000
CFSM	0.87	0.56	0.39	0.33	0.31	0.47	0.79	1.33	0.68	0.74	0.30	0.24
IN.	1.01	0.62	0.45	0.38	0.32	0.55	0.88	1.53	0.76	0.86	0.35	0.26

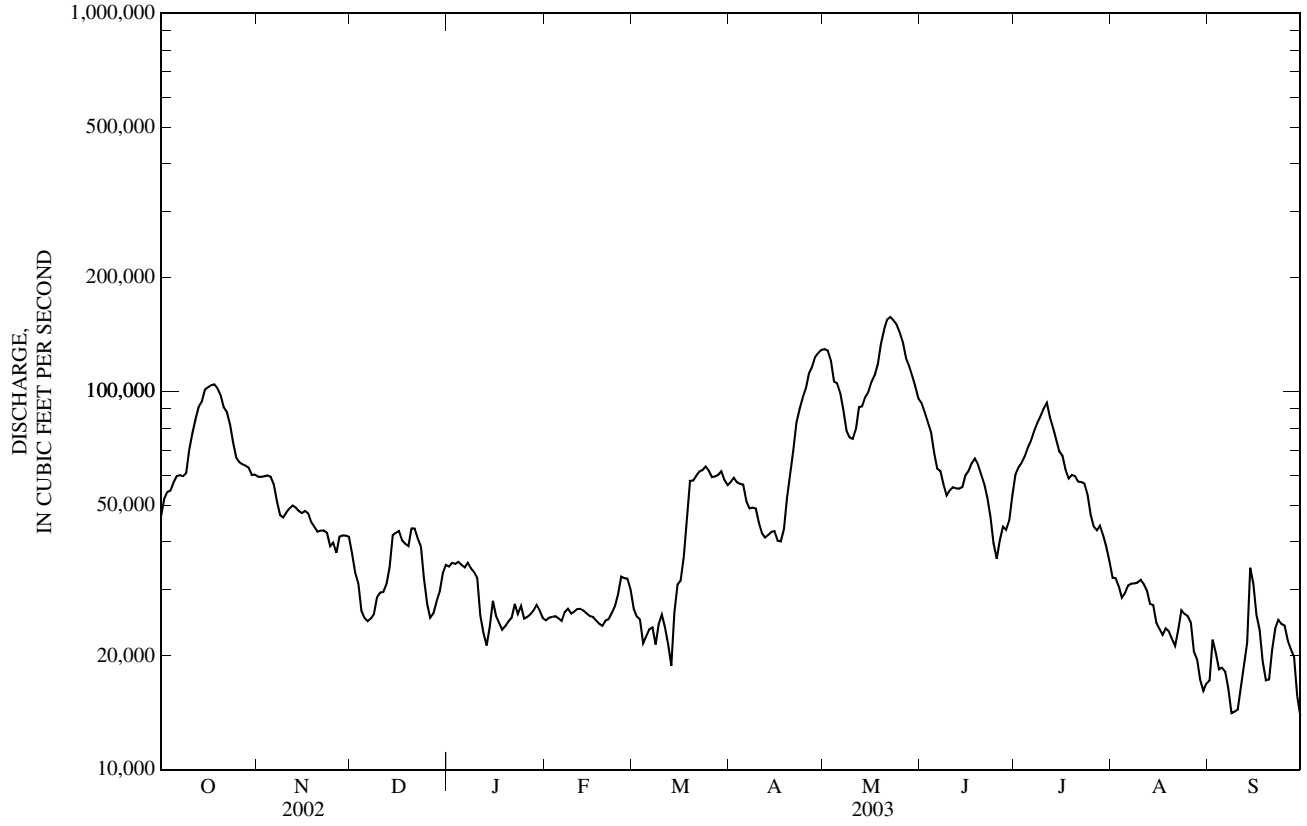
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1874 - 2003, BY WATER YEAR (WY)

MEAN	40,880	39,300	28,020	25,860	28,240	50,470	89,910	82,700	69,310	56,270	37,880	38,020
MAX	203,600	146,800	73,590	54,100	65,680	127,500	175,900	212,400	182,100	198,900	113,400	92,380
(WY)	(1882)	(1882)	(1882)	(1973)	(1966)	(1973)	(1997)	(1888)	(1892)	(1993)	(1993)	(1938)
MIN	13,490	13,760	11,120	11,390	14,000	17,600	26,040	23,190	15,420	14,690	12,460	13,870
(WY)	(1934)	(1934)	(1934)	(1890)	(1893)	(1934)	(1931)	(1977)	(1988)	(1988)	(1936)	(1933)

05420500 MISSISSIPPI RIVER AT CLINTON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1874 - 2003	
ANNUAL TOTAL	22,567,800		18,331,800			
ANNUAL MEAN	61,830		50,220		48,950	
HIGHEST ANNUAL MEAN					94,690	1882
LOWEST ANNUAL MEAN					18,870	1934
HIGHEST DAILY MEAN	166,000	Apr 25	157,000	May 22	307,000	Apr 28, 1965
LOWEST DAILY MEAN	23,000	Jan 22	13,900	Sep 30	6,500	Dec 25, 1933
ANNUAL SEVEN-DAY MINIMUM	25,300	Jan 18	16,000	Sep 5	7,430	Dec 24, 1933
MAXIMUM PEAK FLOW			162,000	May 22		
MAXIMUM PEAK STAGE			17.04	May 23	24.65	Apr 28, 1965
ANNUAL RUNOFF (AC-FT)	44,760,000		36,360,000		35,460,000	
ANNUAL RUNOFF (CFSM)	0.72		0.59		0.57	
ANNUAL RUNOFF (INCHES)	9.81		7.97		7.77	
10 PERCENT EXCEEDS	102,000		95,900		95,200	
50 PERCENT EXCEEDS	56,700		42,300		37,700	
90 PERCENT EXCEEDS	29,200		22,900		19,000	

e Estimated



05420500 MISSISSIPPI RIVER AT CLINTON, IA—Continued
(National stream-quality accounting network station)

WATER QUALITY RECORDS

PERIOD OF RECORD.--October 1974 to September 1987, October 1994 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, wat unf lab, Hach 2100AN NTU (99872)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conductance, wat unf lab, uS/cm 25 degC (90095)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT													
17...	1005	102,000	40	743	10.4	94	7.5	8.1	260	265	6.5	10.9	110
DEC													
03...	1130	31,100	20	762	16.9	116	7.8	8.0	359	365	7.0	0.0	180
FEB													
20...	0945	29,400	6.1	755	21.7	147	8.5	8.2	433	433	5.7	0.1	200
MAR													
20...	1015	57,400	15	743	17.2	122	8.6	8.4	380	380	8.0	0.9	180
APR													
17...	1015	40,000	43	744	13.3	124	9.0	8.8	339	341	11.1	11.2	140
30...	1030	129,000	47	714	10.5	109	8.4	7.6	248	253	12.3	14.1	110
MAY													
19...	1015	125,000	44	746	10.2	109	8.2	7.9	304	306	22.0	17.3	130
23...	1040	158,000	33	751	8.4	94	7.8	8.0	255	261	20.0	17.4	110
JUN													
11...	0950	59,500	23	741	8.9	102	8.6	E7.9	389	384	21.0	20.7	190
30...	1100	53,300	22	757	5.7	69	8.2	8.1	385	403	--	24.5	180
JUL													
24...	1010	52,700	15	749	8.0	99	8.2	8.0	358	369	26.0	25.0	160
AUG													
19...	1035	23,600	15	751	10.3	132	8.8	8.8	336	353	29.0	27.4	170
SEP													
08...	1115	14,600	18	752	10.5	128	8.8	8.5	363	374	--	24.6	170

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)
OCT													
17...	28.0	10.8	2.48	0.3	7.67	E111	97	117	0.0	10.1	<0.2	10.6	12.0
DEC													
03...	43.1	16.9	2.17	0.3	9.12	154	138	166	0.0	14.5	<0.2	9.13	18.6
FEB													
20...	47.4	19.7	2.16	0.4	12.5	E215	177	211	2	17.6	0.15	9.24	23.7
MAR													
20...	41.7	17.2	2.98	0.4	12.6	158	155	171	9	18.5	0.14	7.08	19.5
APR													
17...	33.7	14.7	3.59	0.5	12.4	132	131	124	18	21.1	0.10	<0.13	19.7
30...	26.0	10.4	3.62	0.4	9.74	89	85	104	--	14.0	<0.17	3.83	16.5
MAY													
19...	31.8	12.0	3.13	0.3	7.08	105	109	133	--	12.9	<0.2	3.53	21.9
23...	26.8	10.1	2.91	0.3	6.81	89	89	108	0.0	11.4	<0.2	3.87	18.9
JUN													
11...	46.4	18.3	2.52	0.3	9.33	201	148	162	9	14.9	<0.2	0.97	32.5
30...	42.2	18.1	2.58	0.3	9.97	148	138	169	--	16.6	<0.2	2.92	31.0
JUL													
24...	39.2	15.0	2.21	0.3	8.15	141	145	177	--	14.1	<0.2	10.6	24.3
AUG													
19...	39.5	18.2	2.12	0.3	8.79	149	148	145	17	14.9	<0.2	4.04	22.1
SEP													
08...	38.1	18.9	2.21	0.3	9.01	159	152	163	11	15.4	<0.2	4.00	20.4

05420500 MISSISSIPPI RIVER AT CLINTON, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, fltrd, mg/L (00666)	Phos-phorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Alum-inum, water, fltrd, ug/L (01106)
OCT													
17...	0.24	177	0.54	0.97	<0.04	0.99	0.010	0.070	0.085	0.200	2.4	9.8	--
DEC													
03...	0.31	232	0.42	0.83	<0.04	1.59	E.007	E.006	0.016	0.104	2.4	7.4	--
FEB													
20...	0.37	268	0.36	0.78	<0.04	1.83	0.017	<0.007	0.009	0.058	2.4	5.2	--
MAR													
20...	0.32	236	0.33	1.1	<0.04	1.22	0.017	<0.007	0.013	0.151	3.6	5.9	--
APR													
17...	0.29	212	0.46	1.4	<0.04	0.69	0.018	<0.007	0.017	0.190	6.1	33.6	--
30...	0.22	159	0.56	1.6	<0.04	0.53	0.026	E.004	0.030	0.22	5.4	10.0	2
MAY													
19...	0.26	192	0.62	1.3	<0.04	1.62	0.046	0.017	0.033	0.191	3.3	21.5	--
23...	0.22	159	0.62	1.2	<0.04	0.95	0.102	0.022	0.041	0.169	--	15.0	--
JUN													
11...	0.33	241	0.55	1.3	<0.04	1.59	0.024	<0.007	0.021	0.147	3.8	7.4	--
30...	0.32	236	0.67	1.0	<0.04	1.07	0.035	0.070	0.086	0.155	1.9	10.9	--
JUL													
24...	0.31	229	0.63	0.91	E.02	1.25	0.019	0.083	0.099	0.167	2.1	9.1	--
AUG													
19...	0.29	214	0.55	1.2	<0.04	<0.06	<0.008	0.043	0.059	0.175	4.1	8.4	4
SEP													
08...	0.28	205	0.51	1.1	<0.04	<0.06	<0.008	0.076	0.101	0.199	3.0	9.6	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Anti-mony, water, fltrd, ug/L (01095)	Arsenic water, fltrd, ug/L (01000)	Barium, water, fltrd, ug/L (01005)	Beryll-ium, water, fltrd, ug/L (01010)	Boron, water, fltrd, ug/L (01020)	Cadmium water, fltrd, ug/L (01025)	Chrom-ium, water, fltrd, ug/L (01030)	Cobalt water, fltrd, ug/L (01035)	Copper, water, fltrd, ug/L (01040)	Iron, water, fltrd, ug/L (01046)	Lead, water, fltrd, ug/L (01049)	Lithium water, fltrd, ug/L (01130)	Mangan-ese, water, fltrd, ug/L (01056)
OCT													
17...	--	0.8	--	--	20	--	--	--	--	103	--	2.2	--
DEC													
03...	--	0.7	--	--	28	--	--	--	--	42	--	3.8	--
FEB													
20...	--	0.5	--	--	42	--	--	--	--	38	--	4.4	--
MAR													
20...	--	0.5	--	--	23	--	--	--	--	40	--	3.3	--
APR													
17...	--	0.7	--	--	25	--	--	--	--	24	--	3.1	--
30...	<0.30	0.7	28	<0.06	17	<0.04	<0.8	0.247	1.1	73	0.10	2.4	3.0
MAY													
19...	--	0.7	--	--	22	--	--	--	--	27	--	4.0	--
23...	--	0.8	--	--	19	--	--	--	--	43	--	3.1	--
JUN													
11...	--	1.0	--	--	21	--	--	--	--	20	--	6.2	--
30...	--	1.5	--	--	32	--	--	--	--	E6	--	6.3	--
JUL													
24...	--	1.6	--	--	21	--	--	--	--	12	--	4.7	--
AUG													
19...	<0.30	2.6	39	<0.06	28	<0.04	<0.8	0.266	1.8	E4	0.33	4.8	2.9
SEP													
08...	--	2.8	--	--	26	--	--	--	--	E4	--	4.5	--

05420500 MISSISSIPPI RIVER AT CLINTON, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Molybdenum, water, fltrd, ug/L (01060)	Nickel, water, fltrd, ug/L (01065)	Selenium, water, fltrd, ug/L (01145)	Silver, water, fltrd, ug/L (01075)	Strontium, water, fltrd, ug/L (01080)	Vanadium, water, fltrd, ug/L (01085)	Zinc, water, fltrd, ug/L (01090)	2,6-Diethylaniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Acetochlor, water, fltrd, ug/L (49260)	Alachlor, water, fltrd, ug/L (46342)	alpha-HCH, water, fltrd, ug/L (34253)	alpha-HCH-d6, surrog, wat flt 0.7u GF percent recovry (91065)
OCT													
17...	--	--	<0.5	--	51.8	1.5	--	<0.006	E.027	<0.006	<0.004	<0.005	99.1
DEC													
03...	--	--	0.5	--	79.4	1.7	--	<0.006	E.023	<0.006	<0.004	<0.005	102
FEB													
20...	--	--	E.4	--	90.8	1.7	--	<0.006	E.030	<0.006	<0.004	<0.005	96.4
MAR													
20...	--	--	E.3	--	66.9	0.8	--	<0.006	E.035	<0.006	<0.004	<0.005	94.4
APR													
17...	--	--	E.3	--	63.2	2.8	--	<0.006	E.020	0.008	<0.004	<0.005	89.8
30...	0.6	1.90	<0.5	<0.2	54.9	1.8	2	<0.006	E.013	0.018	<0.004	<0.005	91.2
MAY													
19...	--	--	E.5	--	70.9	1.5	--	<0.006	E.033	0.142	0.005	<0.005	101
23...	--	--	E.4	--	54.9	1.5	--	<0.006	E.025	0.096	0.006	<0.005	103
JUN													
11...	--	--	0.9	--	95.1	1.9	--	<0.006	E.028	0.071	E.003	<0.005	83.4
30...	--	--	0.9	--	87.9	2.5	--	<0.006	E.032	0.056	<0.004	<0.005	97.1
JUL													
24...	--	--	0.6	--	83.3	2.6	--	<0.006	E.044	0.020	<0.004	<0.005	86.3
AUG													
19...	1.3	3.01	0.6	<0.2	90.3	4.0	6	<0.006	E.031	E.005	<0.004	<0.005	96.2
SEP													
08...	--	--	0.6	--	85.2	3.5	--	<0.006	E.024	<0.006	<0.004	<0.005	90.2

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Atrazine, water, fltrd, ug/L (39632)	Azinphosmethyl, water, fltrd 0.7u GF ug/L (82686)	Benfluralin, water, fltrd 0.7u GF ug/L (82673)	Butylate, water, fltrd, ug/L (04028)	Carbaryl, water, fltrd 0.7u GF ug/L (82680)	Carbofuran, water, fltrd 0.7u GF ug/L (82674)	Chlorpyrifos water, fltrd, ug/L (38933)	cis-Permethrin water fltrd 0.7u GF ug/L (82687)	Cyanazine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Diazinon, water, fltrd, ug/L (39572)	Diazinon-d10 surrog. wat flt 0.7u GF percent recovry (91063)	Dieldrin, water, fltrd, ug/L (39381)
OCT													
17...	0.086	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	112	<0.005
DEC													
03...	0.043	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	104	<0.005
FEB													
20...	0.032	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	104	<0.005
MAR													
20...	0.036	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	119	<0.005
APR													
17...	0.036	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	104	<0.005
30...	0.037	<0.050	<0.010	0.000	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	104	<0.005
MAY													
19...	0.237	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	109	<0.005
23...	0.163	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	115	<0.005
JUN													
11...	0.110	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	110	<0.005
30...	0.196	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	120	<0.005
JUL													
24...	0.276	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	92.7	<0.005
AUG													
19...	0.148	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	116	<0.005
SEP													
08...	0.091	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	100	<0.005

05420500 MISSISSIPPI RIVER AT CLINTON, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Disulfoton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethalfluralin, water, fltrd 0.7u GF ug/L (82663)	Ethoprop, water, fltrd 0.7u GF ug/L (82672)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Malathion, water, fltrd, ug/L (39532)	Methyl parathion, water, fltrd 0.7u GF ug/L (82667)	Metolachlor, water, fltrd, ug/L (39415)	Metribuzin, water, fltrd, ug/L (82630)	Molinate, water, fltrd 0.7u GF ug/L (82671)	Napropamide, water, fltrd 0.7u GF ug/L (82684)
OCT													
17...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.009	<0.006	<0.002	<0.007
DEC													
03...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.005	<0.006	<0.002	<0.007
FEB													
20...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.008	<0.006	<0.002	<0.007
MAR													
20...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.013	<0.006	<0.002	<0.007
APR													
17...	<0.02	0.003	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.046	<0.006	<0.002	<0.007
30...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.027	<0.006	<0.002	<0.007
MAY													
19...	<0.02	0.003	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.123	<0.006	<0.002	<0.007
23...	<0.02	0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.085	<0.006	<0.002	<0.007
JUN													
11...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.059	<0.006	<0.002	<0.007
30...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.052	<0.006	<0.002	<0.007
JUL													
24...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.037	<0.006	<0.002	<0.007
AUG													
19...	<0.02	<0.004	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.050	E.012	<0.006	<0.002	<0.007
SEP													
08...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.007	<0.006	<0.002	<0.007

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	p,p'-DDE, water, fltrd, ug/L (34653)	Parathion, water, fltrd, ug/L (39542)	Pebulate, water, fltrd 0.7u GF ug/L (82669)	Pendimethalin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prometon, water, fltrd, ug/L (04037)	Pronamide, water, fltrd 0.7u GF ug/L (82676)	Propachlor, water, fltrd, ug/L (04024)	Propanil, water, fltrd 0.7u GF ug/L (82679)	Propargite, water, fltrd 0.7u GF ug/L (82685)	Simazine, water, fltrd, ug/L (04035)	Tebuthiuron water fltrd 0.7u GF ug/L (82670)	Terbacil, water, fltrd 0.7u GF ug/L (82665)
OCT													
17...	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	0.011	<0.02	<0.034
DEC													
03...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034
FEB													
20...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034
MAR													
20...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034
APR													
17...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	0.007	<0.02	<0.034
30...	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	0.010	<0.02	<0.034
MAY													
19...	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	0.013	<0.02	<0.034
23...	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	0.013	<0.02	<0.034
JUN													
11...	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	0.005	<0.02	<0.034
30...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034
JUL													
24...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.010	<0.02	<0.034
AUG													
19...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	0.009	<0.02	<0.034
SEP													
08...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.010	<0.010	<0.011	<0.02	E.005	<0.02	<0.034

05420500 MISSISSIPPI RIVER AT CLINTON, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Terbufos, water, fltrd 0.7u GF ug/L (82675)	Thiobencarb water fltrd 0.7u GF ug/L (82681)	Triallate, water, fltrd 0.7u GF ug/L (82678)	Trifluralin, water, fltrd 0.7u GF ug/L (82661)	Uranium natural water, fltrd, ug/L (22703)	Suspended sediment load, tons/d (80155)
OCT						
17...	<0.02	<0.005	<0.002	<0.009	--	22,000
DEC						
03...	<0.02	<0.005	<0.002	<0.009	--	2,940
FEB						
20...	<0.02	<0.005	<0.002	<0.009	--	397
MAR						
20...	<0.02	<0.005	<0.002	<0.009	--	5,110
APR						
17...	<0.02	<0.005	<0.002	<0.009	--	11,000
30...	<0.02	<0.005	<0.002	<0.009	0.55	50,200
MAY						
19...	<0.02	<0.005	<0.002	<0.009	--	40,500
23...	<0.02	<0.005	<0.002	<0.009	--	46,500
JUN						
11...	<0.02	<0.005	<0.002	<0.009	--	8,190
30...	<0.02	<0.005	<0.002	<0.009	--	4,890
JUL						
24...	<0.02	<0.005	<0.002	<0.009	--	4,840
AUG						
19...	<0.02	<0.005	<0.002	<0.009	1.28	1,720
SEP						
08...	<0.02	<0.005	<0.002	<0.009	--	986

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Temperature, water, deg C (00010)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)
OCT				
17...	1015	10.9	97	85
DEC				
03...	1140	--	99	36
MAR				
20...	1025	0.9	95	38
APR				
17...	1025	11.2	99	93
30...	1040	14.1	97	138
MAY				
19...	1025	--	82	154
23...	1050	--	97	98
JUN				
30...	1110	24.4	99	36
JUL				
24...	1020	25.0	99	33
AUG				
19...	1045	27.4	99	31
SEP				
08...	1125	24.6	96	29

THIS PAGE IS INTENTIONALLY BLANK

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA

LOCATION.--Lat 42°50'10", long 92°15'26", in NW¼ SW¼ SW¼ sec. 27, T.93 N., R.12 W., Bremer County, Hydrologic Unit 07080102, on left downstream bank 40 ft from bridge on State Highway 93, 1.0 mile upstream of the mouth of the East Fork of the Wapsipinicon River, and 2.0 miles north of Tripoli.

DRAINAGE AREA.--343 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to July 1977 (operated as a partial-record low flow measurement site). Discharge records April 1996 to September 1998; October 1, 2000 to current year. Stage-only records May 13 to September 30, 2000.

REVISIONS.--WDR-IA-98-1: 1997(M)

GAGE.--Water stage recorder. Datum of gage is 1,000 ft above NGVD of 1929, from map.

REMARKS.--Records good except for those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 1, 1969, discharge about 18,900 ft^3/s, gage height 17.26 ft: Flood of May 17, 1999, discharge 3,900 ft^3/s, gage height 14.39 ft; Flood of July 21, 1999, discharge 19,400 ft^3/s, gage height 18.50 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	41	e28	e27	e14	e28	e91	230	149	214	63	22
2	36	40	e25	e25	e15	e26	101	298	131	182	72	20
3	37	40	e25	e23	e15	e23	90	245	135	156	68	19
4	52	41	e26	e22	e14	e22	84	217	134	144	62	18
5	74	40	e24	e22	e14	e22	81	352	129	144	57	17
6	91	40	e23	e22	e13	e27	79	629	133	133	55	16
7	98	40	e25	e23	e12	e30	82	924	225	136	53	15
8	91	39	e24	e25	e12	e30	79	1,310	453	289	51	e14
9	81	39	e23	e23	e12	e29	78	1,530	622	552	49	e14
10	73	39	e25	e19	e12	e32	86	1,570	631	784	48	e14
11	66	39	e24	e21	e12	e38	101	1,600	577	890	43	e13
12	60	38	e30	e21	e13	e43	140	1,440	514	893	41	14
13	54	37	e29	e20	e12	e54	179	1,280	429	820	40	15
14	49	36	e32	e19	e13	e65	186	1,230	360	620	38	19
15	45	34	e34	e17	e14	e81	174	1,220	305	434	37	19
16	41	33	e30	e18	e13	e86	165	1,370	261	332	32	20
17	42	32	e32	e19	e16	e66	171	1,260	226	265	31	18
18	41	30	e34	e18	e26	e72	194	1,130	201	223	31	20
19	40	32	e32	e17	e35	e66	220	865	179	190	30	25
20	39	32	e30	e17	e41	e57	278	655	158	162	29	23
21	38	32	e29	e17	e41	e52	370	524	141	148	27	25
22	37	31	e26	e18	e38	e49	388	430	130	139	25	25
23	36	32	e19	e16	e36	e52	354	376	121	138	25	23
24	37	29	e26	e15	e31	e57	305	334	121	124	25	22
25	39	28	e30	e15	e28	e61	263	296	138	112	25	20
26	40	e29	e33	e14	e25	e63	228	263	220	104	24	20
27	41	e20	e28	e12	e31	e63	200	233	274	97	24	20
28	43	e24	e31	e12	e33	e66	175	210	e297	86	24	19
29	42	e27	e33	e12	---	e72	153	186	e283	75	23	19
30	42	e25	e32	e12	---	e77	154	173	e249	70	22	16
31	42	---	e29	e12	---	e82	---	160	---	66	21	---
TOTAL	1,581	1,019	871	573	591	1,591	5,249	22,540	7,926	8,722	1,195	564
MEAN	51.0	34.0	28.1	18.5	21.1	51.3	175	727	264	281	38.5	18.8
MAX	98	41	34	27	41	86	388	1,600	631	893	72	25
MIN	34	20	19	12	12	22	78	160	121	66	21	13
AC-FT	3,140	2,020	1,730	1,140	1,170	3,160	10,410	44,710	15,720	17,300	2,370	1,120
CFSM	0.15	0.10	0.08	0.05	0.06	0.15	0.51	2.10	0.76	0.81	0.11	0.05
IN.	0.17	0.11	0.09	0.06	0.06	0.17	0.56	2.42	0.85	0.94	0.13	0.06

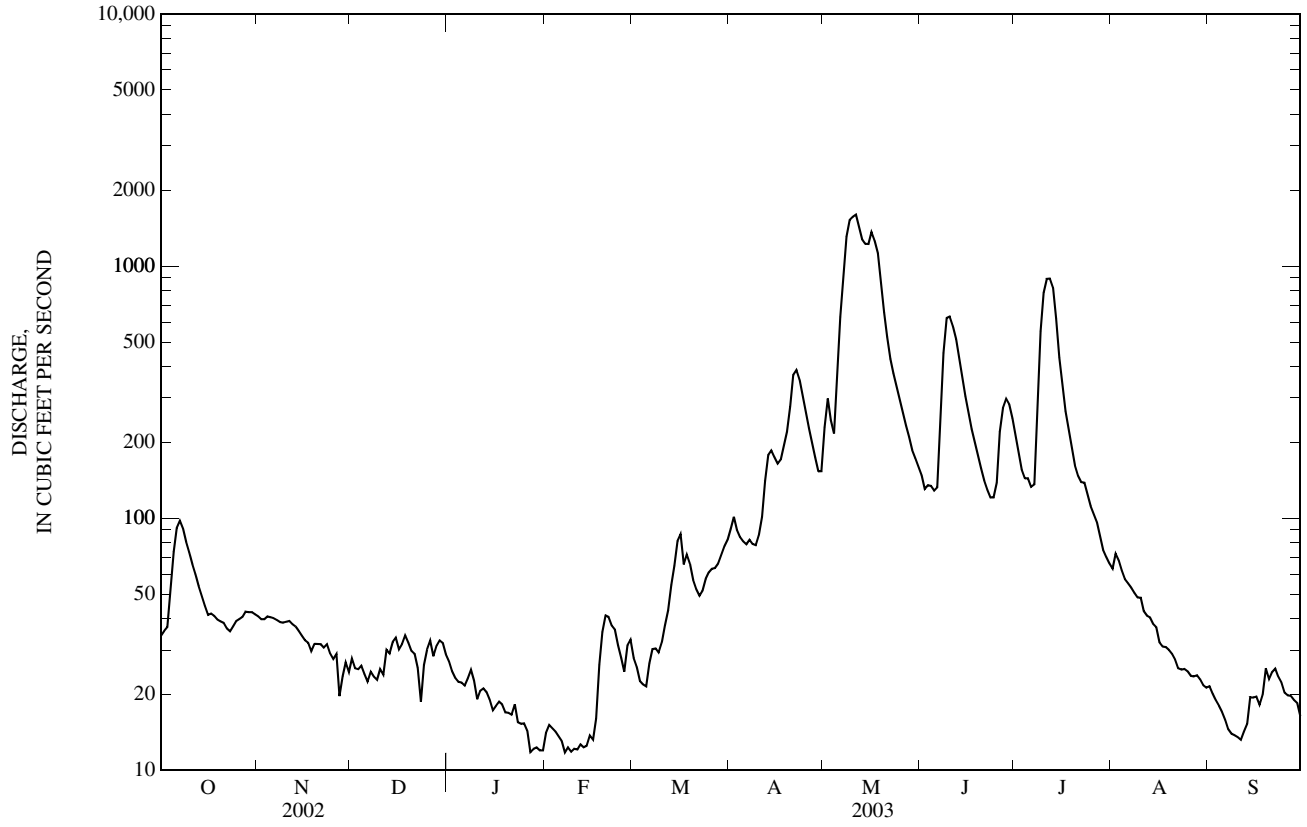
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2003, BY WATER YEAR (WY)

MEAN	149	75.9	50.5	49.1	132	463	649	460	527	210	88.4	59.5
MAX	407	114	84.5	77.0	275	1,354	1,648	816	1,172	517	229	128
(WY)	(1998)	(2001)	(1997)	(1997)	(1998)	(1997)	(2001)	(2001)	(1998)	(1998)	(2002)	(1997)
MIN	27.1	34.0	28.1	18.5	21.1	51.3	175	174	188	69.2	36.0	18.8
(WY)	(1997)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(1996)	(1997)	(2001)	(2001)	(2003)

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1996 - 2003	
ANNUAL TOTAL	46,122		52,422			
ANNUAL MEAN	126		144		243	
HIGHEST ANNUAL MEAN					367	1998
LOWEST ANNUAL MEAN					127	2002
HIGHEST DAILY MEAN	1,080	Jun 24	1,600	May 11	3,830	Apr 14, 2001
LOWEST DAILY MEAN	19	Jan 1	12	Jan 27ab	12	Jan 27, 2003ab
ANNUAL SEVEN-DAY MINIMUM	24	Dec 5	12	Feb 7b	12	Feb 7, 2003b
MAXIMUM PEAK FLOW			1,660	May 11	4,730	Jun 29, 1998
MAXIMUM PEAK STAGE			12.51	May 11	14.91	Jun 29, 1998
ANNUAL RUNOFF (AC-FT)	91,480		104,000		176,200	
ANNUAL RUNOFF (CFSM)	0.37		0.42		0.70	
ANNUAL RUNOFF (INCHES)	4.96		5.64		9.55	
10 PERCENT EXCEEDS	298		341		627	
50 PERCENT EXCEEDS	62		40		78	
90 PERCENT EXCEEDS	28		17		29	

a Also Jan. 28-31, Feb. 7-11, 13.
b Ice affected.
e Estimated.



05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 2001 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Gage height, feet (00065)	Instantaneous discharge, cfs (00061)	Turbidity, water, unfltrd field, NTU (61028)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)
OCT													
01...	0946	7.12	35	6.9	732	9.0	95	7.7	425	--	18.0	148	179
NOV													
04...	1005	7.36	40	5.2	736	14.0	104	7.0	460	--	2.6	142	172
DEC													
03...	0945	7.13	24	7.0	746	15.5	106	7.3	506	--	0.1	162	196
JAN													
07...	0946	7.17	8.8	5.8	733	22.1	152	7.8	495	-6.0	0.1	145	175
FEB													
03...	1043	7.06	10	2.8	720	4.6	33	7.3	593	2.0	0.1	200	243
APR													
02...	0929	7.70	103	2.8	730	10.8	93	7.7	409	--	8.3	126	153
MAY													
05...	1014	9.22	327	18	718	10.4	99	7.9	440	--	10.4	116	142
JUN													
03...	0930	8.09	135	16	732	9.2	95	8.1	450	--	15.0	129	157
JUL													
08...	0954	9.09	305	19	735	6.9	86	7.9	438	16.0	24.4	124	151
AUG													
05...	0953	7.35	55	14	734	10.2	120	8.0	394	--	21.5	143	174
13...	1130	7.20	39	6.1	--	13.2	--	8.9	390	--	25.2	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	2,6-Diethylaniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Acetochlor, water, fltrd, ug/L (49260)	Alachlor, water, fltrd, ug/L (46342)
OCT													
01...	0.0	20.1	25.2	0.34	<0.04	1.65	0.078	<0.02	0.087	<0.006	E.071	0.021	0.005
NOV													
04...	1	24.7	25.9	0.31	<0.04	3.37	0.011	0.02	0.077	--	--	--	--
DEC													
03...	0.0	26.0	29.2	0.27	E.02	4.02	0.021	E.01	0.061	<0.006	E.064	0.024	E.013
JAN													
07...	0.0	25.3	28.7	0.25	<0.04	3.68	0.017	E.01	0.074	E.001	E.049	0.018	0.015
FEB													
03...	--	30.2	32.1	0.49	0.20	3.99	0.057	E.01	0.064	<0.006	E.084	0.010	0.010
APR													
02...	0.0	27.6	24.3	0.86	0.16	3.65	0.056	0.03	0.113	<0.006	E.047	0.087	0.016
MAY													
05...	--	26.9	21.3	0.74	<0.04	7.03	0.021	<0.02	0.112	<0.006	E.078	0.264	0.014
JUN													
03...	--	24.5	22.9	0.79	<0.04	7.64	0.041	--	0.101	<0.006	E.115	0.051	0.008
JUL													
08...	--	24.1	19.8	0.88	<0.04	7.68	0.034	0.06	0.22	<0.006	E.141	0.105	0.009
AUG													
05...	--	21.2	22.5	0.39	<0.04	2.07	0.014	0.06	0.119	<0.006	E.050	0.027	<0.004
13...	--	--	--	--	--	--	--	--	--	--	--	--	--

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	alpha-HCH, water, fltrd, ug/L (34253)	Atrazine, water, fltrd, ug/L (39632)	Azinphos-methyl, water, fltrd 0.7u GF ug/L (82686)	Benfluralin, water, fltrd 0.7u GF ug/L (82673)	Butylate, water, fltrd, ug/L (04028)	Carbaryl, water, fltrd 0.7u GF ug/L (82680)	Carbofuran, water, fltrd 0.7u GF ug/L (82674)	Chlorpyrifos water, fltrd, ug/L (38933)	cis-Permethrin water fltrd 0.7u GF ug/L (82687)	Cyanazine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Diazinon, water, fltrd, ug/L (39572)	Dieldrin, water, fltrd, ug/L (39381)
OCT													
01...	<0.005	0.093	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
NOV													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
03...	<0.005	0.071	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
JAN													
07...	<0.005	0.058	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	E.002	<0.005	<0.005
FEB													
03...	<0.005	0.067	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
APR													
02...	<0.005	0.101	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
MAY													
05...	<0.005	0.265	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
JUN													
03...	<0.005	0.341	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
JUL													
08...	<0.005	0.503	<0.050	<0.010	<0.002	<0.041	E.053	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
AUG													
05...	<0.005	0.111	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
13...	--	--	--	--	--	--	--	--	--	--	--	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Disulfoton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethalfluralin, water, fltrd 0.7u GF ug/L (82663)	Ethoprop, water, fltrd 0.7u GF ug/L (82672)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Malathion, water, fltrd, ug/L (39532)	Methyl parathion, water, fltrd 0.7u GF ug/L (82667)	Metolachlor, water, fltrd, ug/L (39415)	Metribuzin, water, fltrd, ug/L (82630)	Molinate, water, fltrd 0.7u GF ug/L (82671)	Napropamide, water, fltrd 0.7u GF ug/L (82684)
OCT													
01...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.057	<0.006	<0.002	<0.007
NOV													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
03...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.061	<0.006	<0.002	<0.007
JAN													
07...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.054	<0.006	<0.002	<0.007
FEB													
03...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.043	<0.006	<0.002	<0.007
APR													
02...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.113	<0.006	<0.002	<0.007
MAY													
05...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.413	<0.006	<0.002	<0.007
JUN													
03...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.065	<0.006	<0.002	<0.007
JUL													
08...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.098	<0.006	<0.002	<0.007
AUG													
05...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.040	<0.006	<0.002	<0.007
13...	--	--	--	--	--	--	--	--	--	--	--	--	--

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	p,p-' DDE, water, fltrd, ug/L (34653)	Para-thion, water, fltrd, ug/L (39542)	Peb-ulate, water, fltrd 0.7u GF ug/L (82669)	Pendi-meth-alin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prome-ton, water, fltrd, ug/L (04037)	Pron-amide, water, fltrd 0.7u GF ug/L (82676)	Propa-chlor, water, fltrd, ug/L (04024)	Pro-panil, water, fltrd 0.7u GF ug/L (82679)	Propar-gite, water, fltrd 0.7u GF ug/L (82685)	Tebu-thiuron water fltrd 0.7u GF ug/L (82670)	Terba-cil, water, fltrd 0.7u GF ug/L (82665)	Terbu-fos, water, fltrd 0.7u GF ug/L (82675)
OCT													
01...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
NOV													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
03...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
JAN													
07...	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
FEB													
03...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
APR													
02...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
MAY													
05...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
JUN													
03...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
JUL													
08...	<0.003	<0.010	<0.004	<0.022	<0.011	0.07	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
AUG													
05...	<0.003	<0.010	<0.004	<0.022	<0.011	0.02	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
13...	--	--	--	--	--	--	--	--	--	--	--	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Thio-bencarb water fltrd 0.7u GF ug/L (82681)	Tri-allate, water, fltrd 0.7u GF ug/L (82678)	Tri-flur-alin, water, fltrd 0.7u GF ug/L (82661)	Sus-pended sedi-ment concen-tration mg/L (80154)
OCT				
01...	<0.005	<0.002	<0.009	5
NOV				
04...	--	--	--	2
DEC				
03...	<0.005	<0.002	<0.009	86
JAN				
07...	<0.005	<0.002	<0.009	4
FEB				
03...	<0.005	<0.002	<0.009	43
APR				
02...	<0.005	<0.002	<0.009	4
MAY				
05...	<0.005	<0.002	<0.009	18
JUN				
03...	<0.005	<0.002	<0.009	9
JUL				
08...	<0.005	<0.002	<0.009	20
AUG				
05...	<0.005	<0.002	<0.009	11
13...	--	--	--	--

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA—Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--April 10, 1996 to September 30, 1998; June 1, 2000 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation 2.40 in., June 21, 1997.

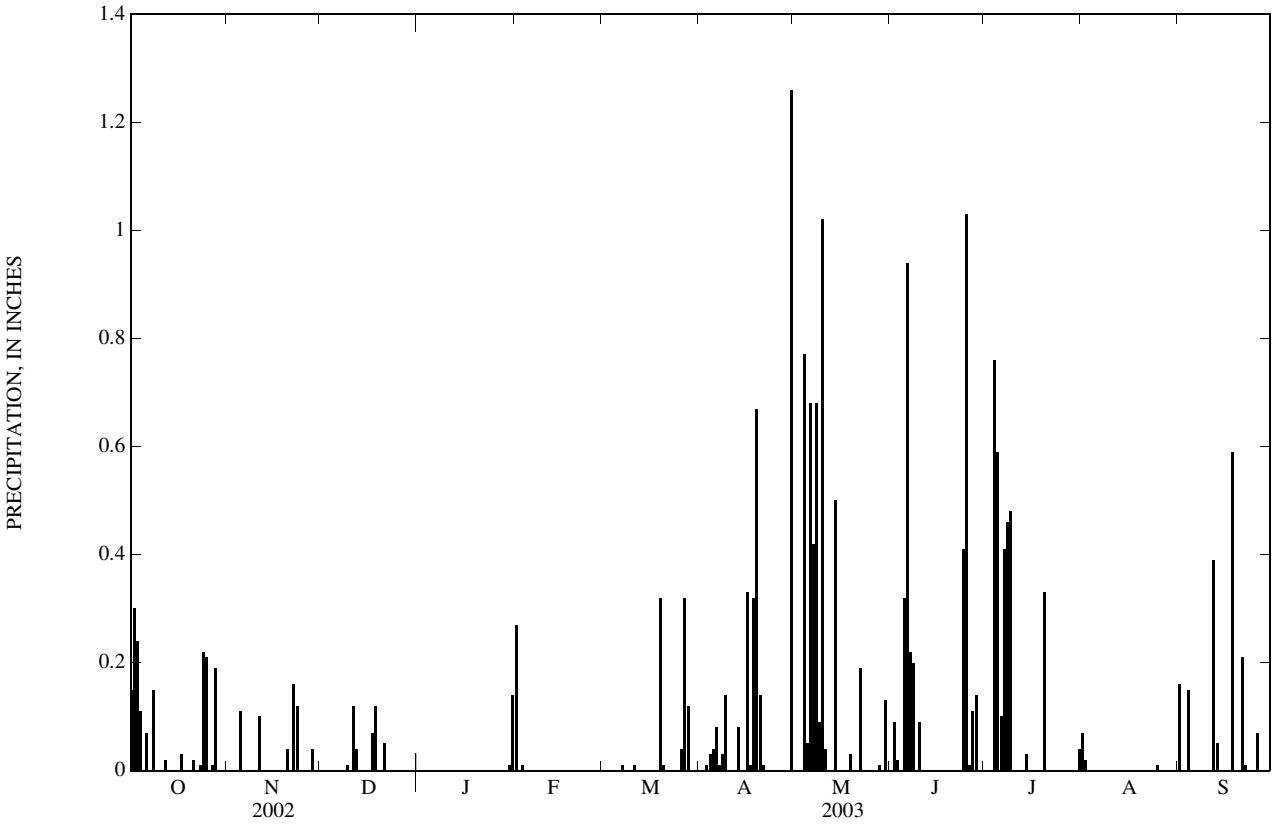
EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 1.26 in., Apr. 30.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.15	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.07	0.16
2	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.02	0.00
3	0.24	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.00	0.00
4	0.11	0.00	0.00	0.00	0.00	0.00	0.03	0.77	0.00	0.76	0.00	0.15
5	0.00	0.11	0.00	0.00	0.00	0.00	0.04	0.05	0.32	0.59	0.00	0.00
6	0.07	0.00	0.00	0.00	0.00	0.00	0.08	0.68	0.94	0.10	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.42	0.22	0.41	0.00	0.00
8	0.15	0.00	0.00	0.00	0.00	0.00	0.03	0.68	0.20	0.46	0.00	0.00
9	0.00	0.00	0.01	0.00	0.00	0.00	0.14	0.09	0.00	0.48	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.09	0.00	0.00	0.00
11	0.00	0.10	0.12	0.00	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.00
12	0.02	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
13	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.05
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.03	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00
17	0.03	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.12	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.59
19	0.00	0.00	0.00	0.00	0.00	0.32	0.67	0.03	0.00	0.00	0.00	0.00
20	0.00	0.04	0.00	0.00	0.00	0.01	0.14	0.00	0.00	0.33	0.00	0.00
21	0.02	0.00	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.21
22	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.01
23	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00
25	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.00	0.01	0.00
26	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	e0.01	0.00	0.00	0.07
27	0.01	0.00	0.00	0.00	0.00	0.32	0.00	0.00	e0.11	0.00	0.00	0.00
28	0.19	0.04	0.00	0.00	0.00	0.12	0.00	0.01	e0.14	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	e0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.01	---	0.00	1.26	0.13	e0.00	0.00	0.00	0.00
31	0.00	---	0.00	0.14	---	0.00	---	0.00	---	0.04	0.00	---
TOTAL	1.73	0.57	0.41	0.15	0.28	0.83	3.16	4.61	3.58	3.20	0.10	1.63
MEAN	0.06	0.02	0.01	0.00	0.01	0.03	0.11	0.15	0.12	0.10	0.00	0.05
MAX	0.30	0.16	0.12	0.14	0.27	0.32	1.26	1.02	1.03	0.76	0.07	0.59
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

e Estimated

05420680 WAPSIPINICON RIVER NEAR TRIPOLI, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IA

LOCATION.--Lat 42°27'49", long 91°53'42", in SE$^1/_4$ sec.4, T.88 N., R.9 W., Buchanan County, Hydrologic Unit 07080102, on right bank at Sixth Street in Independence, 1,800 ft downstream from dam at abandoned hydroelectric plant, 4.9 mi downstream from Otter Creek, 9.7 mi upstream from Pine Creek, and at mile 142.5.

DRAINAGE AREA.--1,048 mi^2.

PERIOD OF RECORD.--July 1933 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1938-39, 1940 (M), 1947.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 882.85 ft above NGVD of 1929. Prior to May 24, 1941 nonrecording gage in tailrace of powerplant 1,800 ft upstream at datum 80.00 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1901, that of May 18, 1999.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103	137	84	e106	e38	e41	226	682	575	551	256	49
2	118	133	106	e103	e40	e39	216	909	539	498	224	48
3	118	136	93	e97	e37	e37	208	977	519	442	203	49
4	135	134	98	e98	e36	e40	209	940	493	410	194	44
5	124	140	99	e97	e34	e39	193	1,020	473	512	188	42
6	134	139	95	e94	e33	e38	173	1,330	476	875	180	42
7	125	135	94	e95	e37	e36	202	1,580	520	841	165	42
8	145	138	94	e97	e35	e35	198	1,930	800	1,400	152	41
9	163	132	88	e96	e34	e37	191	2,700	1,190	1,730	144	40
10	162	140	89	e78	e33	e38	192	3,580	1,400	2,250	132	39
11	153	134	91	e75	e33	e39	213	4,580	1,500	2,170	123	39
12	154	128	94	e78	e36	e40	246	4,670	1,480	2,020	118	41
13	134	128	98	e78	e40	e41	270	4,380	1,330	1,860	113	51
14	123	133	99	e75	e43	63	305	4,220	1,160	1,660	108	64
15	127	128	101	e67	e39	93	328	4,760	1,000	1,500	103	56
16	116	127	102	e65	e38	125	332	4,920	866	1,220	97	52
17	119	125	108	e61	e38	180	331	4,170	759	954	89	47
18	123	125	117	e57	e36	262	307	3,440	679	764	84	52
19	119	124	126	e53	e35	312	346	3,000	605	639	79	60
20	114	125	127	e50	e35	314	412	2,650	530	563	75	53
21	120	128	118	e49	e37	305	540	2,240	471	760	75	56
22	114	121	120	e48	e39	285	648	1,760	421	735	66	65
23	112	123	e112	e45	e42	253	694	1,430	384	598	62	59
24	118	120	e117	e44	e46	229	685	1,220	356	502	61	64
25	136	114	e119	e46	e48	214	633	1,080	387	435	60	56
26	138	106	e121	e45	e51	203	564	958	436	383	60	55
27	131	95	e110	e43	e48	208	504	848	506	339	54	60
28	137	98	e110	e43	e45	221	457	790	647	299	48	57
29	139	116	e113	e41	---	213	410	691	645	272	51	52
30	142	111	e116	e37	---	209	461	659	594	253	50	52
31	142	---	e111	e38	---	211	---	615	---	298	49	---
TOTAL	4,038	3,773	3,270	2,099	1,086	4,400	10,694	68,729	21,741	27,733	3,463	1,527
MEAN	130	126	105	67.7	38.8	142	356	2,217	725	895	112	50.9
MAX	163	140	127	106	51	314	694	4,920	1,500	2,250	256	65
MIN	103	95	84	37	33	35	173	615	356	253	48	39
AC-FT	8,010	7,480	6,490	4,160	2,150	8,730	21,210	136,300	43,120	55,010	6,870	3,030
CFSM	0.12	0.12	0.10	0.06	0.04	0.14	0.34	2.12	0.69	0.85	0.11	0.05
IN.	0.14	0.13	0.12	0.07	0.04	0.16	0.38	2.44	0.77	0.98	0.12	0.05

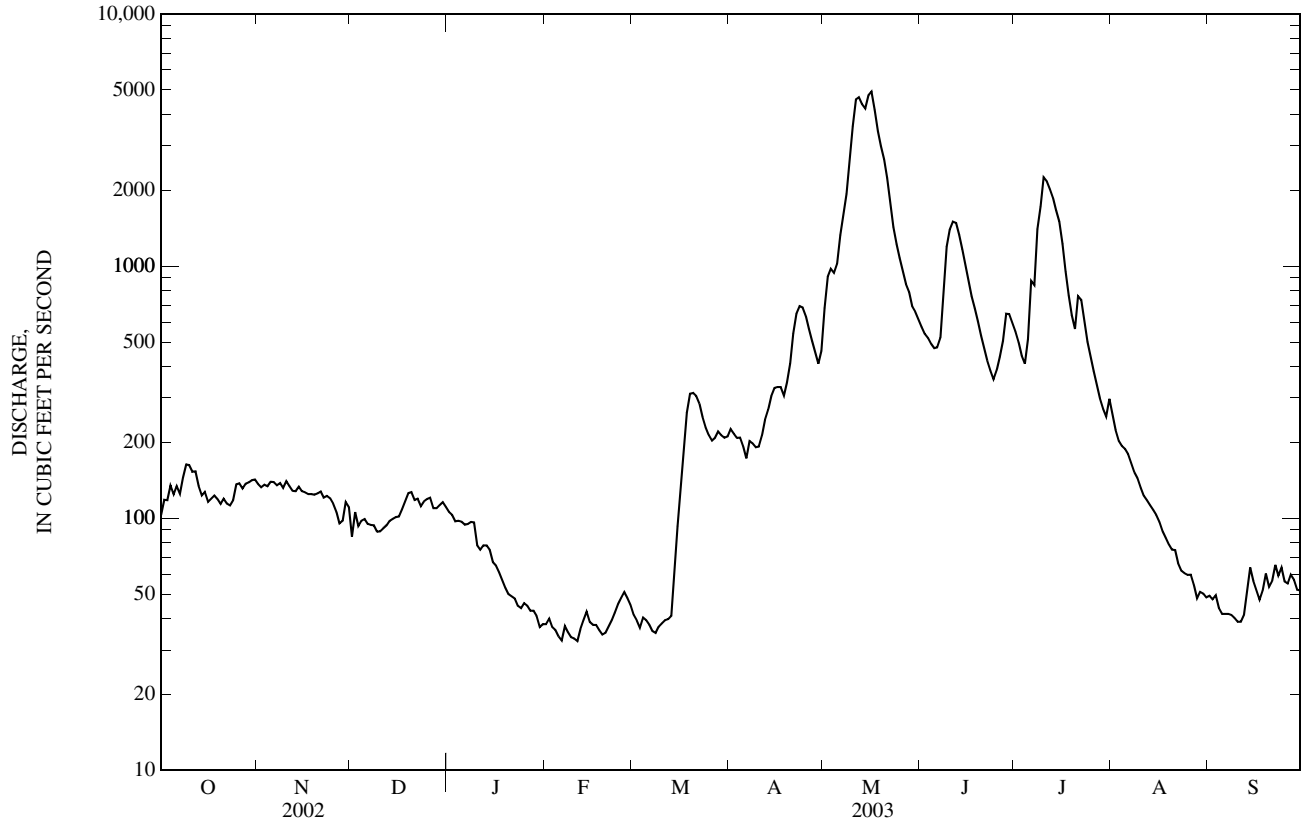
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 2003, BY WATER YEAR (WY)

MEAN	387	439	298	220	352	1,391	1,364	1,009	1,015	735	541	362
MAX	2,306	2,280	1,962	1,411	1,698	3,201	5,578	4,326	4,721	4,836	5,443	1,940
(WY)	(1973)	(1992)	(1992)	(1946)	(1984)	(1986)	(1993)	(1999)	(1947)	(1993)	(1993)	(1981)
MIN	29.3	42.2	26.9	12.6	19.0	68.4	198	45.3	12.4	18.9	21.5	20.5
(WY)	(1989)	(1977)	(1977)	(1977)	(1956)	(1934)	(1957)	(1934)	(1934)	(1936)	(1934)	(1976)

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1934 - 2003	
ANNUAL TOTAL	150,420		152,553			
ANNUAL MEAN	412		418		677	
HIGHEST ANNUAL MEAN					2,304	1993
LOWEST ANNUAL MEAN					74.5	1934
HIGHEST DAILY MEAN	6,280	Jun 5	4,920	May 16	28,000	May 18, 1999
LOWEST DAILY MEAN	84	Dec 1	33	Feb 6a	7.0	Oct 1, 1933b
ANNUAL SEVEN-DAY MINIMUM	91	Sep 12	34	Feb 5	7.1	Jan 24, 1977
MAXIMUM PEAK FLOW			5,060	May 16	31,100	May 18, 1999
MAXIMUM PEAK STAGE			8.70	May 16	22.35	May 18, 1999
ANNUAL RUNOFF (AC-FT)	298,400		302,600		490,700	
ANNUAL RUNOFF (CFSM)	0.39		0.40		0.65	
ANNUAL RUNOFF (INCHES)	5.34		5.42		8.78	
10 PERCENT EXCEEDS	902		1,010		1,660	
50 PERCENT EXCEEDS	202		125		273	
90 PERCENT EXCEEDS	105		40		53	

a Also Feb. 10, 11; ice affected.
b Many days in 1934 when power plant shut down; Jan. 25-30, 1977.
e Estimated.



05421740 WAPSIPINICON RIVER AT ANAMOSA, IA

LOCATION.--Lat 42°05'00", long 91°16'02", in SW¼ NW¼ SW¼ sec.13, T.84 N., R.4 W., Jones County, Hydrologic Unit 07080103, on left bank, 6 ft. upstream of bridge on Shaw Road, 1.5 miles downstream from dam at Anamosa, and 700 feet upstream of the mouth of Dutch Creek, and an unnamed creek.

DRAINAGE AREA.--1,575 mi^2.

PERIOD OF RECORD.--July 10, 2002 to current year.

GAGE.--Water-stage recorder. Datum of gage is 755.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on June 18, 1968 and May 18, 1999. No gage height or discharge was determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	196	306	e143	e171	e99	e81	323	1,220	1,140	962	525	145
2	473	295	e169	e167	e97	e76	326	1,620	1,080	883	511	141
3	466	309	e156	e161	e96	e73	334	1,570	1,040	811	466	138
4	497	290	e160	e163	e94	e75	330	1,560	985	738	436	135
5	430	299	e163	e161	e90	e77	327	1,590	936	717	402	132
6	404	290	e159	e156	e87	e77	322	1,630	904	938	387	130
7	386	302	e157	e157	e80	e77	324	1,840	913	1,200	371	128
8	368	295	e158	e161	e88	e78	320	2,570	971	2,080	351	114
9	366	289	e153	e160	e82	e80	321	3,110	1,250	3,070	332	116
10	350	289	e157	e144	e78	e87	322	3,420	1,760	3,820	313	118
11	365	280	e161	e141	e76	e89	315	4,080	1,980	3,820	302	113
12	345	295	e166	e143	e80	e117	342	5,190	2,030	3,790	292	117
13	337	273	e169	e144	e83	e159	377	6,170	2,020	3,220	280	196
14	346	280	e175	e142	e84	190	402	6,420	2,030	2,810	272	272
15	318	266	e176	e135	e80	196	427	6,310	1,940	2,520	262	203
16	317	270	e197	e135	e75	251	445	6,490	1,670	2,240	252	173
17	294	267	e203	e131	e73	303	458	6,800	1,470	1,970	241	154
18	308	267	e209	e126	e73	337	460	6,540	1,330	1,640	228	141
19	300	256	e212	e121	e73	352	473	5,850	1,270	1,370	215	145
20	295	269	e214	e117	e75	395	501	4,850	1,100	1,190	214	143
21	291	263	e190	e115	e76	410	551	4,070	975	1,790	204	150
22	289	256	e195	e113	e79	398	623	3,520	866	1,390	195	153
23	287	257	e177	e110	e80	386	720	3,010	780	1,330	187	149
24	282	251	e180	e115	e85	372	805	2,530	780	1,140	181	149
25	302	e243	e182	e112	e90	347	839	2,170	764	1,010	174	143
26	326	e235	e186	e115	e91	329	822	1,930	989	874	181	143
27	325	e168	e178	e109	e90	347	776	1,730	1,230	786	175	146
28	323	e171	e176	e110	e86	331	721	1,560	1,050	709	162	136
29	307	e180	e181	e106	---	329	659	1,430	1,070	636	157	133
30	315	e167	e183	e103	---	327	767	1,330	1,040	577	150	131
31	297	---	e179	e99	---	324	---	1,220	---	521	147	---
TOTAL	10,505	7,878	5,464	4,143	2,340	7,070	14,732	103,330	37,363	50,552	8,565	4,387
MEAN	339	263	176	134	83.6	228	491	3,333	1,245	1,631	276	146
MAX	497	309	214	171	99	410	839	6,800	2,030	3,820	525	272
MIN	196	167	143	99	73	73	315	1,220	764	521	147	113
AC-FT	20,840	15,630	10,840	8,220	4,640	14,020	29,220	205,000	74,110	100,300	16,990	8,700
CFSM	0.22	0.17	0.11	0.08	0.05	0.14	0.31	2.12	0.79	1.04	0.18	0.09
IN.	0.25	0.19	0.13	0.10	0.06	0.17	0.35	2.44	0.88	1.19	0.20	0.10

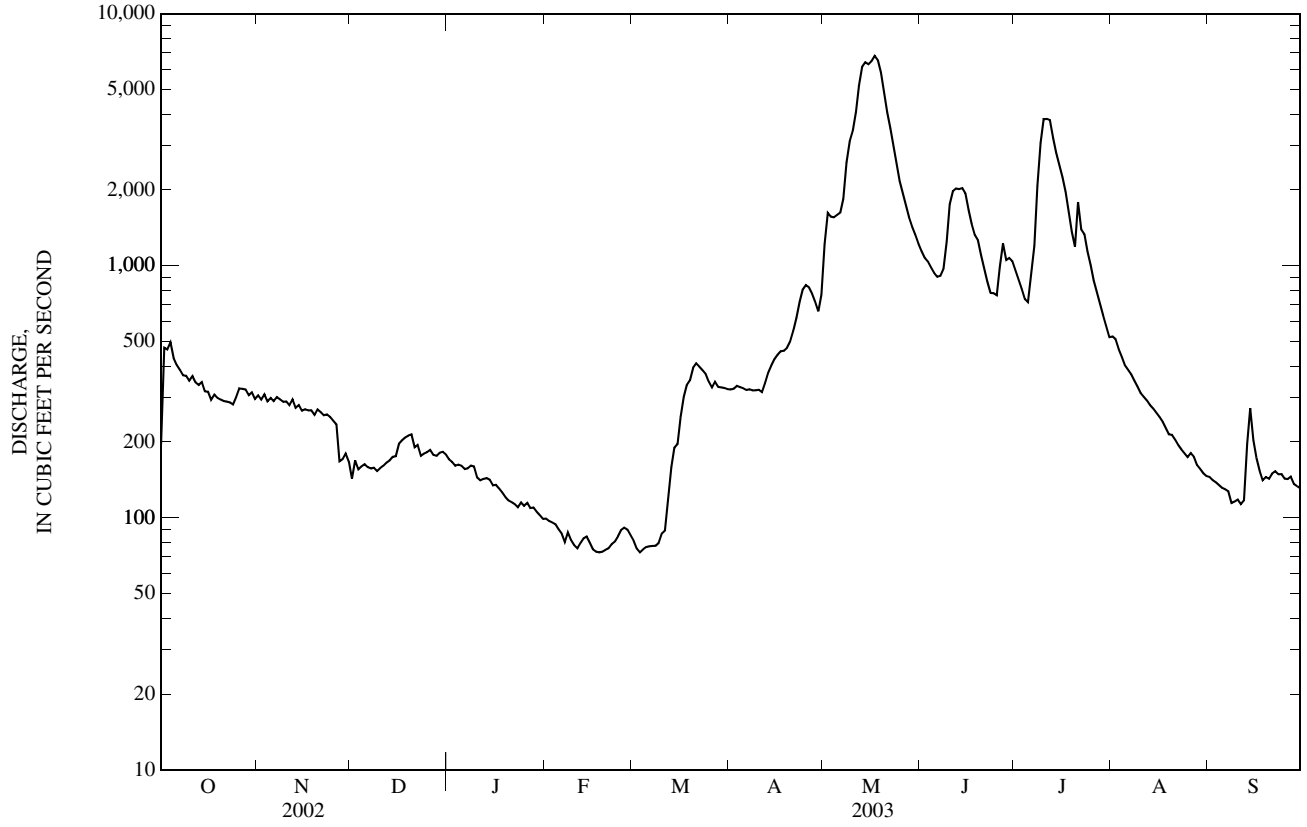
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2002 - 2003, BY WATER YEAR (WY)

MEAN	339	263	176	134	83.6	228	491	3,333	1,245	1,631	486	222
MAX	339	263	176	134	83.6	228	491	3,333	1,245	1,631	696	297
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2002)	(2002)
MIN	339	263	176	134	83.6	228	491	3,333	1,245	1,631	276	146
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)

05421740 WAPSIPINICON RIVER AT ANAMOSA, IA—Continued

SUMMARY STATISTICS	FOR 2003 WATER YEAR		WATER YEARS 2002 - 2003	
ANNUAL TOTAL	256,329			
ANNUAL MEAN	702		702	
HIGHEST ANNUAL MEAN			702	2003
LOWEST ANNUAL MEAN			702	2003
HIGHEST DAILY MEAN	6,800	May 17	6,800	May 17, 2003
LOWEST DAILY MEAN	73	Feb 17a	73	Feb 17, 2003a
ANNUAL SEVEN-DAY MINIMUM	75	Feb 16	75	Feb 16, 2003
MAXIMUM PEAK FLOW	6,990	May 17		
MAXIMUM PEAK STAGE	13.08	May 17		
ANNUAL RUNOFF (AC-FT)	508,400		508,800	
ANNUAL RUNOFF (CFSM)	0.45		0.45	
ANNUAL RUNOFF (INCHES)	6.05		6.06	
10 PERCENT EXCEEDS	1,770		1,770	
50 PERCENT EXCEEDS	291		291	
90 PERCENT EXCEEDS	95		95	

a Also Feb. 18, 19, Mar. 3; ice affected.
e Estimated.



05422000 WAPSIPINICON RIVER NEAR DE WITT, IA

LOCATION.--Lat 41°46'01", long 90°32'05", in SW¼ NE¼ sec.6, T.80 N., R.4 E., Clinton County, Hydrologic Unit 07080103, on left bank 5 ft upstream from bridge on Highway 956, 0.9 mi downstream from Silver Creek, 4.0 mi south of water tower in De Witt, 6.2 mi upstream from Brophy Creek, and 18.2 mi upstream from mouth.

DRAINAGE AREA.--2,330 mi^2.

PERIOD OF RECORD.--July 1934 to current year.

REVISED RECORDS.--WSP 1308: 1937 (M). WSP 1438: Drainage area. WSP 1708: 1951.

GAGE.--Water-stage recorder. Datum of gage is 598.81 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U. S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	402	752	e511	e437	e339	e375	785	1,500	1,710	1,330	892	307
2	521	735	e531	e427	e340	e371	787	1,800	1,590	1,300	834	310
3	2,310	735	e504	e415	e343	e357	790	2,140	1,530	1,250	817	310
4	2,180	729	e465	e409	e325	e341	803	2,260	1,470	1,200	793	307
5	3,350	728	e466	e412	e331	e328	814	2,530	1,410	1,140	761	298
6	2,260	714	e484	e411	e318	e341	806	2,890	1,380	1,110	721	297
7	1,540	700	e478	e402	e312	e330	800	2,700	1,350	1,090	684	290
8	1,270	680	e508	e393	e321	e336	801	2,660	1,340	1,260	655	284
9	1,120	688	e534	e391	e316	e340	773	3,370	1,360	1,700	643	278
10	1,020	680	e551	e400	e310	e365	753	4,630	1,410	3,170	605	269
11	953	678	e561	e390	e305	e328	752	4,550	1,730	3,920	589	262
12	891	655	613	e394	e309	e539	751	4,720	2,100	3,980	570	266
13	850	641	597	e398	e310	e942	745	5,210	2,260	3,940	555	324
14	812	646	592	e402	e306	1,670	726	5,670	2,310	3,710	535	392
15	780	639	602	e413	e301	1,280	744	6,100	2,290	3,220	511	402
16	774	625	605	e413	e299	1,130	806	6,430	2,290	2,910	487	e356
17	745	610	542	e402	e287	1,150	883	6,610	2,100	2,640	471	e339
18	743	618	640	e397	e282	1,060	901	6,830	1,900	2,390	460	329
19	719	627	758	e406	e294	926	911	7,010	1,730	2,110	441	310
20	704	618	710	e403	e311	975	959	7,160	1,600	1,830	435	301
21	680	606	649	e394	e350	982	1,010	6,970	1,510	1,840	453	292
22	664	608	618	e382	e376	955	1,020	6,080	1,370	2,130	449	289
23	647	602	e485	e378	e394	935	1,050	5,050	1,260	1,950	411	290
24	647	592	e526	e378	e387	905	1,100	4,360	1,170	1,680	399	293
25	691	591	e534	e359	e373	896	1,170	3,750	1,120	1,560	387	290
26	759	e571	e491	e368	e360	881	1,230	3,210	1,270	1,390	366	298
27	777	e552	e398	e359	e371	846	1,150	2,810	1,220	1,290	361	293
28	767	e525	e438	e360	e371	840	1,170	2,520	1,360	1,200	338	285
29	766	e570	e437	e351	---	856	1,120	2,240	1,440	1,150	312	276
30	771	e560	e426	e348	---	831	1,190	2,010	1,340	1,030	303	279
31	758	---	e432	e345	---	804	---	1,850	---	956	302	---
TOTAL	31,871	19,275	16,686	12,137	9,241	23,215	27,300	127,620	47,920	61,376	16,540	9,116
MEAN	1,028	642	538	392	330	749	910	4,117	1,597	1,980	534	304
MAX	3,350	752	758	437	394	1,670	1,230	7,160	2,310	3,980	892	402
MIN	402	525	398	345	282	328	726	1,500	1,120	956	302	262
AC-FT	63,220	38,230	33,100	24,070	18,330	46,050	54,150	253,100	95,050	121,700	32,810	18,080
CFSM	0.44	0.28	0.23	0.17	0.14	0.32	0.39	1.76	0.68	0.85	0.23	0.13
IN.	0.51	0.31	0.27	0.19	0.15	0.37	0.43	2.03	0.76	0.98	0.26	0.15

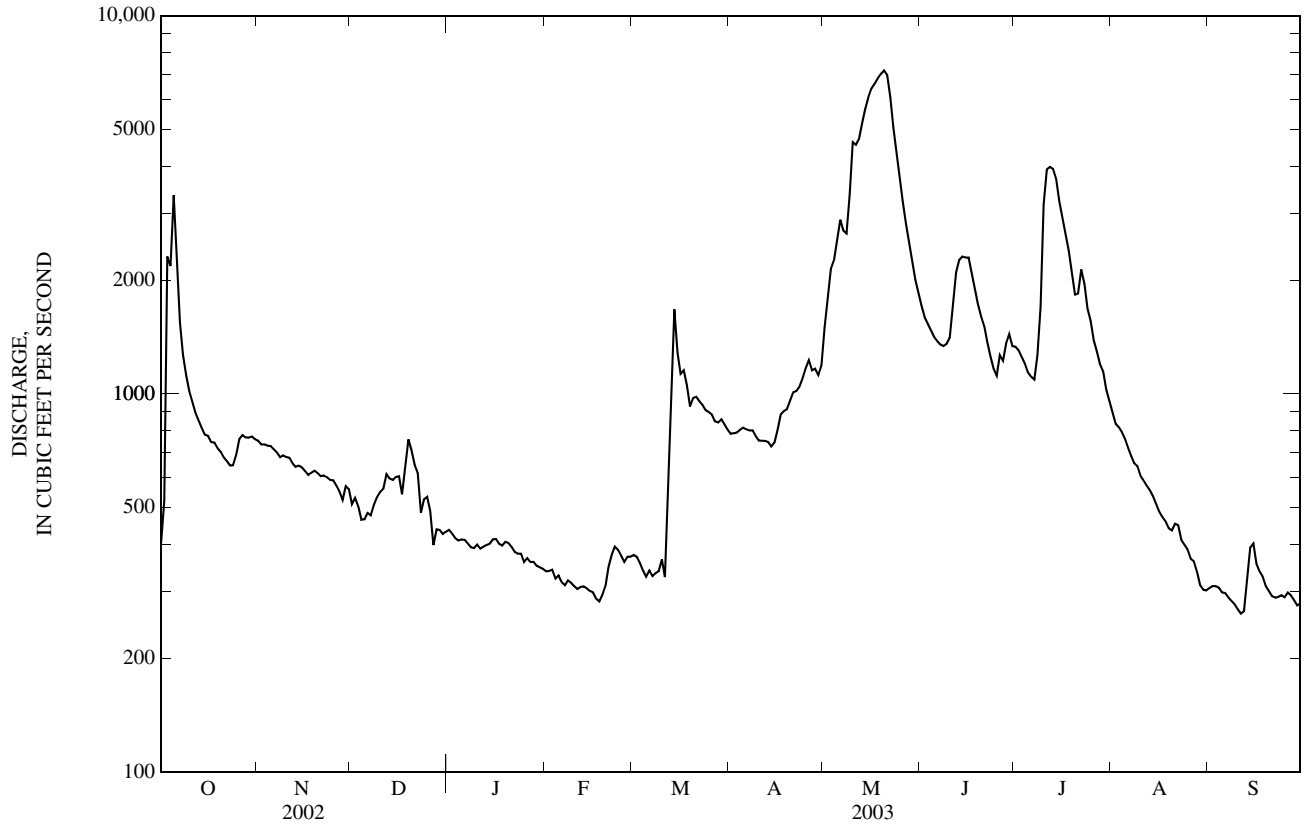
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 2003, BY WATER YEAR (WY)

MEAN	927	1,108	905	817	1,256	2,938	3,009	2,446	2,492	1,792	1,144	1,013
MAX	3,549	6,435	4,945	4,086	3,798	7,137	9,768	6,854	10,950	14,280	8,550	5,647
(WY)	(1973)	(1962)	(1983)	(1946)	(1984)	(1986)	(1993)	(1999)	(1947)	(1993)	(1993)	(1993)
MIN	137	159	104	59.4	104	301	453	323	234	165	103	133
(WY)	(1977)	(1965)	(1977)	(1977)	(1940)	(1954)	(1977)	(1977)	(1977)	(1936)	(1936)	(1976)

05422000 WAPSIPINICON RIVER NEAR DE WITT, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1935 - 2003	
ANNUAL TOTAL	590,416		402,297			
ANNUAL MEAN	1,618		1,102		1,654	
HIGHEST ANNUAL MEAN					5,461	1993
LOWEST ANNUAL MEAN					374	1989
HIGHEST DAILY MEAN	13,800	Jun 8	7,160	May 20	25,400	Apr 22, 1973
LOWEST DAILY MEAN	398	Dec 27	262	Sep 11	46	Jan 22, 1977
ANNUAL SEVEN-DAY MINIMUM	427	Sep 25	278	Sep 6	47	Jan 18, 1977
MAXIMUM PEAK FLOW			7,320	May 20	31,100	Jun 17, 1990
MAXIMUM PEAK STAGE			11.40	May 20	14.19	Jun 17, 1990
INSTANTANEOUS LOW FLOW			253	Sep 11		
ANNUAL RUNOFF (AC-FT)	1,171,000		798,000		1,198,000	
ANNUAL RUNOFF (CFSM)	0.69		0.47		0.71	
ANNUAL RUNOFF (INCHES)	9.40		6.41		9.62	
10 PERCENT EXCEEDS	2,720		2,300		3,940	
50 PERCENT EXCEEDS	1,120		684		918	
90 PERCENT EXCEEDS	533		311		237	

e Estimated



05422470 CROW CREEK AT BETTENDORF, IA

LOCATION.--Lat 41°33'03", long 90°27'15", in NW¼ NW¼ sec.24, T.78 N., R.4 E., Scott County, Hydrologic Unit 07080101, on left bank 200 ft upstream from bridge on Valley Road (old U.S. Highway 67), 3.5 mi east of U.S. Highway 6, and 0.7 mi upstream from mouth.

DRAINAGE AREA.--17.8 mi^2.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 576.23 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	2.5	2.1	e2.1	e2.6	e1.7	3.0	29	5.6	3.3	3.4	2.9
2	35	2.8	2.3	e1.5	e3.0	e1.5	2.8	12	6.0	3.1	3.9	0.84
3	11	2.9	1.9	e1.6	e2.3	e1.4	2.8	9.0	6.3	2.9	2.5	0.51
4	31	3.2	1.9	e1.5	e2.1	e1.8	4.2	46	5.6	2.6	2.3	0.40
5	12	3.4	1.9	e1.4	e1.9	e1.2	5.0	80	5.2	2.3	2.3	0.37
6	7.2	3.4	1.7	e1.3	e1.4	e1.2	2.9	26	8.9	4.0	2.1	0.33
7	5.7	3.3	2.1	e1.6	e1.3	e1.4	4.1	19	7.6	9.0	1.8	0.34
8	4.8	3.2	1.9	e1.8	e1.4	e1.4	4.4	17	6.8	55	1.6	0.31
9	4.1	3.4	1.7	e1.7	e1.3	e1.3	3.5	40	7.7	25	1.8	0.39
10	3.8	3.4	2.0	e1.2	e1.2	e1.3	3.2	42	11	127	1.4	0.29
11	3.7	3.3	2.7	e1.3	e1.4	e2.0	3.1	56	6.8	22	2.8	0.28
12	3.7	3.1	2.7	e1.7	e1.4	e7.6	2.8	22	5.8	15	4.8	0.87
13	3.4	3.0	2.7	e1.4	e1.4	e9.9	2.2	17	5.5	12	2.4	38
14	3.5	4.0	2.6	e1.4	e1.5	e7.4	2.1	31	4.8	10	1.9	57
15	3.5	3.3	2.5	e1.2	e1.8	e5.3	2.0	25	4.3	9.4	1.6	7.6
16	3.1	3.0	2.4	e1.7	e1.7	5.2	3.4	16	3.5	8.2	1.2	3.1
17	3.4	3.0	2.4	e1.9	e1.2	4.9	9.4	14	3.3	7.5	1.1	1.7
18	3.5	3.4	19	e1.7	e2.1	3.6	3.8	13	4.2	6.9	0.84	1.4
19	3.4	2.3	11	e1.7	e3.1	4.0	3.6	12	3.4	6.0	0.63	1.8
20	2.6	3.3	4.6	e1.9	e3.5	5.2	14	10	2.9	5.5	0.87	1.5
21	2.3	2.6	3.1	e1.6	e3.9	3.3	6.5	9.8	3.0	34	5.6	2.3
22	2.3	2.7	2.4	e1.7	e3.9	2.4	4.8	9.4	2.9	7.9	1.3	3.2
23	2.0	2.5	e1.9	e1.5	e2.4	2.2	4.1	9.3	2.7	6.5	0.66	1.3
24	3.0	2.3	2.2	e1.2	e2.0	2.1	3.8	8.7	2.4	5.8	0.55	1.2
25	9.6	2.4	2.0	e2.1	e1.4	2.5	3.7	8.3	10	5.4	0.46	0.89
26	4.9	2.2	1.9	e2.4	e1.8	2.2	3.1	7.6	17	4.4	0.44	0.88
27	2.6	2.2	1.9	e1.9	e1.9	2.2	2.9	6.9	5.8	5.0	0.40	1.1
28	2.4	2.3	2.2	e2.1	e2.0	10	3.0	6.9	4.5	6.5	0.38	1.1
29	2.4	3.1	2.0	e1.9	---	6.2	2.9	5.9	4.1	5.1	0.41	1.00
30	2.4	2.3	2.3	e2.1	---	3.6	26	6.4	3.7	4.0	0.50	0.85
31	2.2	---	2.0	e2.3	---	3.0	---	6.0	---	3.5	0.84	---
TOTAL	188.6	87.8	96.0	52.4	56.9	109.0	143.1	621.2	171.3	424.8	52.78	133.75
MEAN	6.08	2.93	3.10	1.69	2.03	3.52	4.77	20.0	5.71	13.7	1.70	4.46
MAX	35	4.0	19	2.4	3.9	10	26	80	17	127	5.6	57
MIN	2.0	2.2	1.7	1.2	1.2	1.2	2.0	5.9	2.4	2.3	0.38	0.28
AC-FT	374	174	190	104	113	216	284	1,230	340	843	105	265
CFSM	0.34	0.16	0.17	0.09	0.11	0.20	0.27	1.13	0.32	0.77	0.10	0.25
IN.	0.39	0.18	0.20	0.11	0.12	0.23	0.30	1.30	0.36	0.89	0.11	0.28

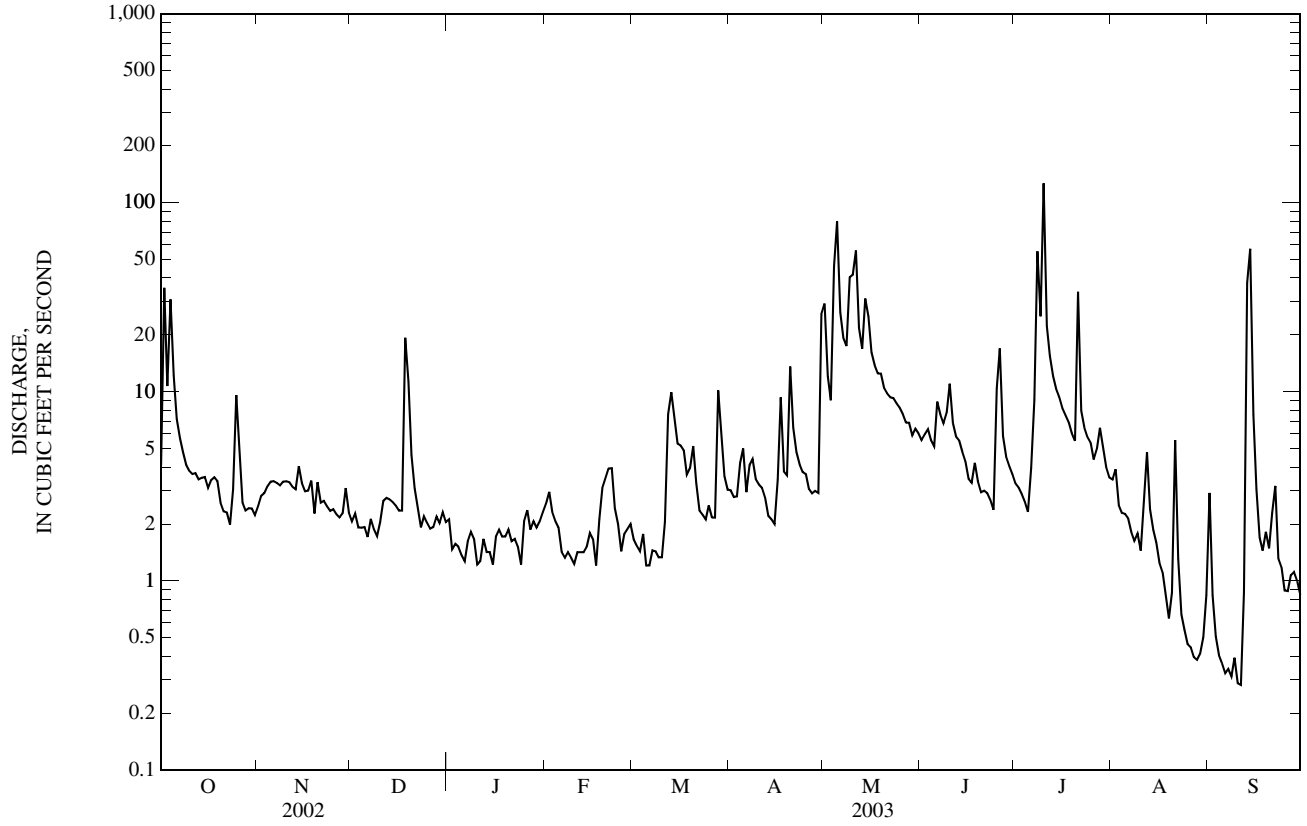
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	10.2	11.1	11.3	7.30	13.6	20.8	21.1	24.9	27.7	14.4	14.2	6.93
MAX	50.9	45.4	44.1	25.0	42.1	54.6	61.3	111	157	65.4	99.8	34.7
(WY)	(1982)	(1993)	(1983)	(1988)	(1985)	(1979)	(1983)	(1996)	(1990)	(1992)	(1990)	(1992)
MIN	0.67	1.19	0.77	1.09	0.76	3.45	2.33	1.68	3.17	0.74	0.85	0.49
(WY)	(1989)	(1990)	(1990)	(2000)	(1989)	(1989)	(1989)	(1989)	(1988)	(1988)	(1978)	(1988)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1978 - 2003	
ANNUAL TOTAL	5,284.41		2,137.63			
ANNUAL MEAN	14.5		5.86		15.3	
HIGHEST ANNUAL MEAN					31.7	1990
LOWEST ANNUAL MEAN					3.35	1989
HIGHEST DAILY MEAN	825	Jun 4	127	Jul 10	1,660	Jun 16, 1990
LOWEST DAILY MEAN	0.21	Feb 5	0.28	Sep 11	0.13	Aug 16, 1988
ANNUAL SEVEN-DAY MINIMUM	0.89	Jan 30	0.33	Sep 5	0.21	Aug 13, 1988
MAXIMUM PEAK FLOW			607	Jul 10	7,700	Jun 16, 1990
MAXIMUM PEAK STAGE			5.99	Jul 10	11.03	Jun 16, 1990
INSTANTANEOUS LOW FLOW			0.24	Sep 11a		
ANNUAL RUNOFF (AC-FT)	10,480		4,240		11,070	
ANNUAL RUNOFF (CFSM)	0.81		0.33		0.86	
ANNUAL RUNOFF (INCHES)	11.04		4.47		11.67	
10 PERCENT EXCEEDS	30		11		32	
50 PERCENT EXCEEDS	4.8		2.9		7.0	
90 PERCENT EXCEEDS	1.9		1.2		1.4	

05422470 CROW CREEK AT BETTENDORF, IA—Continued

a Also Sept. 12.
e Estimated.



05422560 DUCK CREEK AT 110th AVENUE, DAVENPORT, IA

LOCATION.--Lat 41°33'24", long 90°41'15", in NW¼ SW¼, sec.13, T.78 N., R.2 E., Scott County, Hydrologic Unit 07080101, on left bank 20 ft. downstream from the bridge on County Road Y48 (110th Street), 0.3 miles downstream from unnamed creek, 3 miles west of Davenport, and 13.95 miles from the mouth.

DRAINAGE AREA.--16.1 mi^2.

PERIOD OF RECORD.--March 1994 to current year.

GAGE.--Water stage recorder. Datum of gage is 659.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharge, which is poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.9	e1.4	e3.3	e3.3	e1.7	e2.7	16	8.7	4.4	2.2	0.52
2	3.4	1.9	e1.6	e3.1	e3.5	e1.7	e2.7	12	8.1	4.4	2.2	0.34
3	2.2	2.0	e1.5	e3.2	e3.3	e1.6	2.6	10	7.7	4.3	2.1	0.38
4	4.6	2.0	e1.5	e3.2	e2.8	e1.6	2.9	13	7.2	4.0	2.0	0.30
5	3.1	2.0	e1.5	e3.2	e2.4	e1.9	2.8	60	6.9	3.8	2.1	0.21
6	2.4	2.0	e1.4	e2.9	e2.3	e1.6	2.6	32	6.9	4.3	1.7	0.19
7	2.1	1.9	e1.6	e3.0	e2.3	e1.4	e2.6	24	6.9	3.9	1.6	0.27
8	2.0	2.1	e1.5	e3.1	e2.5	e1.6	e2.5	19	6.9	5.8	1.4	0.22
9	2.0	2.0	e1.5	e2.9	e2.5	e1.5	e2.5	33	6.6	7.8	1.2	0.17
10	2.0	1.9	1.8	e2.6	e2.4	e1.8	e2.5	29	7.7	6.4	1.1	0.17
11	2.0	1.8	1.8	e2.6	e2.6	e2.2	e2.5	57	7.9	5.2	1.1	0.19
12	2.0	1.7	1.8	e2.7	e2.4	e8.9	e2.4	32	7.5	5.2	1.1	0.21
13	2.0	1.8	1.6	e2.7	e2.5	e9.9	e2.4	27	7.3	4.4	1.1	1.5
14	1.9	1.8	1.6	e2.7	e2.7	e5.4	2.4	57	6.7	4.0	0.93	2.0
15	1.9	1.7	1.6	e2.6	e2.5	3.9	2.3	45	6.2	3.9	0.86	0.55
16	1.8	1.8	1.5	e2.9	e2.2	3.9	2.6	32	5.9	3.5	0.75	0.16
17	1.9	1.7	1.4	e3.3	e2.1	3.3	3.6	26	5.6	3.4	0.70	0.11
18	1.9	1.7	36	e3.0	e2.5	2.8	3.2	22	5.3	3.3	0.59	0.10
19	1.8	1.8	16	e2.9	e2.6	2.6	3.9	20	5.1	3.1	0.45	0.16
20	1.8	1.7	9.2	e3.1	e3.8	2.6	7.1	17	4.9	3.0	0.53	0.12
21	1.8	1.8	6.9	e2.9	e3.2	2.3	6.6	15	4.6	19	0.75	0.14
22	1.8	1.6	5.7	e2.8	e2.4	2.2	6.0	14	4.3	4.5	0.48	0.20
23	1.8	1.6	e4.2	e2.7	e2.0	2.4	5.5	13	4.0	3.7	0.41	0.18
24	2.0	1.6	e4.5	e2.5	e1.7	2.7	5.4	13	3.6	3.1	0.37	0.16
25	2.9	1.6	e4.4	e2.9	e1.9	2.7	5.2	12	4.5	2.9	0.34	0.16
26	2.3	1.5	e3.7	e3.2	e2.2	2.6	4.9	12	6.4	2.7	0.33	0.19
27	2.0	1.5	e3.8	e2.8	e2.2	e2.5	4.7	11	5.1	3.1	0.31	0.21
28	2.0	1.5	e3.9	e2.9	e2.0	e3.3	4.7	10	e4.9	3.3	0.25	0.20
29	2.1	1.8	e3.7	e2.9	---	3.0	4.6	9.9	e4.7	3.0	0.26	0.19
30	2.1	e1.5	e3.8	e3.1	---	2.7	6.8	9.6	e4.5	2.5	0.24	0.19
31	2.0	---	e3.2	e3.3	---	2.7	---	9.1	---	2.3	0.35	---
TOTAL	67.3	53.2	135.6	91.0	70.8	91.0	113.2	711.6	182.6	138.2	29.80	9.69
MEAN	2.17	1.77	4.37	2.94	2.53	2.94	3.77	23.0	6.09	4.46	0.96	0.32
MAX	4.6	2.1	36	3.3	3.8	9.9	7.1	60	8.7	19	2.2	2.0
MIN	1.7	1.5	1.4	2.5	1.7	1.4	2.3	9.1	3.6	2.3	0.24	0.10
AC-FT	133	106	269	180	140	180	225	1,410	362	274	59	19
CFSM	0.13	0.11	0.27	0.18	0.16	0.18	0.23	1.43	0.38	0.28	0.06	0.02
IN.	0.16	0.12	0.31	0.21	0.16	0.21	0.26	1.64	0.42	0.32	0.07	0.02

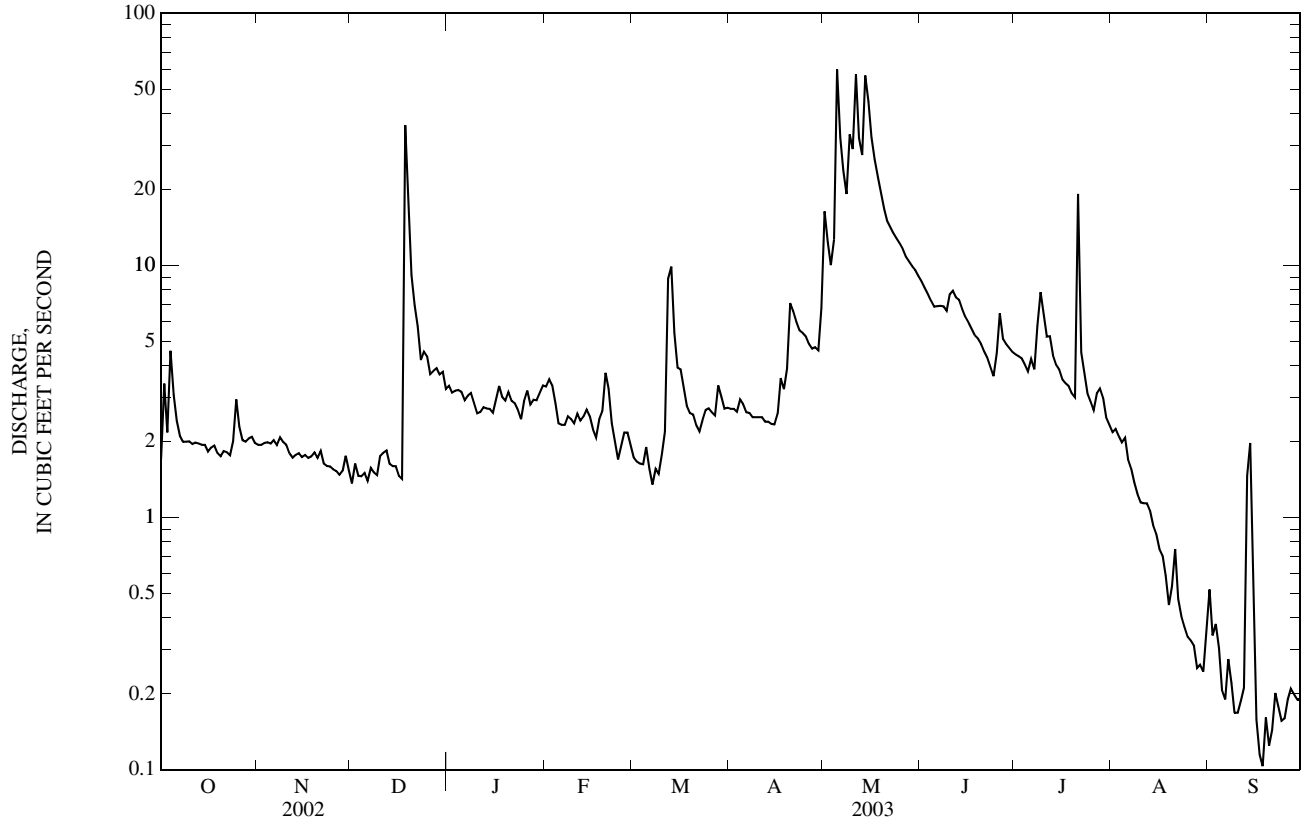
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2003, BY WATER YEAR (WY)

MEAN	7.32	4.64	3.24	3.74	16.1	14.1	20.4	34.4	26.3	9.76	3.81	2.25
MAX	38.0	23.2	10.1	10.8	45.1	50.1	39.4	68.8	44.2	23.3	14.5	8.53
(WY)	(1999)	(1999)	(1999)	(1999)	(2001)	(1998)	(1998)	(1996)	(2000)	(2002)	(2002)	(1998)
MIN	0.30	0.97	0.74	0.73	2.53	2.94	2.60	14.0	6.09	3.03	0.96	0.32
(WY)	(1995)	(1995)	(1997)	(1997)	(2003)	(2003)	(1996)	(1997)	(2003)	(1997)	(2003)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1995 - 2003
ANNUAL TOTAL	5,000.52	1,693.99	
ANNUAL MEAN	13.7	4.64	12.1
HIGHEST ANNUAL MEAN			17.5 1998
LOWEST ANNUAL MEAN			4.64 2003
HIGHEST DAILY MEAN	454 Jun 4	60 May 5	648 May 28, 1996
LOWEST DAILY MEAN	0.92 Feb 5	0.10 Sep 18	0.10 Sep 18, 2003
ANNUAL SEVEN-DAY MINIMUM	1.5 Nov 30	0.14 Sep 16	0.14 Sep 16, 2003
MAXIMUM PEAK FLOW		156 Dec 18	1,870 May 28, 1996
MAXIMUM PEAK STAGE		8.00 Dec 18	18.44 May 28, 1996
ANNUAL RUNOFF (AC-FT)	9,920	3,360	8,790
ANNUAL RUNOFF (CFSM)	0.85	0.29	0.75
ANNUAL RUNOFF (INCHES)	11.55	3.91	10.24
10 PERCENT EXCEEDS	31	9.0	28
50 PERCENT EXCEEDS	4.6	2.6	3.9
90 PERCENT EXCEEDS	1.7	0.47	0.88

05422560 DUCK CREEK AT 110th AVENUE, DAVENPORT, IA—Continued

e Estimated



05422600 DUCK CREEK AT DUCK CREEK GOLF COURSE, DAVENPORT, IA

LOCATION.--Lat 41°32'46", long 90°31'26", in SW¼ SE¼, NW¼, sec.20, T.78 N., R.4 E., Scott County, Hydrologic Unit 07080101, on right bank 500 feet upstream from Kimberly Road, 100 feet upstream of golf cart bridge, 0.5 miles downstream from Pheasant Creek, in Davenport, and 4.45 miles from the mouth.

DRAINAGE AREA.--53.0 mi^2.

PERIOD OF RECORD.--November 1993 to current year.

GAGE.--Water stage recorder. Datum of gage is 597.00 ft above NGVD of 1929.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	5.0	e5.3	e8.1	e4.7	e4.8	7.1	117	23	9.3	12	15
2	128	5.2	e5.6	e7.0	e5.3	e4.0	6.7	41	24	9.2	8.5	4.2
3	14	5.5	e5.4	e7.3	e4.8	e4.5	7.2	32	e22	9.3	6.5	2.6
4	129	5.5	e5.3	e7.2	e4.4	e5.3	27	292	e21	8.9	5.9	1.6
5	19	5.6	e5.4	e7.0	e4.2	e6.6	12	312	20	7.8	5.6	1.3
6	12	5.6	e5.2	e6.7	e4.0	e6.9	7.2	97	66	11	5.4	0.98
7	8.0	5.4	e5.6	e6.8	e4.0	e6.7	21	70	26	e25	5.2	0.60
8	6.3	5.5	e5.4	e6.9	e4.4	e6.3	12	67	37	e231	4.6	0.54
9	5.9	6.0	e5.3	e6.5	e4.3	e5.4	9.0	145	23	e79	4.3	0.50
10	5.7	6.0	5.8	e5.5	e4.2	e5.8	8.3	190	57	531	3.9	e0.54
11	6.2	6.7	6.3	e5.5	e4.6	e7.5	e7.6	263	21	42	35	0.45
12	5.8	6.1	e6.8	e5.6	e4.5	e34	e7.1	91	19	30	e15	e1.4
13	5.4	6.0	e6.9	e5.5	e4.7	e37	6.8	69	17	22	e7.6	e131
14	5.2	6.4	e6.8	e5.4	e4.9	e31	6.4	280	16	19	e3.7	170
15	5.6	e6.2	e6.7	e5.2	e4.9	e26	6.4	150	14	17	3.6	11
16	5.8	e6.3	e6.7	e5.5	e4.6	e20	35	87	13	15	3.7	5.3
17	6.0	e6.2	6.8	e5.8	e4.4	e14	37	69	13	14	2.8	3.5
18	6.2	7.2	139	e5.4	e5.3	13	11	58	37	13	2.2	2.6
19	5.2	9.7	49	e5.1	e9.0	22	17	53	14	11	2.0	6.4
20	5.0	6.1	23	e5.2	e11	16	74	45	12	10	9.3	2.8
21	5.4	8.4	17	e4.7	e9.9	10	19	40	11	317	14	8.9
22	6.0	6.6	14	e4.4	e7.9	8.5	16	38	11	24	5.2	9.1
23	5.3	5.9	e7.8	e4.0	e4.0	7.5	13	36	11	16	3.3	3.1
24	12	5.8	e9.2	e3.7	e3.5	7.4	12	34	10	13	2.3	2.2
25	51	e5.7	e8.6	e4.2	e5.1	8.8	12	32	e97	11	1.7	1.3
26	9.7	e5.6	e8.0	e4.6	e5.7	6.5	11	29	e157	9.7	e1.8	1.0
27	6.2	e5.5	e8.1	e3.7	e6.3	6.1	12	28	14	16	e2.0	1.2
28	5.7	e5.5	e8.3	e4.1	e4.8	58	15	30	12	15	2.0	0.97
29	6.2	e6.0	e8.0	e4.0	---	13	13	26	11	12	1.9	0.92
30	6.3	e5.5	e8.3	e4.4	---	8.4	127	29	10	8.9	2.5	0.92
31	5.3	---	e7.8	e4.5	---	7.3	---	25	---	7.6	15	---
TOTAL	510.9	182.7	417.4	169.5	149.4	418.3	575.8	2,875	839	1,564.7	198.5	391.92
MEAN	16.5	6.09	13.5	5.47	5.34	13.5	19.2	92.7	28.0	50.5	6.40	13.1
MAX	129	9.7	139	8.1	11	58	127	312	157	531	35	170
MIN	5.0	5.0	5.2	3.7	3.5	4.0	6.4	25	10	7.6	1.7	0.45
AC-FT	1,010	362	828	336	296	830	1,140	5,700	1,660	3,100	394	777
CFSM	0.31	0.11	0.25	0.10	0.10	0.25	0.36	1.75	0.53	0.95	0.12	0.25
IN.	0.36	0.13	0.29	0.12	0.10	0.29	0.40	2.02	0.59	1.10	0.14	0.28

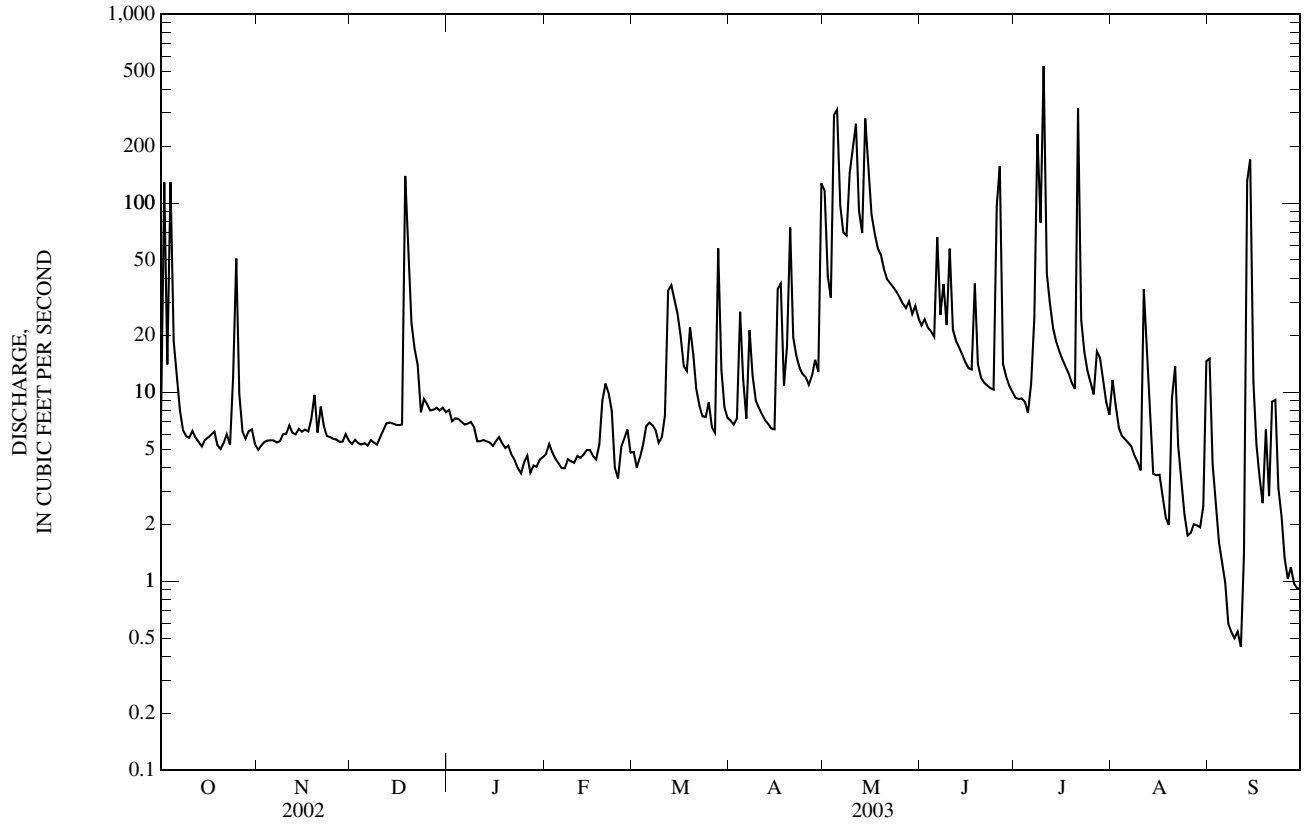
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2003, BY WATER YEAR (WY)

MEAN	24.6	17.5	11.1	14.6	55.8	49.8	76.7	125	99.6	42.7	22.9	16.6
MAX	125	68.3	33.1	38.6	173	143	141	250	177	100	41.5	35.1
(WY)	(1999)	(1999)	(1999)	(1999)	(2001)	(1998)	(1998)	(1996)	(2000)	(2002)	(2002)	(1998)
MIN	3.26	4.84	3.74	4.59	5.34	13.5	16.5	56.3	28.0	10.4	6.40	4.96
(WY)	(1995)	(2000)	(1997)	(2000)	(2003)	(2003)	(1996)	(1997)	(2003)	(1997)	(2003)	(1995)

05422600 DUCK CREEK AT DUCK CREEK GOLF COURSE, DAVENPORT, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1995 - 2003	
ANNUAL TOTAL	18,967.9		8,293.12			
ANNUAL MEAN	52.0		22.7		46.2	
HIGHEST ANNUAL MEAN					61.8	1998
LOWEST ANNUAL MEAN					22.7	2003
HIGHEST DAILY MEAN	2,910	Jun 4	531	Jul 10	2,910	Jun 4, 2002
LOWEST DAILY MEAN	3.4	Feb 5	0.45	Sep 11	0.45	Sep 11, 2003
ANNUAL SEVEN-DAY MINIMUM	3.9	Sep 24	0.70	Sep 5	0.70	Sep 5, 2003
MAXIMUM PEAK FLOW			2,410	Jul 10	7,310	Jun 4, 2002
MAXIMUM PEAK STAGE			10.38	Jul 10	16.34	Jun 4, 2002
INSTANTANEOUS LOW FLOW			0.33	Sep 11a		
ANNUAL RUNOFF (AC-FT)	37,620		16,450		33,500	
ANNUAL RUNOFF (CFSM)	0.98		0.43		0.87	
ANNUAL RUNOFF (INCHES)	13.31		5.82		11.86	
10 PERCENT EXCEEDS	103		43		100	
50 PERCENT EXCEEDS	19		7.2		16	
90 PERCENT EXCEEDS	5.4		3.7		3.9	

a Also Sept. 12.
e Estimated.



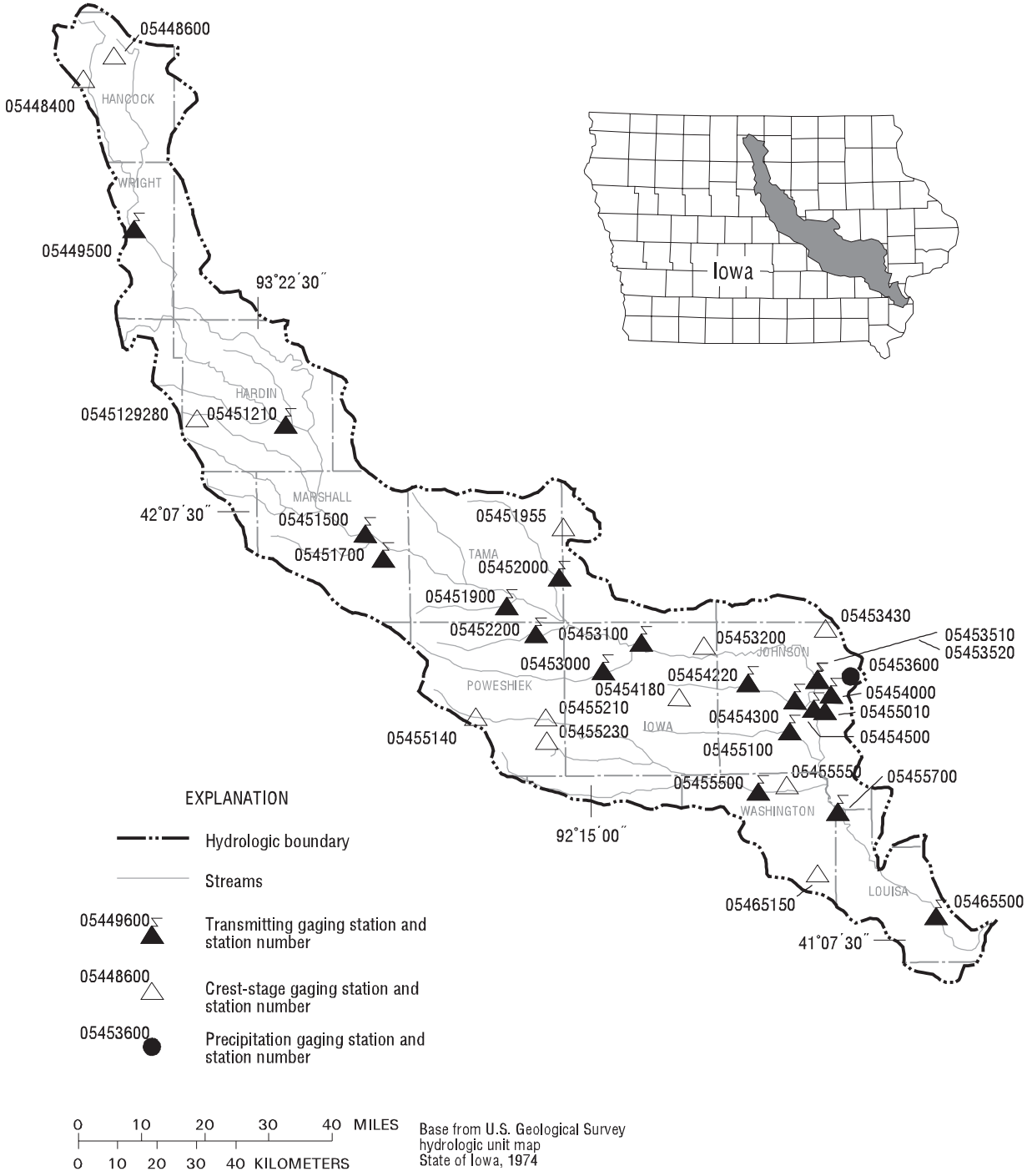


Figure 9. Locations of active continuous-record and crest-stage gaging stations in the Iowa River drainage basins (excluding the Cedar River drainage basin).

Gaging Stations

05449500 Iowa River near Rowan, IA 120
05451210 South Fork Iowa River NE of New Providence, IA 126
05451500 Iowa River at Marshalltown, IA 134
05451700 Timber Creek near Marshalltown, IA 136
05451900 Richland Creek near Haven, IA 138
05452000 Salt Creek near Elberon, IA 140
05452200 Walnut Creek near Hartwick, IA 142
05453000 Big Bear Creek at Ladora, IA 144
05453100 Iowa River at Marengo, IA 146
05453510 Coralville Lake near Coralville, IA 148
05453520 Iowa River below Coralville Dam near Coralville, IA 150
05453600 Rapid Creek below Morse, IA (precipitation) 152
05454000 Rapid Creek near Iowa City, IA 154
05454220 Clear Creek near Oxford, IA 156
05454300 Clear Creek near Coralville, IA 158
05454500 Iowa River at Iowa City, IA 160
05455010 South Branch Ralston Creek at Iowa City, IA 162
05455100 Old Mans Creek near Iowa City, IA 164
05455500 English River at Kalona, IA 166
05455700 Iowa River near Lone Tree, IA 168
(Cedar River Basin Stations . . . . . (170-203)
05465500 Iowa River at Wapello, IA 204

Crest Stage Gaging Stations

05448400 West Main Drainage Ditch 1 & 2 at Britt, IA 458
05448600 East Branch Iowa River above Hayfield, IA 458
0545129280 Honey Creek tributary near Radcliffe, IA 458
05451955 Stein Creek near Clutier, IA 458
05453200 Price Creek at Amana, IA 458
05453430 North Fork Tributary to Mill Creek near Solon, IA 458
05454180 Clear Creek Tributary near Williamsburg, IA 458
05455140 North English River near Montezuma, IA 459
05455210 North English River at Guernsey, IA 459
05455230 Deep River at Deep River, IA 459
05455550 Bulgers Run near Riverside, IA 459
05465150 North Fork Long Creek at Ainsworth, IA 460

05449500 IOWA RIVER NEAR ROWAN, IA

LOCATION.--Lat 42°45'36", long 93°37'23", in NW¼ NE¼ sec.25, T.92 N., R.24 W., Wright County, Hydrologic Unit 07080207, on left bank 10 ft downstream from bridge on county highway C38, 0.9 mi downstream from drainage ditch 123, 3.8 mi northwest of Rowan, 10.7 mi downstream from confluence of East and West Branches, and at mile 316.4.

DRAINAGE AREA.--429 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1940 to September 1976, June 1977 to current year.

REVISED RECORDS.--WSP 1308: 1942-43 (M). WSP 1438: Drainage area. WDR IA-80-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,143.35 ft above NGVD of 1929. Prior to Oct. 14, 1948, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corp of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	237	e119	e79	e84	e60	123	287	246	771	104	41
2	85	246	159	e77	e85	e46	117	297	238	541	97	41
3	152	244	e140	e73	e80	e54	114	278	236	431	93	39
4	538	234	e135	e82	e73	e51	118	365	228	379	88	39
5	1,080	224	e127	e71	e71	e37	126	1,150	216	430	86	38
6	1,300	220	e119	e68	e64	e52	126	1,510	216	610	87	38
7	1,390	210	e119	e71	e49	e55	137	1,680	251	589	82	37
8	1,390	206	e111	e76	e57	e39	143	1,650	337	649	76	34
9	1,240	206	e106	e71	e50	e33	155	1,550	562	850	77	32
10	982	198	e122	e65	e51	e41	168	1,510	672	927	74	30
11	728	191	e105	e62	e54	e52	271	1,500	659	931	73	32
12	582	178	e99	e58	e41	e56	358	1,500	600	899	70	48
13	505	174	e100	e57	e47	e57	345	1,440	535	723	66	53
14	450	173	e111	e54	e53	e64	315	1,330	466	540	64	45
15	417	168	e88	e51	e44	e71	296	1,160	399	439	63	39
16	387	160	e92	e61	e38	e81	287	1,010	354	386	61	36
17	360	157	e90	e55	e43	e95	281	891	319	338	58	34
18	342	156	e97	e50	e54	98	282	755	295	302	55	31
19	322	154	e96	e54	e51	75	276	649	270	264	59	34
20	299	149	e85	e64	e59	65	363	576	240	239	58	35
21	286	146	e71	e59	e57	62	498	512	221	249	55	34
22	274	142	e57	e54	e50	58	501	467	206	218	53	34
23	257	139	e59	e48	e47	61	437	448	217	196	50	34
24	253	139	e62	e57	e39	57	382	424	293	179	47	31
25	255	128	e76	e41	e35	58	342	396	569	163	45	31
26	254	108	e68	e27	e41	56	304	368	915	149	48	30
27	245	121	e82	e35	e49	66	271	341	1,150	141	45	26
28	244	138	e80	e53	e58	103	249	320	1,280	130	43	29
29	250	153	e77	e43	---	161	229	304	1,280	120	41	29
30	251	112	e76	e57	---	e162	237	287	1,110	112	41	28
31	246	---	e69	e68	---	138	---	273	---	106	40	---
TOTAL	15,439	5,211	2,997	1,841	1,524	2,164	7,851	25,228	14,580	13,001	1,999	1,062
MEAN	498	174	96.7	59.4	54.4	69.8	262	814	486	419	64.5	35.4
MAX	1,390	246	159	82	85	162	501	1,680	1,280	931	104	53
MIN	75	108	57	27	35	33	114	273	206	106	40	26
AC-FT	30,620	10,340	5,940	3,650	3,020	4,290	15,570	50,040	28,920	25,790	3,970	2,110
CFSM	1.19	0.42	0.23	0.14	0.13	0.17	0.63	1.95	1.16	1.00	0.15	0.08
IN.	1.37	0.46	0.27	0.16	0.14	0.19	0.70	2.25	1.30	1.16	0.18	0.09

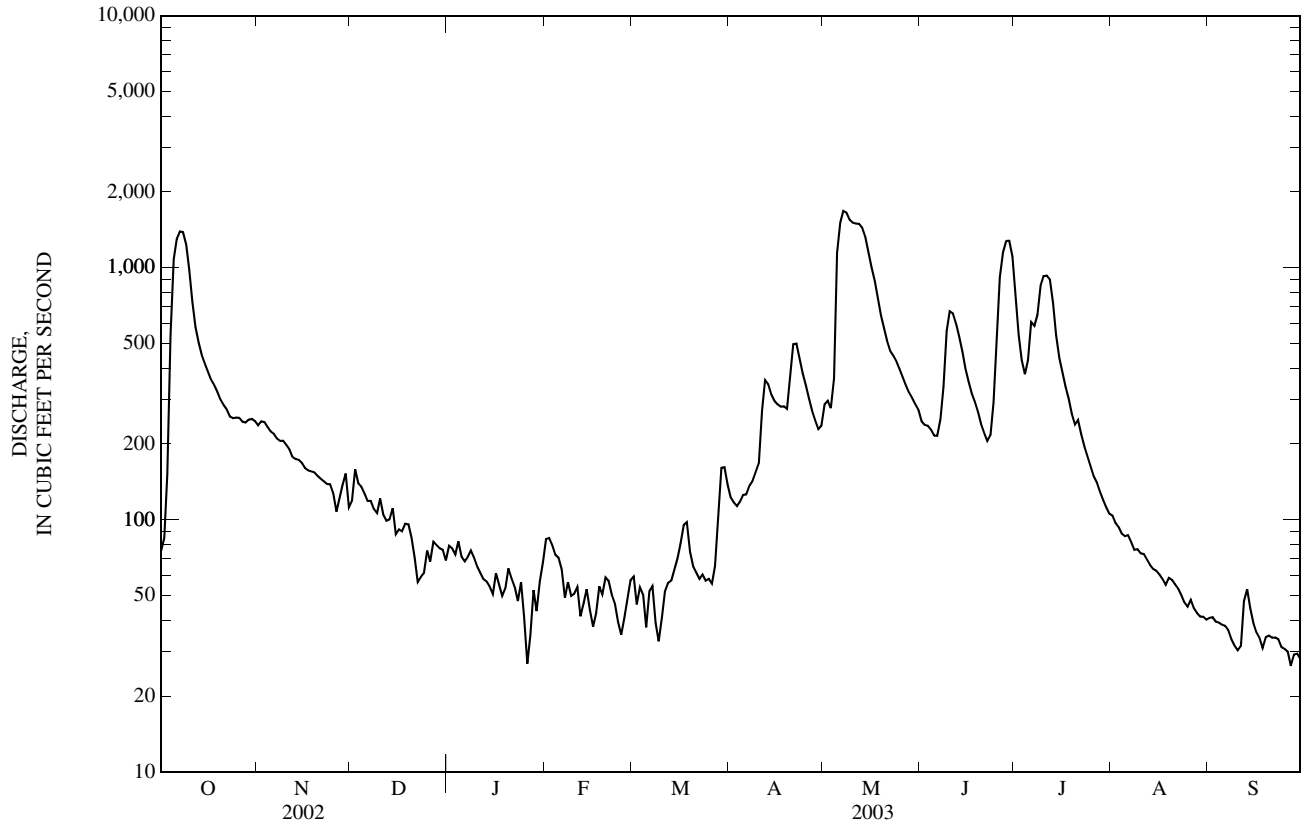
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	138	133	87.1	55.8	113	387	495	386	492	308	165	138
MAX	720	695	588	298	931	1,415	2,439	1,793	2,452	1,922	1,684	1,213
(WY)	(1987)	(1993)	(1983)	(1983)	(1984)	(1973)	(1965)	(1991)	(1984)	(1993)	(1979)	(1965)
MIN	8.14	9.49	5.62	3.63	3.54	23.9	32.4	44.3	19.2	5.36	5.14	3.98
(WY)	(1990)	(1990)	(1990)	(1959)	(1959)	(1968)	(1957)	(1989)	(1989)	(1977)	(1977)	(1977)

05449500 IOWA RIVER NEAR ROWAN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	81,791		92,897			
ANNUAL MEAN	224		255		242	
HIGHEST ANNUAL MEAN					869	1993
LOWEST ANNUAL MEAN					30.4	1956
HIGHEST DAILY MEAN	1,390	Oct 7	1,680	May 7	7,640	Jun 21, 1954
LOWEST DAILY MEAN	50	Jan 28	26	Sep 27	2.2	Sep 11, 1977
ANNUAL SEVEN-DAY MINIMUM	62	Jul 4	29	Sep 24	2.9	Sep 8, 1977
MAXIMUM PEAK FLOW			1,720	May 7	8,460	Jun 21, 1954
MAXIMUM PEAK STAGE			10.49	May 7	14.88	Jun 21, 1954
INSTANTANEOUS LOW FLOW			23	Sep 27	2.2	Sep 11, 1977
ANNUAL RUNOFF (AC-FT)	162,200		184,300		175,600	
ANNUAL RUNOFF (CFSM)	0.54		0.61		0.58	
ANNUAL RUNOFF (INCHES)	7.28		8.27		7.88	
10 PERCENT EXCEEDS	453		626		619	
50 PERCENT EXCEEDS	146		119		87	
90 PERCENT EXCEEDS	77		41		18	

e Estimated



05449500 IOWA RIVER NEAR ROWAN, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 2001 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Gage height, feet (00065)	Instantaneous discharge, cfs (00061)	Turbidity, water, unfltrd field, NTU (61028)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf lab, uS/cm 25 degC (90095)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)
OCT													
01...	1356	3.77	74	20	744	6.1	66	8.0	--	667	22.0	18.4	250
NOV													
04...	1455	4.93	234	6.5	736	12.8	100	8.2	--	734	4.0	4.7	247
DEC													
03...	1430	4.75	140	5.7	--	15.7	108	7.8	764	788	--	0.1	290
JAN													
07...	1415	3.96	71	2.9	727	21.4	152	7.8	--	723	15.0	0.7	294
FEB													
03...	1445	4.32	80	4.9	718	6.0	44	7.3	--	694	--	0.2	282
APR													
02...	1425	4.07	117	--	730	14.4	145	8.2	--	669	--	14.2	266
MAY													
05...	1508	9.08	1,250	310	--	9.9	--	7.7	--	450	--	8.4	143
JUN													
03...	1401	4.88	235	20	732	10.5	106	8.3	--	672	--	13.9	249
JUL													
08...	1450	7.18	720	69	735	8.2	95	7.9	596	638	--	20.5	224
AUG													
05...	1412	3.93	87	35	730	8.2	97	8.2	--	644	22.0	21.4	259
11...	1315	3.83	72	21	--	12.3	--	8.1	--	622	--	23.2	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	2,6-Diethylaniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Acetochlor, water, fltrd, ug/L (49260)
OCT													
01...	299	3	18.6	46.9	0.59	<0.04	4.20	0.030	<0.02	0.134	<0.006	E.031	<0.006
NOV													
04...	297	2	18.3	34.7	0.54	<0.04	8.82	0.021	0.05	0.073	--	--	--
DEC													
03...	350	1	19.5	45.4	0.49	E.03	17.6	0.030	0.04	0.067	<0.006	E.027	0.008
JAN													
07...	356	0.0	17.1	45.2	0.42	E.02	5.85	0.024	0.05	0.084	<0.006	E.013	<0.006
FEB													
03...	344	--	19.8	49.3	0.45	0.07	4.79	0.038	0.04	0.077	<0.006	E.015	<0.006
APR													
02...	300	12	20.4	43.0	1.1	0.05	6.41	0.090	0.03	0.123	<0.006	E.023	0.009
MAY													
05...	174	--	11.3	14.0	2.6	<0.04	7.64	0.151	<0.02	0.66	<0.006	E.056	3.50
JUN													
03...	304	--	18.7	35.4	0.88	<0.04	9.93	0.146	--	0.101	<0.006	E.028	0.027
JUL													
08...	273	--	16.2	25.8	1.3	<0.04	11.7	0.050	0.10	0.27	<0.006	E.076	0.027
AUG													
05...	316	--	17.1	53.9	0.88	<0.04	3.22	0.081	E.01	0.156	<0.006	E.015	<0.006
11...	--	--	--	--	--	--	--	--	--	--	--	--	--

05449500 IOWA RIVER NEAR ROWAN, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Ala-chlor, water, fltrd, ug/L (46342)	alpha-HCH, water, fltrd, ug/L (34253)	Atra-zine, water, fltrd, ug/L (39632)	Azin-phos-methyl, water, fltrd 0.7u GF ug/L (82686)	Ben-flur-alin, water, fltrd 0.7u GF ug/L (82673)	Butyl-ate, water, fltrd, ug/L (04028)	Car-baryl, water, fltrd 0.7u GF ug/L (82680)	Carbo-furan, water, fltrd 0.7u GF ug/L (82674)	Chlor-pyrifos water, fltrd, ug/L (38933)	cis-Per-methrin water fltrd 0.7u GF ug/L (82687)	Cyana-zine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Diazi-non, water, fltrd, ug/L (39572)
OCT													
01...	<0.004	<0.005	0.045	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
NOV													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
03...	<0.004	<0.005	0.029	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
JAN													
07...	<0.004	<0.005	0.019	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
FEB													
03...	<0.004	<0.005	0.018	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
APR													
02...	<0.004	<0.005	0.029	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
MAY													
05...	0.009	<0.005	2.81	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
JUN													
03...	E.004	<0.005	0.089	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
JUL													
08...	<0.004	<0.005	0.417	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
AUG													
05...	<0.004	<0.005	0.033	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
11...	--	--	--	--	--	--	--	--	--	--	--	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Diel-drin, water, fltrd, ug/L (39381)	Disul-foton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethal-flur-alin, water, fltrd 0.7u GF ug/L (82663)	Etho-prop, water, fltrd 0.7u GF ug/L (82672)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Mala-thion, water, fltrd, ug/L (39532)	Methyl para-thion, water, fltrd 0.7u GF ug/L (82667)	Metola-chlor, water, fltrd, ug/L (39415)	Metri-buzin, water, fltrd, ug/L (82630)	Moli-nate, water, fltrd 0.7u GF ug/L (82671)
OCT													
01...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.042	0.022	<0.002
NOV													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
03...	<0.005	<0.02	0.003	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.021	<0.006	<0.002
JAN													
07...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	E.004	<0.006	0.022	<0.006	<0.002
FEB													
03...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.021	<0.006	<0.002
APR													
02...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.025	<0.006	<0.002
MAY													
05...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	3.60	<0.006	<0.002
JUN													
03...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.035	<0.006	<0.002
JUL													
08...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.073	<0.006	<0.002
AUG													
05...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.029	<0.006	<0.002
11...	--	--	--	--	--	--	--	--	--	--	--	--	--

05449500 IOWA RIVER NEAR ROWAN, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Napropamide, water, fltrd 0.7u GF ug/L (82684)	p,p-' DDE, water, fltrd, ug/L (34653)	Parathion, water, fltrd, ug/L (39542)	Pebulate, water, fltrd 0.7u GF ug/L (82669)	Pendimethalin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prometon, water, fltrd, ug/L (04037)	Pronamide, water, fltrd 0.7u GF ug/L (82676)	Propachlor, water, fltrd, ug/L (04024)	Propanil, water, fltrd 0.7u GF ug/L (82679)	Propargite, water, fltrd 0.7u GF ug/L (82685)	Tebuthiuron water fltrd 0.7u GF ug/L (82670)	Terbacil, water, fltrd 0.7u GF ug/L (82665)
OCT													
01...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
NOV													
04...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
03...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
JAN													
07...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
FEB													
03...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
APR													
02...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
MAY													
05...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
JUN													
03...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
JUL													
08...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
AUG													
05...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
11...	--	--	--	--	--	--	--	--	--	--	--	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Terbufos, water, fltrd 0.7u GF ug/L (82675)	Thiobencarb water fltrd 0.7u GF ug/L (82681)	Triallate, water, fltrd 0.7u GF ug/L (82678)	Trifluralin, water, fltrd 0.7u GF ug/L (82661)	Suspended sediment concentration mg/L (80154)
OCT					
01...	<0.02	<0.005	<0.002	<0.009	79
NOV					
04...	--	--	--	--	78
DEC					
03...	<0.02	<0.005	<0.002	<0.009	147
JAN					
07...	<0.02	<0.005	<0.002	<0.009	90
FEB					
03...	<0.02	<0.005	<0.002	<0.009	29
APR					
02...	<0.02	<0.005	<0.002	<0.009	28
MAY					
05...	<0.02	<0.005	<0.002	<0.009	340
JUN					
03...	<0.02	<0.005	<0.002	<0.009	31
JUL					
08...	<0.02	<0.005	<0.002	<0.009	85
AUG					
05...	<0.02	<0.005	<0.002	<0.009	113
11...	--	--	--	--	--

THIS PAGE IS INTENTIONALLY BLANK

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA

LOCATION.--Lat 42°18'55", long 93°09'07", in SE¼ NW¼ SW¼ sec.26, T.87 N., R.20 W., Hardin County, Hydrologic Unit 07080207, located 15 ft from the left bank downstream side of the bridge on County Road, 4.0 miles upstream of the confluence with the Iowa River, and 2.0 miles NE of New Providence.

DRAINAGE AREA.--230 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1995 to current year.

GAGE.--Water stage recorder. Datum of gage is 945 ft above NGVD of 1929, from map.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	127	e54	e33	e21	e42	51	514	120	127	51	4.2
2	101	121	e49	e31	e19	e39	52	e490	123	111	44	4.3
3	164	117	e46	e29	e17	e38	51	e413	126	96	38	4.0
4	261	110	e48	e27	e18	e37	55	343	123	81	33	3.8
5	465	101	e47	e26	e19	e35	59	681	118	126	30	3.4
6	478	95	e44	e25	e20	e34	57	970	124	224	29	3.2
7	326	89	e48	e26	e19	e35	61	908	e145	199	26	2.8
8	248	86	e45	e29	e19	e35	64	696	e170	198	24	2.8
9	211	87	e46	e25	e19	e36	67	833	196	831	22	2.5
10	184	84	e52	e20	e19	e36	69	854	245	1,330	21	2.5
11	168	80	e51	e23	e19	e40	114	667	251	1,230	19	2.3
12	155	73	e57	e24	e20	e54	189	518	234	785	17	5.7
13	140	70	e54	e24	e18	e110	170	427	209	521	16	6.1
14	128	73	e58	e23	e19	e144	149	403	183	e390	15	5.5
15	126	73	e59	e20	e22	e165	130	427	164	e308	14	4.0
16	119	69	e53	e21	e20	e138	124	387	149	249	13	3.4
17	111	67	e55	e22	e22	e69	112	329	137	212	11	2.7
18	107	68	e63	e21	e26	e61	105	293	127	194	10	2.7
19	101	67	e54	e20	e28	e50	121	266	113	171	9.8	3.3
20	92	64	e46	e20	e36	e40	323	239	99	149	9.4	2.6
21	89	62	e43	e20	e43	e30	430	219	e88	159	8.1	3.7
22	87	61	e37	e23	e43	e27	339	207	e85	182	7.2	7.3
23	82	59	e28	e19	e41	e27	272	203	75	156	7.1	5.5
24	83	61	e34	e19	e42	e27	236	189	69	135	6.6	3.9
25	86	e55	e37	e19	e43	25	211	179	110	118	6.2	3.2
26	92	e49	e38	e17	e43	24	190	169	224	105	5.7	2.6
27	97	e38	e31	e16	e43	27	174	159	244	90	5.3	3.0
28	98	e46	e36	e17	e42	30	161	153	211	e80	4.7	2.5
29	108	e53	e40	e18	---	36	148	145	180	e72	4.5	e2.2
30	136	e48	e39	e19	---	50	216	142	148	66	e4.4	2.3
31	137	---	e31	e20	---	51	---	132	---	59	4.2	---
TOTAL	4,867	2,253	1,423	696	760	1,592	4,500	12,555	4,590	8,754	516.2	108.0
MEAN	157	75.1	45.9	22.5	27.1	51.4	150	405	153	282	16.7	3.60
MAX	478	127	63	33	43	165	430	970	251	1,330	51	7.3
MIN	82	38	28	16	17	24	51	132	69	59	4.2	2.2
AC-FT	9,650	4,470	2,820	1,380	1,510	3,160	8,930	24,900	9,100	17,360	1,020	214
CFSM	0.70	0.34	0.20	0.10	0.12	0.23	0.67	1.81	0.68	1.26	0.07	0.02
IN.	0.81	0.37	0.24	0.12	0.13	0.26	0.75	2.09	0.76	1.45	0.09	0.02

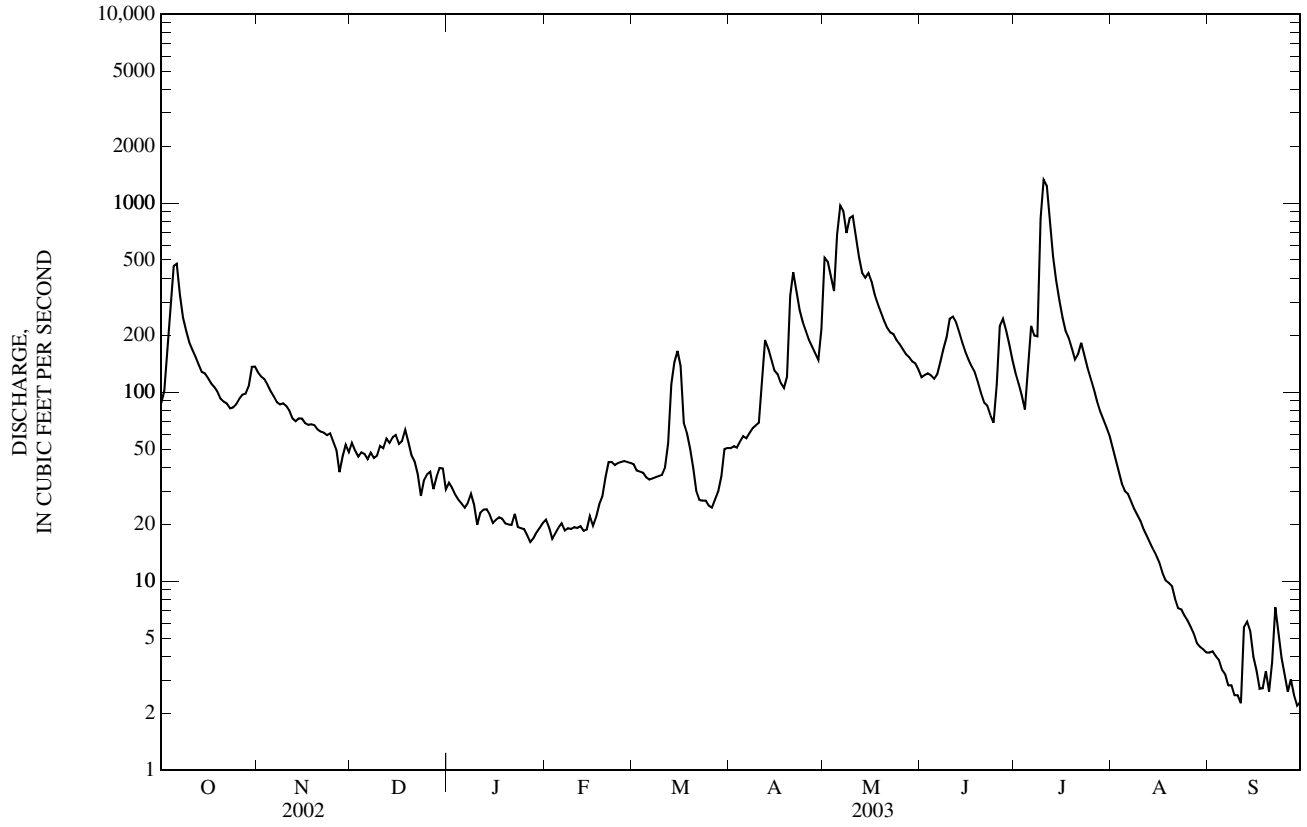
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2003, BY WATER YEAR (WY)

MEAN	45.3	58.7	40.3	26.5	97.2	154	211	329	432	181	43.7	22.0
MAX	157	199	119	65.7	250	386	513	643	1,173	414	161	79.4
(WY)	(2003)	(1997)	(1997)	(1997)	(1997)	(2001)	(1999)	(1999)	(1998)	(1998)	(2002)	(2002)
MIN	2.59	4.90	5.03	4.63	7.51	8.73	7.17	13.1	153	59.9	12.5	3.51
(WY)	(2000)	(2000)	(2000)	(2001)	(2001)	(2000)	(2000)	(2000)	(2003)	(1996)	(2000)	(2000)

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1996 - 2003	
ANNUAL TOTAL	45,085		42,614.2			
ANNUAL MEAN	124		117		145	
HIGHEST ANNUAL MEAN					218	1998
LOWEST ANNUAL MEAN					36.6	2000
HIGHEST DAILY MEAN	1,460	May 12	1,330	Jul 10	2,920	Jun 30, 1998
LOWEST DAILY MEAN	12	Sep 9	2.2	Sep 29	1.7	Sep 13, 2000
ANNUAL SEVEN-DAY MINIMUM	17	Sep 6	2.8	Sep 5	1.9	Sep 11, 2000
MAXIMUM PEAK FLOW			1,430	Jul 10	3,550	Jun 21, 1998
MAXIMUM PEAK STAGE			8.00	Jul 10	11.59	Jun 21, 1998
INSTANTANEOUS LOW FLOW					1.7	Sep 26, 1999a
ANNUAL RUNOFF (AC-FT)	89,430		84,530		105,100	
ANNUAL RUNOFF (CFSM)	0.55		0.52		0.65	
ANNUAL RUNOFF (INCHES)	7.49		7.08		8.80	
10 PERCENT EXCEEDS	256		248		381	
50 PERCENT EXCEEDS	69		57		52	
90 PERCENT EXCEEDS	36		6.4		5.0	

a Also Oct. 3, 2000.
e Estimated.



05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1995 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Gage height, feet (00065)	Instantaneous discharge, cfs (00061)	Turbidity, water, unfltrd field, NTU (61028)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf lab, uS/cm 25 degC (90095)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)
OCT													
02...	0831	3.21	101	18	735	8.9	93	7.8	--	719	15.0	17.4	247
NOV													
05...	0822	3.35	105	3.6	728	13.4	100	7.8	--	805	5.0	3.1	282
DEC													
04...	0830	3.28	48	3.7	741	15.7	108	7.5	851	906	--	0.0	313
JAN													
08...	0836	2.97	28	2.7	724	13.6	93	7.8	706	744	3.0	0.1	285
FEB													
04...	0858	3.36	18	3.7	719	7.1	52	7.2	--	756	--	0.1	294
APR													
03...	0830	2.77	55	--	726	11.2	101	8.2	--	691	--	10.8	254
MAY													
06...	0800	6.91	967	300	725	11.0	100	8.0	--	751	--	8.7	244
JUN													
04...	0823	3.43	129	10	731	9.7	99	8.2	--	709	--	14.5	229
JUL													
09...	0844	6.28	800	140	734	8.2	92	8.1	--	625	22.0	19.1	217
AUG													
06...	0817	2.50	29	11	734	7.7	89	8.1	--	597	--	20.4	219
12...	1200	2.30	13	7.4	--	10.8	--	8.3	--	538	--	26.0	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	2,6-Diethylaniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Acetochlor, water, fltrd, ug/L (49260)
OCT													
02...	296	2	22.2	27.9	0.54	<0.04	14.0	0.029	0.02	0.070	<0.006	E.052	<0.006
NOV													
05...	340	2	23.0	28.3	0.44	<0.04	17.0	0.035	<0.02	0.019	--	--	--
DEC													
04...	378	2	25.5	34.4	0.47	E.03	17.8	0.059	<0.02	0.015	<0.006	E.040	<0.006
JAN													
08...	344	2	22.3	31.6	0.47	0.07	11.7	0.035	<0.02	0.024	<0.006	E.019	<0.006
FEB													
04...	358	--	22.2	35.1	0.69	0.19	11.1	0.067	E.01	0.035	<0.006	E.025	<0.006
APR													
03...	285	12	27.7	33.0	0.65	E.03	10.4	0.144	E.01	0.30	<0.006	E.033	0.011
MAY													
06...	298	--	24.9	24.0	2.2	<0.04	21.1	0.117	0.03	0.49	<0.006	E.037	1.36
JUN													
04...	279	--	23.8	27.1	0.69	<0.04	17.8	0.053	--	0.027	<0.006	E.059	0.199
JUL													
09...	264	--	19.6	17.3	2.7	E.03	16.6	0.040	0.11	0.72	<0.006	E.110	0.254
AUG													
06...	267	--	22.6	35.6	0.66	<0.04	8.02	0.053	<0.02	0.038	<0.006	E.030	<0.006
12...	--	--	--	--	--	--	--	--	--	--	--	--	--

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Ala-chlor, water, fltrd, ug/L (46342)	alpha-HCH, water, fltrd, ug/L (34253)	Atra-zine, water, fltrd, ug/L (39632)	Azin-phos-methyl, water, fltrd 0.7u GF ug/L (82686)	Ben-flur-alin, water, fltrd 0.7u GF ug/L (82673)	Butyl-ate, water, fltrd, ug/L (04028)	Car-baryl, water, fltrd 0.7u GF ug/L (82680)	Carbo-furan, water, fltrd 0.7u GF ug/L (82674)	Chlor-pyrifos water, fltrd, ug/L (38933)	cis-Per-methrin water fltrd 0.7u GF ug/L (82687)	Cyana-zine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Diazi-non, water, fltrd, ug/L (39572)
OCT													
02...	<0.004	<0.005	0.058	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
NOV													
05...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
04...	<0.004	<0.005	0.038	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
JAN													
08...	<0.004	<0.005	0.023	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
FEB													
04...	<0.004	<0.005	0.027	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
APR													
03...	<0.004	<0.005	0.032	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
MAY													
06...	<0.004	<0.005	0.649	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
JUN													
04...	<0.004	<0.005	0.842	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
JUL													
09...	0.011	<0.005	0.784	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	0.075	<0.003	<0.005
AUG													
06...	<0.004	<0.005	0.062	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005
12...	--	--	--	--	--	--	--	--	--	--	--	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Diel-drin, water, fltrd, ug/L (39381)	Disul-foton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethal-flur-alin, water, fltrd 0.7u GF ug/L (82663)	Etho-prop, water, fltrd 0.7u GF ug/L (82672)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Mala-thion, water, fltrd, ug/L (39532)	Methyl para-thion, water, fltrd 0.7u GF ug/L (82667)	Metola-chlor, water, fltrd, ug/L (39415)	Metri-buzin, water, fltrd, ug/L (82630)	Moli-nate, water, fltrd 0.7u GF ug/L (82671)
OCT													
02...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.111	<0.006	<0.002
NOV													
05...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
04...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.056	<0.006	<0.002
JAN													
08...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.044	<0.006	<0.002
FEB													
04...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.030	<0.006	<0.002
APR													
03...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.246	<0.006	<0.002
MAY													
06...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	2.51	<0.006	<0.002
JUN													
04...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.123	<0.006	<0.002
JUL													
09...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.520	0.032	<0.002
AUG													
06...	<0.005	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.045	<0.006	<0.002
12...	--	--	--	--	--	--	--	--	--	--	--	--	--

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Napropamide, water, fltrd 0.7u GF ug/L (82684)	p,p-' DDE, water, fltrd, ug/L (34653)	Parathion, water, fltrd, ug/L (39542)	Pebulate, water, fltrd 0.7u GF ug/L (82669)	Pendimethalin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prometon, water, fltrd, ug/L (04037)	Pronamide, water, fltrd 0.7u GF ug/L (82676)	Propachlor, water, fltrd, ug/L (04024)	Propanil, water, fltrd 0.7u GF ug/L (82679)	Propargite, water, fltrd 0.7u GF ug/L (82685)	Tebuthiuron water fltrd 0.7u GF ug/L (82670)	Terbacil, water, fltrd 0.7u GF ug/L (82665)
OCT													
02...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
NOV													
05...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
04...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
JAN													
08...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
FEB													
04...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
APR													
03...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
MAY													
06...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
JUN													
04...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
JUL													
09...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
AUG													
06...	<0.007	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034
12...	--	--	--	--	--	--	--	--	--	--	--	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Terbufos, water, fltrd 0.7u GF ug/L (82675)	Thiobencarb water fltrd 0.7u GF ug/L (82681)	Triallate, water, fltrd 0.7u GF ug/L (82678)	Trifluralin, water, fltrd 0.7u GF ug/L (82661)	Suspended sediment concentration mg/L (80154)
OCT					
02...	<0.02	<0.005	<0.002	<0.009	122
NOV					
05...	--	--	--	--	97
DEC					
04...	<0.02	<0.005	<0.002	<0.009	41
JAN					
08...	<0.02	<0.005	<0.002	<0.009	23
FEB					
04...	<0.02	<0.005	<0.002	<0.009	50
APR					
03...	<0.02	<0.005	<0.002	<0.009	35
MAY					
06...	<0.02	<0.005	<0.002	<0.009	610
JUN					
04...	<0.02	<0.005	<0.002	<0.009	29
JUL					
09...	<0.02	<0.005	<0.002	<0.009	917
AUG					
06...	<0.02	<0.005	<0.002	<0.009	79
12...	--	--	--	--	--

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA—Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.-- October 1995 to current year.

INSTRUMENTATION.-- Tipping bucket rain gage.

REMARKS.-- Estimated totals Oct. 1, Feb. 8-10, and Aug. 21, 22. Records good except for estimated days and winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.-- Maximum daily accumulation, 5.37 in., June 21, 1997.

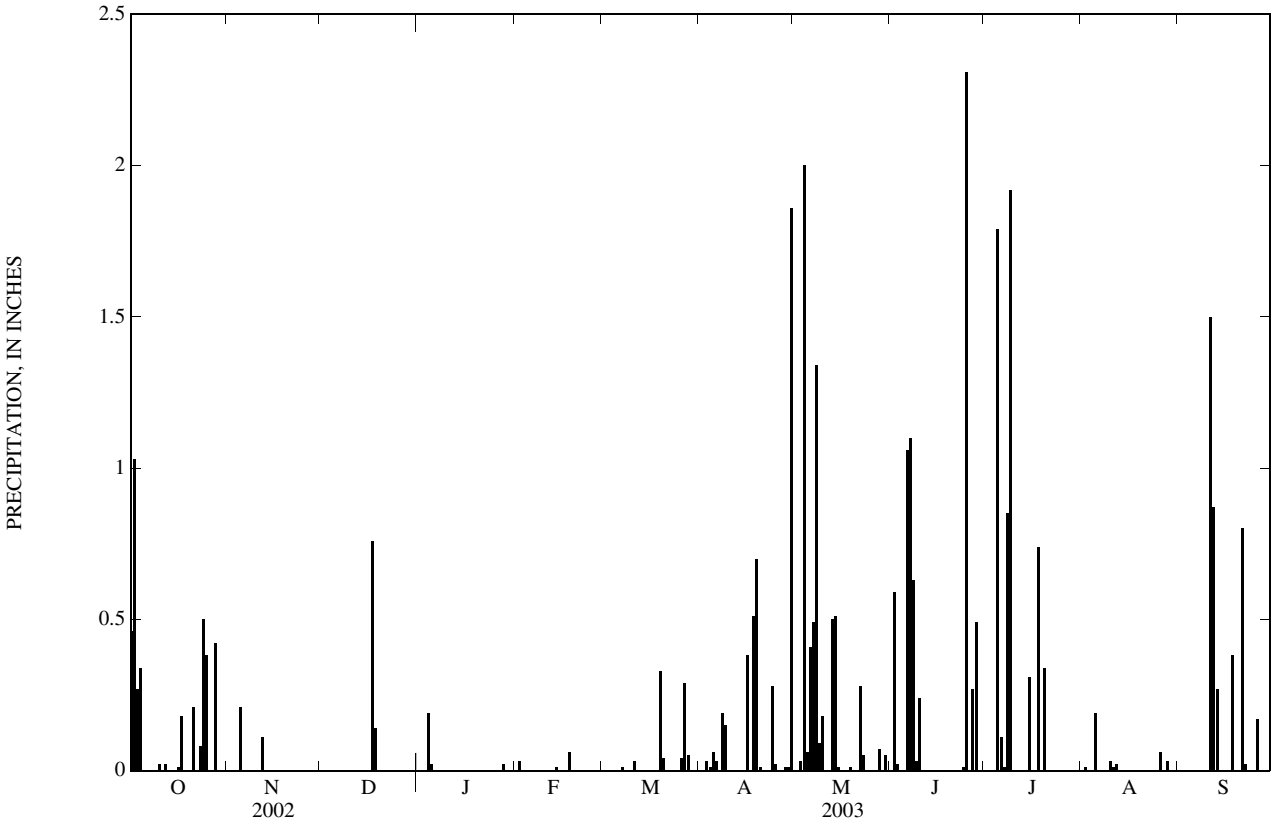
EXTREME FOR CURRENT YEAR.-- Maximum daily accumulation 2.31 in., June 25.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.46	0.00	e0.00	0.00	e0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1.03	0.00	e0.00	0.00	e0.03	0.00	0.00	e0.00	0.59	0.00	0.01	0.00
3	0.27	0.00	0.00	0.00	0.00	0.00	0.03	e0.03	0.02	0.00	0.00	0.00
4	0.34	0.00	0.00	0.19	0.00	0.00	0.01	2.00	0.00	0.00	0.00	0.00
5	0.00	0.21	0.00	0.02	0.00	0.00	0.06	0.06	0.00	1.79	0.19	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.41	1.06	0.11	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.49	e1.10	0.01	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.19	1.34	e0.63	0.85	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.09	0.03	1.92	0.00	0.00
10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.24	0.00	0.03	0.00
11	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01	1.50
12	0.02	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.87
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.27
14	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.51	0.00	e0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	e0.31	0.00	0.00
16	0.01	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00
17	0.18	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.14	e0.00	0.06	0.00	0.51	0.00	0.00	0.74	0.00	0.38
19	0.00	0.00	0.00	e0.00	0.00	0.33	0.70	0.01	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.34	0.00	0.00
21	0.21	0.00	0.00	e0.00	0.00	0.00	0.00	0.00	e0.00	0.00	0.00	0.80
22	0.00	0.00	0.00	e0.00	0.00	0.00	0.00	0.28	e0.00	0.00	e0.00	0.02
23	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	e0.00	0.00
24	0.50	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.01	0.00	0.00	0.00
25	0.38	0.00	e0.00	0.00	0.00	0.00	0.02	0.00	2.31	0.00	0.00	e0.00
26	0.00	0.00	e0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.06	e0.17
27	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.27	0.00	0.00	0.00
28	0.42	0.00	e0.00	0.02	0.00	0.05	0.01	0.07	0.49	e0.00	0.03	0.00
29	0.00	0.00	e0.00	0.00	---	0.00	0.01	0.00	0.00	e0.00	e0.00	e0.00
30	0.00	e0.00	e0.00	e0.00	---	0.00	1.86	0.05	0.00	0.00	e0.00	e0.00
31	0.00	---	0.00	e0.00	---	0.00	---	0.00	---	0.00	e0.00	---
TOTAL	3.92	0.32	0.90	0.23	0.10	0.79	4.25	6.08	6.75	6.07	0.35	4.01
MEAN	0.13	0.01	0.03	0.01	0.00	0.03	0.14	0.20	0.23	0.20	0.01	0.13
MAX	1.03	0.21	0.76	0.19	0.06	0.33	1.86	2.00	2.31	1.92	0.19	1.50
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

e Estimated

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05451500 IOWA RIVER AT MARSHALLTOWN, IA

LOCATION.--Lat 42°03'57", long 92°54'27", in SE¼ SE¼ sec.23, T.84 N., R.18 W., Marshall County, Hydrologic Unit 07080208, on right bank 10 ft downstream from bridge on State Highway 14, 1,500 ft upstream from Burnett Creek, 2.2 mi upstream from Linn Creek, and at mile 222.8.

DRAINAGE AREA.--1,532 mi^2.

PERIOD OF RECORD.--October 1902 to September 1903, October 1914 to September 1927, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1915-18, 1919 (M), 1920, 1921-23 (M), 1924-27, 1933, 1934 (M), 1936, 1938, 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 853.10 ft above NGVD of 1929. See WSP 1728 for history of changes prior to Sept. 21, 1934.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	295	629	e361	e275	e176	e143	383	1,350	1,160	2,050	650	93
2	336	616	e403	e269	e178	e137	397	1,550	1,150	2,040	598	86
3	360	599	e393	e264	e174	e150	409	1,470	1,170	1,950	558	81
4	450	587	e389	e275	e168	e150	411	1,400	1,130	1,690	524	74
5	635	590	e380	e260	e165	e163	422	2,220	1,090	1,870	490	68
6	1,170	577	e369	e254	e162	e150	413	2,920	1,140	2,310	470	63
7	1,370	558	e370	e258	e150	e163	432	3,260	1,280	2,480	442	58
8	1,450	533	e363	e264	e156	e163	459	3,550	1,500	2,410	407	54
9	1,530	526	e360	e249	e150	e163	458	4,770	1,650	3,560	376	50
10	1,610	513	e367	e226	e150	e160	468	5,290	1,750	5,060	344	45
11	1,630	518	e346	e210	e155	e183	509	4,740	1,830	5,230	318	44
12	1,540	503	e332	e192	e142	e276	642	4,110	1,850	5,070	294	184
13	1,330	486	e319	e184	e147	e588	758	3,510	1,840	4,250	271	141
14	1,080	471	e315	e177	e153	e833	784	3,610	1,770	3,400	256	93
15	915	467	e328	e170	e145	e977	770	3,820	1,670	3,010	243	75
16	819	457	e318	e180	e138	e963	740	3,570	1,580	2,530	227	65
17	765	450	e315	e164	e142	e915	731	3,120	1,490	2,130	214	56
18	718	442	e325	e149	e152	e814	707	2,720	1,410	1,910	200	96
19	678	435	e328	e153	e149	e718	720	2,420	1,340	1,680	189	136
20	640	433	e316	e159	e157	e670	837	2,200	1,270	1,510	179	115
21	615	416	e302	e151	e153	e560	1,100	1,970	1,210	1,440	164	126
22	599	413	e282	e139	e146	e507	1,180	1,810	1,150	1,480	156	142
23	573	408	e283	e131	e143	e444	1,120	1,720	1,090	1,440	146	138
24	569	399	e285	e136	e133	e387	1,080	1,630	1,020	1,260	136	128
25	575	392	e295	e128	e127	e353	1,010	1,560	1,070	1,130	133	117
26	557	402	e283	e120	e132	e329	915	1,510	1,780	1,030	158	114
27	558	395	e296	e130	e136	e372	839	1,440	2,070	959	131	119
28	571	369	e290	e143	e139	e368	786	1,390	2,120	883	114	114
29	579	391	e282	e135	---	e348	750	1,310	2,110	810	110	110
30	596	384	e278	e148	---	e334	864	1,280	2,060	752	106	106
31	633	---	e263	e159	---	e329	---	1,250	---	704	99	---
TOTAL	25,746	14,359	10,136	5,852	4,218	12,810	21,094	78,470	44,750	68,028	8,703	2,891
MEAN	831	479	327	189	151	413	703	2,531	1,492	2,194	281	96.4
MAX	1,630	629	403	275	178	977	1,180	5,290	2,120	5,230	650	184
MIN	295	369	263	120	127	137	383	1,250	1,020	704	99	44
AC-FT	51,070	28,480	20,100	11,610	8,370	25,410	41,840	155,600	88,760	134,900	17,260	5,730
CFSM	0.54	0.31	0.21	0.12	0.10	0.27	0.46	1.65	0.97	1.43	0.18	0.06
IN.	0.63	0.35	0.25	0.14	0.10	0.31	0.51	1.91	1.09	1.65	0.21	0.07

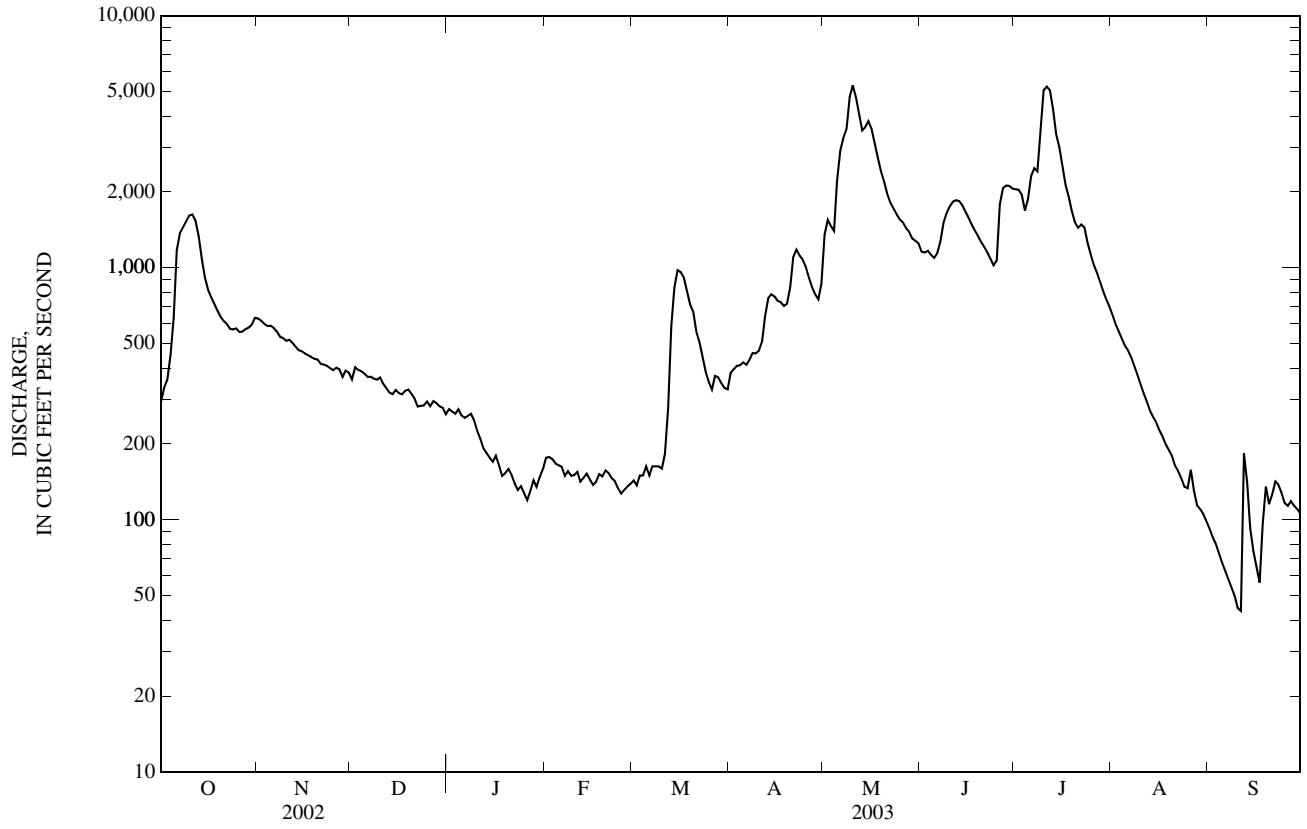
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 2003, BY WATER YEAR (WY)

MEAN	495	492	358	300	619	1,549	1,501	1,370	1,799	1,046	563	486
MAX	2,721	2,593	2,139	2,231	3,424	4,206	6,796	5,559	7,619	8,389	7,062	3,362
(WY)	(1987)	(1973)	(1983)	(1973)	(1915)	(1973)	(1965)	(1991)	(1918)	(1993)	(1993)	(1993)
MIN	39.2	46.2	31.0	10.2	20.9	98.4	99.3	49.9	16.0	41.8	35.9	27.5
(WY)	(1940)	(1940)	(1990)	(1977)	(1940)	(1934)	(1934)	(1934)	(1934)	(1977)	(1934)	(1939)

05451500 IOWA RIVER AT MARSHALLTOWN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1903 - 2003	
ANNUAL TOTAL	240,617		297,057			
ANNUAL MEAN	659		814		881	
HIGHEST ANNUAL MEAN					3,456	1993
LOWEST ANNUAL MEAN					77.3	1934
HIGHEST DAILY MEAN	2,690	May 13	5,290	May 10	39,400	Jun 4, 1918
LOWEST DAILY MEAN	211	Sep 17	44	Sep 11	4.7	Jan 25, 1977
ANNUAL SEVEN-DAY MINIMUM	224	Sep 13	55	Sep 5	5.2	Jan 20, 1977
MAXIMUM PEAK FLOW			5,420	May 10	42,000	Jun 4, 1918
MAXIMUM PEAK STAGE			16.37	May 10	20.77	Aug 17, 1993
INSTANTANEOUS LOW FLOW			32	Sep 11		
ANNUAL RUNOFF (AC-FT)	477,300		589,200		638,500	
ANNUAL RUNOFF (CFSM)	0.43		0.53		0.58	
ANNUAL RUNOFF (INCHES)	5.84		7.21		7.82	
10 PERCENT EXCEEDS	1,330		1,930		2,170	
50 PERCENT EXCEEDS	457		422		395	
90 PERCENT EXCEEDS	271		133		76	

e Estimated



05451700 TIMBER CREEK NEAR MARSHALLTOWN, IA

LOCATION.--Lat 42°00'32", long 92°51'08", in SE¼ SW¼ sec.8, T.83 N., R.17 W., Marshall County, Hydrologic Unit 07080208, on left bank 20 ft upstream from bridge on Shady Oaks Road, 3.0 mi upstream from mouth, and 3.0 mi southeast of Marshalltown.

DRAINAGE AREA.--118 mi^2.

PERIOD OF RECORD.--October 1949 to current year.

REVISED RECORDS.--WSP 1708: 1950-55, 1957-59.

GAGE.--Water stage recorder. Datum of gage is 849.44 ft above NGVD of 1929. Prior to Oct. 1, 1991 at site 1/8 mile upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 16.8 ft, discharge, 5,700 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	11	e9.6	e9.2	e5.8	e0.21	16	455	62	64	42	11
2	17	12	e10	e8.9	e5.4	e0.07	15	216	64	62	40	11
3	25	11	e12	e8.9	e4.8	e0.05	15	154	68	59	39	10
4	16	11	e10	e7.7	e3.7	e0.37	15	159	62	56	38	9.5
5	13	13	e10	e9.2	e2.3	e3.5	15	404	60	81	36	9.3
6	12	15	12	e7.8	e2.5	e3.5	14	230	76	76	37	9.0
7	11	12	16	e7.2	e0.81	e5.5	14	408	95	69	34	8.5
8	11	11	e17	e8.0	e1.3	e5.5	15	301	154	73	32	8.2
9	12	11	e11	e5.7	e1.5	e9.7	14	1,050	123	324	30	7.8
10	11	10	e13	e3.7	e1.9	e8.3	15	420	109	250	29	7.7
11	11	9.9	e15	e3.4	e4.2	e11	16	313	99	153	28	7.5
12	9.6	10	e14	e3.1	e1.7	e31	16	238	92	122	27	22
13	9.6	10	e14	e2.8	e2.9	e55	15	199	94	104	26	18
14	9.3	11	e14	e3.6	e4.9	e83	14	238	105	94	25	12
15	9.7	13	e14	e1.1	e2.2	e73	14	272	88	114	24	9.9
16	9.3	10	e11	e4.1	e0.95	e66	16	208	82	87	23	8.7
17	9.7	9.3	e16	e2.8	e3.8	e65	19	179	79	79	22	8.3
18	10	8.8	e13	e1.9	e8.1	e62	15	161	78	105	21	8.4
19	10	10	e12	e1.9	e4.3	e63	15	146	75	85	19	12
20	9.6	8.7	e9.4	e2.4	e7.9	e68	25	132	70	75	18	11
21	9.4	9.5	e6.4	e2.8	e6.7	e71	25	121	68	76	17	10
22	10	10	e7.9	e1.5	e6.1	71	22	112	66	66	16	13
23	9.6	8.4	e9.0	e1.2	e4.7	55	20	108	64	60	16	11
24	10	8.0	e8.7	e3.3	e2.9	26	20	99	62	57	15	12
25	14	9.7	e7.9	e2.1	e1.8	21	20	92	64	54	14	10
26	14	e16	e8.3	e1.1	e1.3	21	18	85	70	50	14	8.6
27	12	e12	e11	e1.9	e0.41	19	17	81	62	56	13	8.4
28	12	e9.1	e15	e3.2	e0.01	19	16	78	79	58	12	8.2
29	15	e9.1	e8.7	e2.4	---	17	16	73	74	49	12	7.5
30	13	e7.6	e8.7	e4.5	---	16	436	73	67	46	11	6.9
31	12	---	e7.9	e5.6	---	16	---	67	---	45	11	---
TOTAL	364.5	317.1	352.5	133.0	94.88	965.70	923	6,872	2,411	2,749	741	305.4
MEAN	11.8	10.6	11.4	4.29	3.39	31.2	30.8	222	80.4	88.7	23.9	10.2
MAX	25	16	17	9.2	8.1	83	436	1,050	154	324	42	22
MIN	7.7	7.6	6.4	1.1	0.01	0.05	14	67	60	45	11	6.9
AC-FT	723	629	699	264	188	1,920	1,830	13,630	4,780	5,450	1,470	606
CFSM	0.10	0.09	0.10	0.04	0.03	0.26	0.26	1.88	0.68	0.75	0.20	0.09
IN.	0.11	0.10	0.11	0.04	0.03	0.30	0.29	2.17	0.76	0.87	0.23	0.10

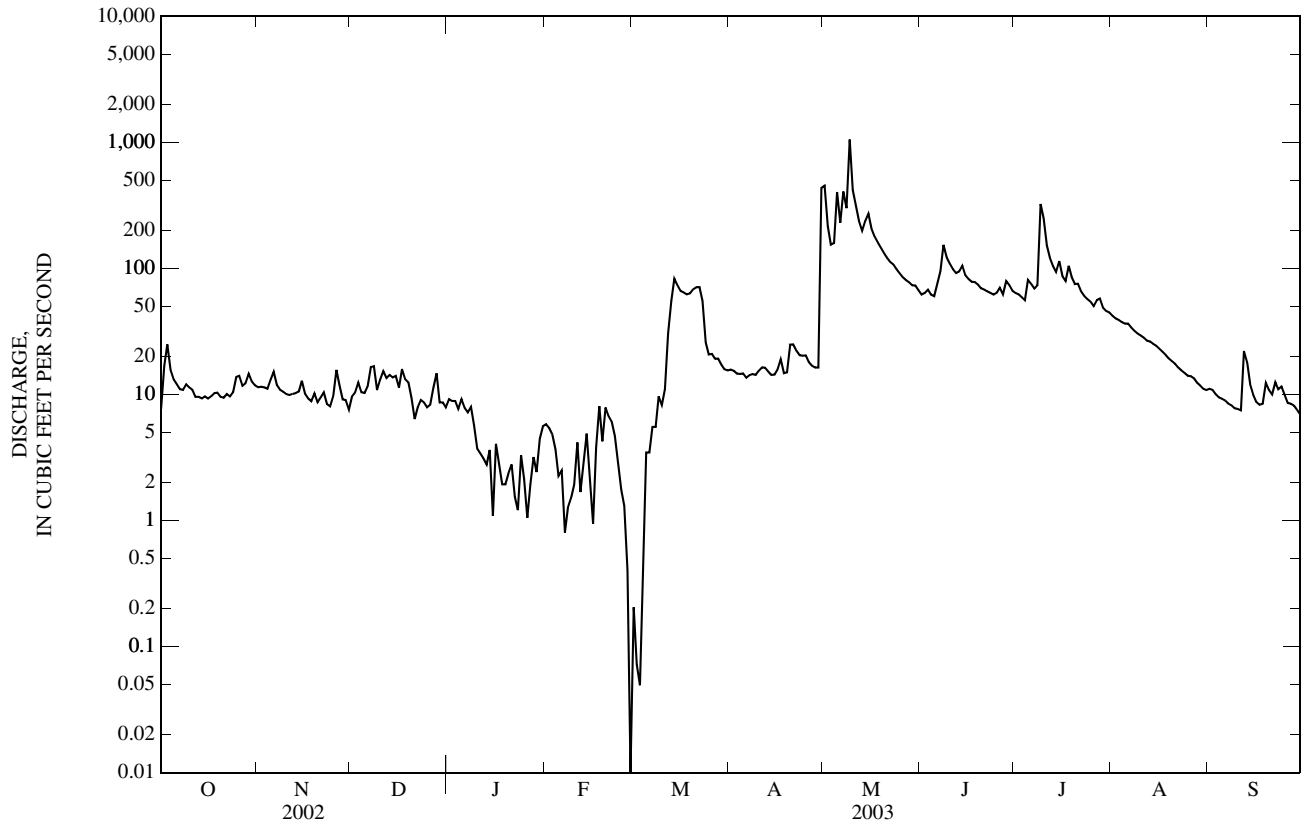
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2003, BY WATER YEAR (WY)

MEAN	35.6	38.1	34.3	34.4	82.1	139	108	129	156	93.6	56.2	36.7
MAX	286	265	183	200	351	597	385	447	704	866	635	341
(WY)	(1987)	(1984)	(1984)	(1973)	(1971)	(1979)	(1993)	(1974)	(1998)	(1993)	(1993)	(1986)
MIN	0.76	1.11	0.60	0.054	3.07	5.11	2.84	3.08	1.09	1.03	1.16	1.21
(WY)	(1951)	(1951)	(1956)	(1977)	(1954)	(1956)	(1956)	(1977)	(1977)	(1956)	(1956)	(1950)

05451700 TIMBER CREEK NEAR MARSHALLTOWN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1950 - 2003	
ANNUAL TOTAL	13,650.7		16,229.08			
ANNUAL MEAN	37.4		44.5		78.5	
HIGHEST ANNUAL MEAN					299	1993
LOWEST ANNUAL MEAN					2.84	1956
HIGHEST DAILY MEAN	994	Jun 18	1,050	May 9	6,570	Aug 16, 1977
LOWEST DAILY MEAN	6.4	Dec 21	0.01	Feb 28a	0.00	Jul 24, 1956b
ANNUAL SEVEN-DAY MINIMUM	8.2	Dec 20	0.35	Feb 26	0.00	Oct 4, 1956
MAXIMUM PEAK FLOW			1,490	May 9	12,000	Aug 16, 1977
MAXIMUM PEAK STAGE			12.95	May 9	17.69	Aug 16, 1977
INSTANTANEOUS LOW FLOW					0.00	Jul 24, 1956
ANNUAL RUNOFF (AC-FT)	27,080		32,190		56,850	
ANNUAL RUNOFF (CFSM)	0.32		0.38		0.67	
ANNUAL RUNOFF (INCHES)	4.30		5.12		9.04	
10 PERCENT EXCEEDS	70		99		173	
50 PERCENT EXCEEDS	19		14		31	
90 PERCENT EXCEEDS	9.6		3.5		3.3	

a Ice affected.
b Several days in July, Oct. 1956, Feb., July 1977.
e Estimated.



05451900 RICHLAND CREEK NEAR HAVEN, IA

LOCATION.--Lat 41°53'58", long 92°28'27", in SE¼ NE¼ sec.21, T.82 N., R.14 W., Tama County, Hydrologic Unit 07080208, on right bank 5 ft upstream from bridge on county highway, 0.5 mi northeast of Haven, and 3.0 mi upstream from mouth.

DRAINAGE AREA.--56.1 mi^2.

PERIOD OF RECORD.--October 1949 to current year.

REVISED RECORDS.--WSP 1708: 1950-55, 1956 (M), 1957, 1958 (M), 1959.

GAGE.--Water-stage recorder. Datum of gage is 788.69 ft above NGVD of 1929. Prior to Oct. 1, 1971, at datum 10.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1918 reached a stage of 24.3 ft present datum, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	19	e18	e8.1	e12	e14	8.5	577	37	29	23	6.0
2	51	19	e14	e7.1	e12	e11	7.6	211	38	27	21	5.4
3	52	19	e13	e6.5	e12	e10	7.3	161	40	26	20	4.8
4	29	18	e15	e6.3	e11	e9.8	7.5	206	36	24	20	4.4
5	23	19	e13	e5.8	e11	e8.9	7.0	347	33	26	19	4.3
6	20	19	e11	e5.0	e11	e7.5	6.3	200	72	27	19	4.1
7	18	18	e13	e6.8	e8.6	e8.4	7.5	208	74	27	17	3.4
8	17	18	e12	e9.6	e9.3	e7.8	8.3	185	77	36	16	3.1
9	15	18	e11	e8.3	e7.6	e6.4	7.6	503	71	191	16	3.0
10	14	17	e13	e5.7	e8.0	e7.2	9.8	237	64	133	15	3.0
11	13	16	e11	e7.4	e8.4	e9.2	11	223	56	80	15	2.6
12	13	15	e16	e9.6	e8.6	e55	10	173	51	59	13	5.5
13	13	16	e14	e9.8	e8.6	e116	8.9	152	48	49	12	7.2
14	13	16	e15	e9.7	e8.9	e133	8.1	170	45	44	12	7.4
15	13	15	e16	e9.0	e9.1	e107	7.3	165	41	161	12	3.7
16	13	15	e11	e10	e8.4	e62	7.9	141	37	62	12	3.0
17	13	15	e12	e10	e8.2	34	7.8	125	35	48	11	2.6
18	13	15	e14	e9.7	e11	20	7.0	113	35	110	10	2.4
19	12	14	e9.5	e9.5	e14	17	8.2	104	33	72	10	3.7
20	12	14	e9.4	e9.4	e25	16	14	91	30	50	9.3	2.8
21	12	14	e8.3	e9.4	e30	14	13	83	29	44	8.7	3.0
22	12	13	e7.0	e12	e30	13	11	78	28	37	7.8	3.6
23	12	14	e3.5	e8.2	e27	12	10	74	26	34	7.4	2.8
24	13	13	e7.4	e8.8	e19	11	11	68	25	31	6.9	2.3
25	18	e12	e10	e9.1	e12	11	11	62	30	29	6.1	2.0
26	19	e9.8	e12	e8.7	e10	10	9.9	57	44	26	8.0	2.2
27	16	e6.9	e7.5	e7.2	e12	11	9.4	53	29	34	6.2	2.5
28	18	e11	e9.8	e8.6	e16	11	8.9	51	40	29	5.6	2.2
29	19	e14	e11	e9.0	---	9.6	8.7	46	35	24	5.8	2.1
30	20	e13	e11	e10	---	8.7	388	46	30	24	5.3	1.9
31	19	---	e9.0	e10	---	8.7	---	40	---	24	5.4	---
TOTAL	552.8	455.7	357.4	264.3	368.7	780.2	648.5	4,950	1,269	1,617	375.5	107.0
MEAN	17.8	15.2	11.5	8.53	13.2	25.2	21.6	160	42.3	52.2	12.1	3.57
MAX	52	19	18	12	30	133	388	577	77	191	23	7.4
MIN	7.8	6.9	3.5	5.0	7.6	6.4	6.3	40	25	24	5.3	1.9
AC-FT	1,100	904	709	524	731	1,550	1,290	9,820	2,520	3,210	745	212
CFSM	0.32	0.27	0.21	0.15	0.23	0.45	0.39	2.85	0.75	0.93	0.22	0.06
IN.	0.37	0.30	0.24	0.18	0.24	0.52	0.43	3.28	0.84	1.07	0.25	0.07

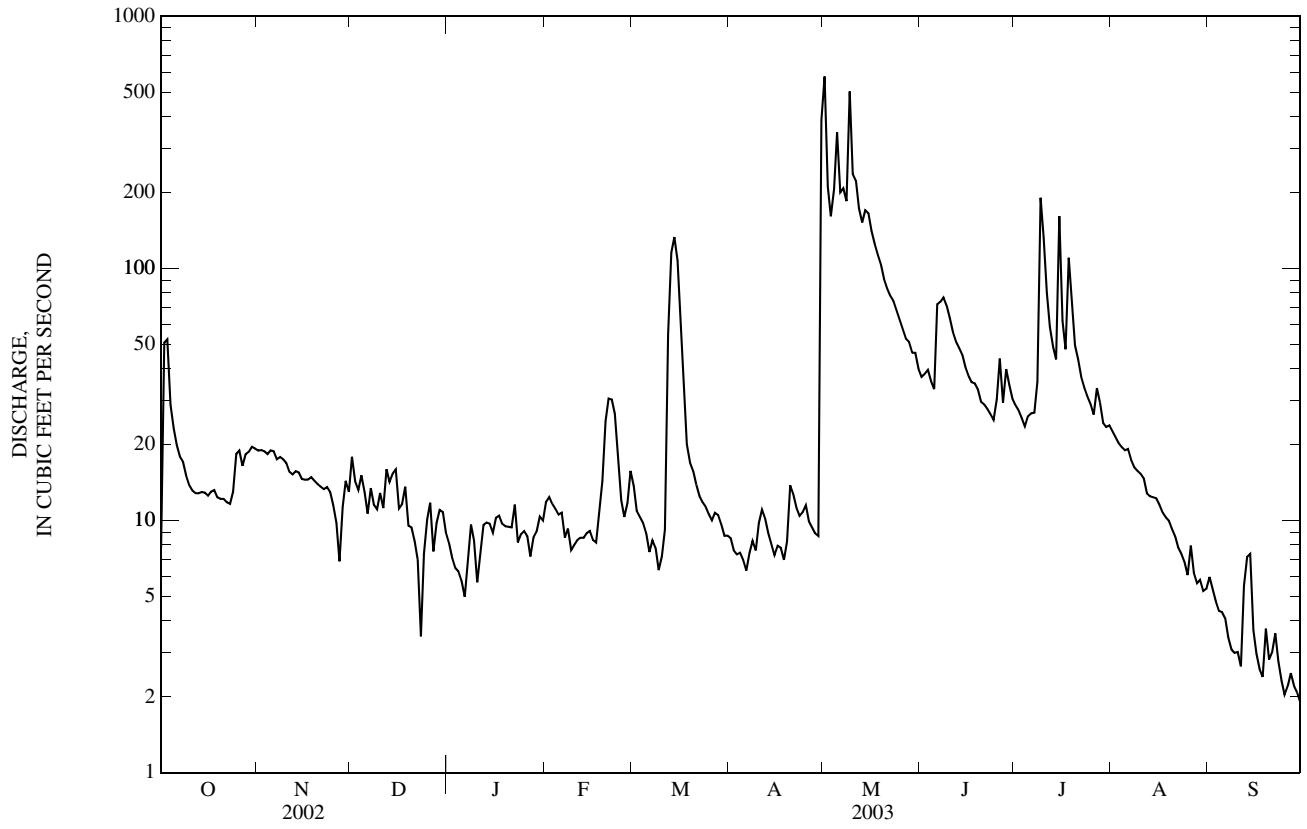
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2003, BY WATER YEAR (WY)

MEAN	18.0	22.0	16.7	18.8	41.9	66.3	57.0	62.5	68.0	45.0	31.1	18.9
MAX	105	122	85.8	104	165	270	323	337	270	463	427	159
(WY)	(1987)	(1984)	(1983)	(1960)	(1965)	(1979)	(1991)	(1974)	(1990)	(1993)	(1993)	(1993)
MIN	0.24	0.31	0.25	0.020	0.32	1.05	0.85	2.04	0.25	0.66	0.76	0.58
(WY)	(1957)	(1951)	(1957)	(1977)	(1989)	(1956)	(1956)	(1956)	(1956)	(1977)	(1955)	(1950)

05451900 RICHLAND CREEK NEAR HAVEN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1950 - 2003	
ANNUAL TOTAL	8,069.8		11,746.1			
ANNUAL MEAN	22.1		32.2		38.8	
HIGHEST ANNUAL MEAN					162	1993
LOWEST ANNUAL MEAN					2.49	1956
HIGHEST DAILY MEAN	413	Jun 13	577	May 1	2,880	Aug 16, 1977
LOWEST DAILY MEAN	3.5	Dec 23	1.9	Sep 30	0.00	Jan 22, 1977a
ANNUAL SEVEN-DAY MINIMUM	5.5	Jan 15	2.2	Sep 24	0.00	Jan 22, 1977
MAXIMUM PEAK FLOW			1,290	May 1	12,200	Apr 12, 1991
MAXIMUM PEAK STAGE			19.31	May 1	26.71	Apr 12, 1991
INSTANTANEOUS LOW FLOW			1.6	Sep 25b		
ANNUAL RUNOFF (AC-FT)	16,010		23,300		28,120	
ANNUAL RUNOFF (CFSM)	0.39		0.57		0.69	
ANNUAL RUNOFF (INCHES)	5.35		7.79		9.40	
10 PERCENT EXCEEDS	39		71		80	
50 PERCENT EXCEEDS	14		13		14	
90 PERCENT EXCEEDS	6.7		6.1		1.3	

a Also Jan. 23 to Feb. 2, 1977, July 9 and 10, 1959.
b Also Sept. 27, 30.
e Estimated.



05452000 SALT CREEK NEAR ELBERON, IA

LOCATION.--Lat 41°57'51", long 92°18'47", in NW¼ NW¼ sec.36, T.83 N., R.13 W., Tama County, Hydrologic Unit 07080208, on left bank 20 ft upstream from bridge on U.S. Highway 30, 2.0 mi upstream from Hog Run, 3.0 mi south of Elberon, and 9.0 mi upstream from mouth.

DRAINAGE AREA.--201 mi^2.

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946.

GAGE.--Water-stage recorder. Datum of gage is 781.58 ft above NGVD of 1929 (Iowa Highway Commission bench mark). Prior to Oct. 15, 1945 and June 14, 1947 to Feb. 10, 1949, nonrecording gage on upstream side of bridge at present datum.

REMARKS.--Records good except those for estimated daily discharge, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1944 reached a stage of 19.9 ft, from floodmark at downstream side of bridge, discharge, about 30,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	34	e27	e19	e12	e22	26	1,010	131	115	42	14
2	29	34	e24	e17	e13	e19	25	358	131	106	40	14
3	54	35	e24	e15	e12	e19	24	238	135	101	37	13
4	43	34	e24	e14	e12	e18	24	227	124	93	36	14
5	39	35	e22	e13	e12	e17	24	392	117	101	35	14
6	37	35	e19	e12	e11	e15	22	303	138	100	36	15
7	32	33	e22	e13	e9.3	e16	22	297	249	90	33	13
8	31	33	e20	e15	e10	e16	26	297	215	112	30	12
9	29	33	e19	e13	e9.5	e15	24	1,030	268	272	28	11
10	28	33	e21	e9.1	e9.0	e18	26	648	229	241	27	11
11	28	31	e20	e10	e10	e24	32	1,320	202	164	25	11
12	27	30	e26	e11	e10	e100	36	530	181	137	24	15
13	25	30	e25	e12	e10	e127	33	393	213	122	23	19
14	25	31	e23	e12	e11	e132	29	744	258	113	22	20
15	26	30	e26	e10	e11	e119	27	977	171	107	21	15
16	25	29	e23	e11	e10	e89	28	567	149	97	20	13
17	25	29	25	e11	e11	72	28	438	138	91	19	12
18	27	29	29	e10	e13	58	26	370	133	86	18	12
19	25	30	30	e9.9	e17	45	27	328	124	81	18	15
20	24	29	24	e9.8	e30	41	35	292	111	78	18	13
21	24	29	21	e9.7	e38	37	37	265	106	83	17	13
22	24	28	e17	e12	e40	33	34	248	102	74	16	15
23	23	28	e14	e8.1	e37	31	31	239	97	68	16	14
24	25	27	e18	e8.7	e30	30	29	222	92	66	16	12
25	33	24	e21	e8.9	e21	28	31	207	98	64	15	11
26	37	e22	24	e8.5	e18	26	28	192	245	61	21	11
27	34	e18	23	e6.9	e20	29	26	179	173	62	20	13
28	34	e24	25	e8.2	e23	30	26	175	159	56	15	12
29	35	e28	26	e8.8	---	28	25	162	149	50	14	11
30	36	e24	e25	e10	---	26	188	156	126	47	14	11
31	35	---	e21	e10	---	25	---	142	---	45	14	---
TOTAL	934	889	708	346.6	469.8	1,305	999	12,946	4,764	3,083	730	399
MEAN	30.1	29.6	22.8	11.2	16.8	42.1	33.3	418	159	99.5	23.5	13.3
MAX	54	35	30	19	40	132	188	1,320	268	272	42	20
MIN	15	18	14	6.9	9.0	15	22	142	92	45	14	11
AC-FT	1,850	1,760	1,400	687	932	2,590	1,980	25,680	9,450	6,120	1,450	791
CFSM	0.15	0.15	0.11	0.06	0.08	0.21	0.17	2.08	0.79	0.49	0.12	0.07
IN.	0.17	0.16	0.13	0.06	0.09	0.24	0.18	2.40	0.88	0.57	0.14	0.07

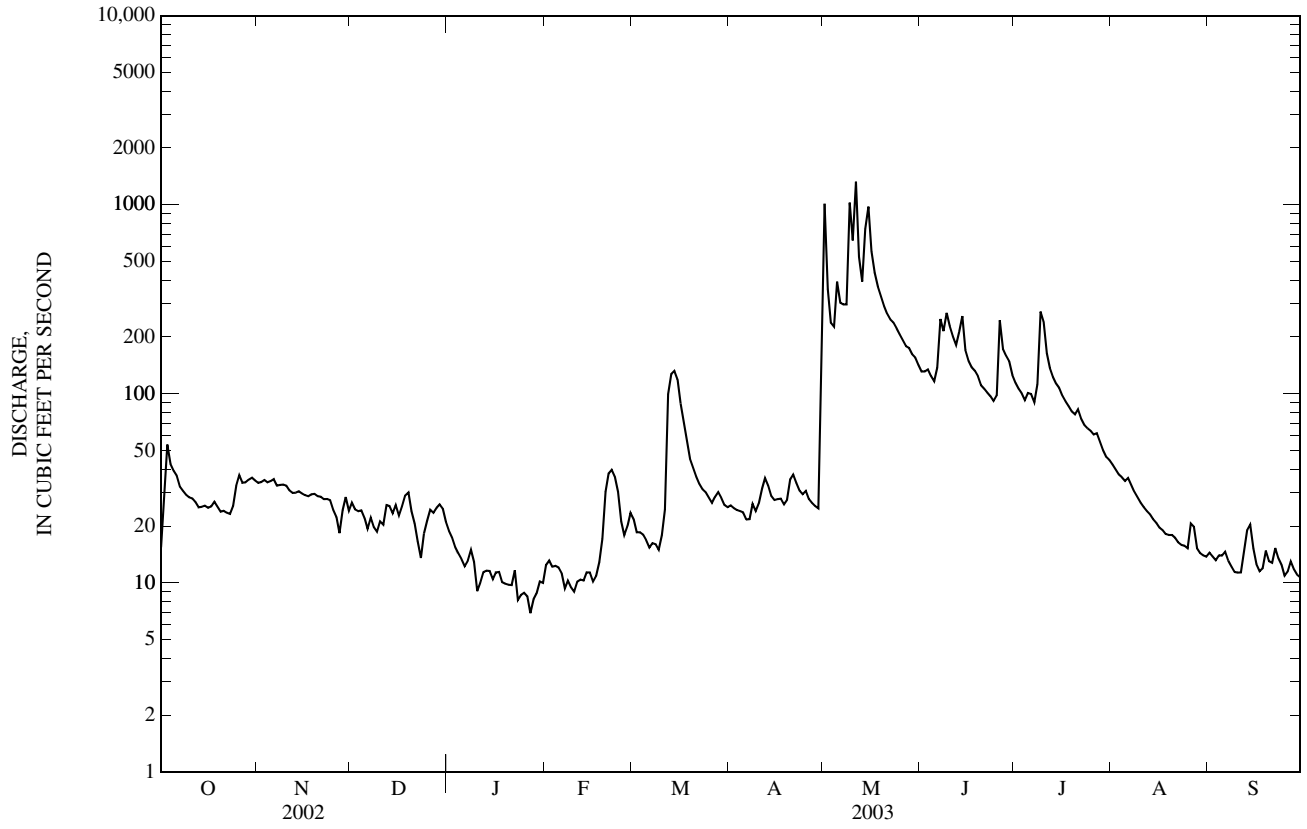
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 2003, BY WATER YEAR (WY)

MEAN	64.9	78.7	62.5	69.5	136	259	190	197	264	192	99.0	64.6
MAX	250	425	314	337	607	844	652	573	1,826	1,803	1,157	440
(WY)	(1978)	(1983)	(1983)	(1973)	(1982)	(1993)	(1983)	(1982)	(1947)	(1993)	(1993)	(1993)
MIN	4.85	4.08	2.29	1.14	7.02	11.7	11.0	5.75	7.79	3.84	5.65	5.43
(WY)	(1951)	(1951)	(1977)	(1977)	(1977)	(1954)	(1989)	(1977)	(1977)	(1989)	(1949)	(1950)

05452000 SALT CREEK NEAR ELBERON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1946 - 2003	
ANNUAL TOTAL	16,514		27,573.4			
ANNUAL MEAN	45.2		75.5		140	
HIGHEST ANNUAL MEAN					569	1993
LOWEST ANNUAL MEAN					23.2	1989
HIGHEST DAILY MEAN	577	Jun 13	1,320	May 11	14,000	Jul 9, 1993
LOWEST DAILY MEAN	14	Dec 23	6.9	Jan 27a	0.85	Jan 31, 1977
ANNUAL SEVEN-DAY MINIMUM	15	Sep 25	8.3	Jan 23	0.95	Jan 25, 1977
MAXIMUM PEAK FLOW			1,770	May 11	41,800	Jul 9, 1993
MAXIMUM PEAK STAGE			14.25	May 11	20.85	Jul 9, 1993
ANNUAL RUNOFF (AC-FT)	32,760		54,690		101,200	
ANNUAL RUNOFF (CFSM)	0.23		0.38		0.69	
ANNUAL RUNOFF (INCHES)	3.06		5.10		9.44	
10 PERCENT EXCEEDS	87		190		280	
50 PERCENT EXCEEDS	30		27		54	
90 PERCENT EXCEEDS	19		11		9.4	

a Ice affected.
e Estimated.



05452200 WALNUT CREEK NEAR HARTWICK, IA

LOCATION.--Lat 41°50'06", long 92°23'10", in SE¼ SW¼ sec.8, T.81 N, R.13 W., Poweshiek County, Hydrologic Unit 07080208, on right bank 5 ft downstream from bridge on county highway V21, 1.2 mi downstream from North Walnut Creek, 4.0 mi northwest of Hartwick, and 6.5 mi upstream from mouth.

DRAINAGE AREA.--70.9 mi^2.

PERIOD OF RECORD.--October 1949 to current year.

REVISED RECORDS.--WSP 1558: 1950 (P), 1951-57.

GAGE.--Water-stage recorder. Datum of gage is 786.59 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 17.7 ft, from information by local residents, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	23	e19	e9.7	e8.1	e8.8	8.7	296	34	32	25	6.3
2	80	22	e16	e9.0	e8.9	e6.5	8.1	155	35	31	23	5.9
3	64	22	e14	e7.7	e8.1	e5.7	8.0	113	35	29	21	5.5
4	40	21	e17	e7.5	e7.4	e6.5	7.9	172	33	27	21	4.8
5	30	21	e14	e6.8	e7.2	e5.0	6.9	284	32	28	20	4.3
6	25	20	e12	e6.0	e6.1	e3.4	6.3	169	64	36	21	4.3
7	21	19	e15	e7.1	e4.6	e5.0	8.1	150	72	33	19	4.2
8	20	18	e13	e8.2	e6.1	e4.2	7.5	140	82	47	17	3.8
9	18	18	e13	e6.8	e5.1	e2.7	7.1	393	79	234	16	3.7
10	17	17	e15	e3.5	e5.3	e1.9	9.3	285	72	141	15	3.6
11	16	16	e14	e4.6	e5.7	e5.7	11	337	65	93	15	3.6
12	15	16	e18	e6.4	e5.1	e16	9.7	185	60	74	14	4.6
13	14	16	e16	e6.5	e5.7	e92	8.1	150	56	62	14	6.4
14	13	16	e17	e6.4	e6.6	e153	7.3	137	53	54	13	7.7
15	13	15	e17	e5.4	e5.9	e123	6.6	126	48	147	12	4.2
16	13	14	e13	e6.5	e5.1	92	7.0	109	46	68	11	3.6
17	14	15	e13	e6.5	e4.5	47	6.4	97	43	56	10	3.2
18	13	15	e14	e5.8	e7.2	29	5.7	87	42	113	9.7	3.3
19	12	14	e11	e5.5	e10	24	6.7	81	40	76	8.9	4.2
20	12	14	e9.8	e5.5	e14	22	9.9	73	35	59	8.4	3.5
21	12	14	e9.2	e5.3	e21	18	8.7	68	34	53	7.9	3.8
22	12	14	e7.0	e7.6	e20	16	7.8	64	33	43	7.2	4.5
23	11	14	e4.2	e4.8	e18	14	7.4	62	31	38	7.0	3.4
24	13	14	e8.8	e5.2	e11	13	8.5	58	30	35	6.7	3.0
25	20	e13	e11	e5.4	e7.5	12	9.9	54	39	32	6.4	2.6
26	21	e9.7	e13	e5.0	e5.7	11	8.5	49	44	29	8.5	3.0
27	18	e7.0	e9.6	e3.8	e7.5	12	8.3	46	34	48	7.3	3.3
28	19	e11	e11	e4.1	e11	13	8.0	45	49	42	6.5	2.7
29	21	e16	e12	e3.9	---	11	7.7	42	40	33	6.3	2.5
30	24	e13	e12	e4.5	---	9.4	292	42	35	29	5.8	2.4
31	23	---	e11	e6.1	---	9.1	---	37	---	27	5.8	---
TOTAL	650.8	477.7	399.6	187.1	238.4	791.9	523.1	4,106	1,395	1,849	389.4	121.9
MEAN	21.0	15.9	12.9	6.04	8.51	25.5	17.4	132	46.5	59.6	12.6	4.06
MAX	80	23	19	9.7	21	153	292	393	82	234	25	7.7
MIN	6.8	7.0	4.2	3.5	4.5	1.9	5.7	37	30	27	5.8	2.4
AC-FT	1,290	948	793	371	473	1,570	1,040	8,140	2,770	3,670	772	242
CFSM	0.30	0.22	0.18	0.09	0.12	0.36	0.25	1.87	0.66	0.84	0.18	0.06
IN.	0.34	0.25	0.21	0.10	0.13	0.42	0.27	2.15	0.73	0.97	0.20	0.06

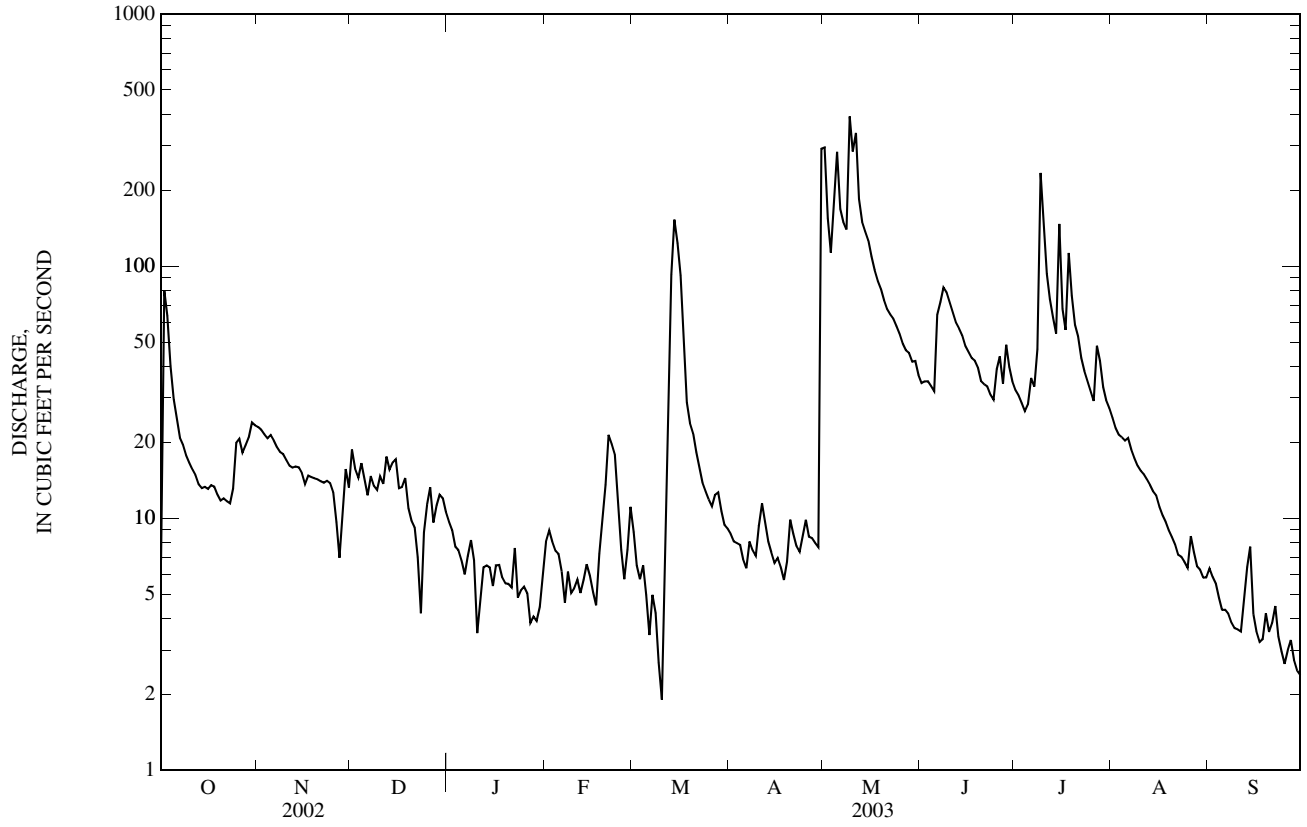
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2003, BY WATER YEAR (WY)

MEAN	19.2	26.7	22.2	24.9	49.9	82.1	74.4	80.1	83.0	54.9	34.5	23.3
MAX	137	171	109	179	191	300	365	452	450	461	498	185
(WY)	(1987)	(1984)	(1993)	(1960)	(1971)	(1993)	(1991)	(1974)	(1990)	(1993)	(1993)	(1993)
MIN	0.003	0.29	0.060	0.006	1.40	1.64	1.03	1.62	0.76	1.01	0.38	0.28
(WY)	(1957)	(1956)	(1977)	(1956)	(1954)	(1954)	(1957)	(1977)	(1956)	(1954)	(1955)	(1953)

05452200 WALNUT CREEK NEAR HARTWICK, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1950 - 2003	
ANNUAL TOTAL	8,489.2		11,129.9			
ANNUAL MEAN	23.3		30.5		47.9	
HIGHEST ANNUAL MEAN					200	1993
LOWEST ANNUAL MEAN					4.76	1956
HIGHEST DAILY MEAN	517	Jun 13	393	May 9	4,840	Jul 2, 1983
LOWEST DAILY MEAN	4.2	Dec 23	1.9	Mar 10a	0.00	Jul 31, 1954
ANNUAL SEVEN-DAY MINIMUM	5.5	Sep 12	2.8	Sep 24	0.00	Many days b
MAXIMUM PEAK FLOW			1,160	May 10	7,900	Apr 29, 1991
MAXIMUM PEAK STAGE			10.36	May 10	16.93	Apr 29, 1991
ANNUAL RUNOFF (AC-FT)	16,840		22,080		34,690	
ANNUAL RUNOFF (CFSM)	0.33		0.43		0.68	
ANNUAL RUNOFF (INCHES)	4.45		5.84		9.18	
10 PERCENT EXCEEDS	46		72		102	
50 PERCENT EXCEEDS	14		13		16	
90 PERCENT EXCEEDS	7.0		4.6		1.4	

a Ice affected.
b Many days in 1954-57 and 1977.
e Estimated.



05453000 BIG BEAR CREEK AT LADORA, IA

LOCATION.--Lat 41°44'58", long 92°10'55", in SW¼ SW¼ sec.7, T.80 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 10 ft downstream from bridge on county highway V52, 0.4 mi south of Ladora, 1.2 mi downstream from Coats Creek, 2.8 mi upstream from Little Bear Creek, and 8.1 mi upstream from mouth.

DRAINAGE AREA.--189 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as "Bear Creek at Ladora".

REVISED RECORDS.--WSP 1308: 1947 (M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.94 ft above NGVD of 1929. Oct. 1945 to June 26, 1946, non-recording gage and June 27, 1946 to Sept. 30, 1980, water-stage recorder at datum 10.00 ft higher.

REMARKS.--Records good except those for periods of estimated daily discharge, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	96	e37	e30	e23	e41	42	835	99	96	76	16
2	1,280	92	e36	e26	e26	e34	40	425	98	90	69	16
3	624	87	e35	e23	e26	e32	39	303	103	85	63	14
4	337	82	e36	e22	e27	e31	38	269	97	80	59	13
5	233	81	e34	e21	e26	e30	38	672	92	78	56	13
6	184	80	e34	e20	e26	e28	35	464	104	84	55	13
7	148	74	e37	e21	e24	e30	39	472	191	82	52	13
8	128	74	e35	e23	e26	e29	40	418	171	90	48	12
9	112	73	e34	e21	e25	e30	37	1,120	175	324	45	11
10	100	71	e37	e17	e26	e35	42	662	165	463	43	11
11	92	63	e36	e18	e26	e49	49	881	151	219	41	11
12	86	60	e42	e21	e27	e180	50	531	139	167	39	13
13	76	62	e40	e20	e27	e364	44	438	130	140	36	29
14	73	62	e38	e20	e27	e415	40	380	145	123	34	34
15	70	59	e41	e19	e28	e396	38	357	122	138	34	21
16	65	57	e40	e21	e27	293	37	310	115	120	33	14
17	64	56	42	e21	e31	166	37	277	110	101	30	12
18	64	59	50	e21	e34	110	35	251	105	250	28	12
19	59	57	48	e20	e48	83	38	233	105	278	26	14
20	54	56	39	e21	e63	73	56	213	94	144	28	15
21	54	55	35	e20	e78	63	54	193	89	121	26	14
22	52	52	e29	e23	e83	56	49	183	86	104	22	17
23	49	52	e22	e20	e76	51	47	175	83	91	20	16
24	54	50	e26	e21	e63	50	47	166	80	84	20	13
25	78	47	e29	e21	e55	48	57	152	84	78	19	12
26	98	e40	e32	e20	e50	45	50	140	132	72	20	12
27	79	e31	e31	e18	e43	46	46	130	96	153	23	13
28	79	e36	e34	e19	e44	49	45	127	120	290	18	13
29	82	e39	e36	e20	---	45	44	119	139	120	16	12
30	104	e35	e36	e20	---	43	108	116	106	95	15	12
31	105	---	e33	e19	---	41	---	108	---	87	15	---
TOTAL	4,703	1,838	1,114	647	1,085	2,986	1,361	11,120	3,526	4,447	1,109	441
MEAN	152	61.3	35.9	20.9	38.8	96.3	45.4	359	118	143	35.8	14.7
MAX	1,280	96	50	30	83	415	108	1,120	191	463	76	34
MIN	20	31	22	17	23	28	35	108	80	72	15	11
AC-FT	9,330	3,650	2,210	1,280	2,150	5,920	2,700	22,060	6,990	8,820	2,200	875
CFSM	0.80	0.32	0.19	0.11	0.21	0.51	0.24	1.90	0.62	0.76	0.19	0.08
IN.	0.93	0.36	0.22	0.13	0.21	0.59	0.27	2.19	0.69	0.88	0.22	0.09

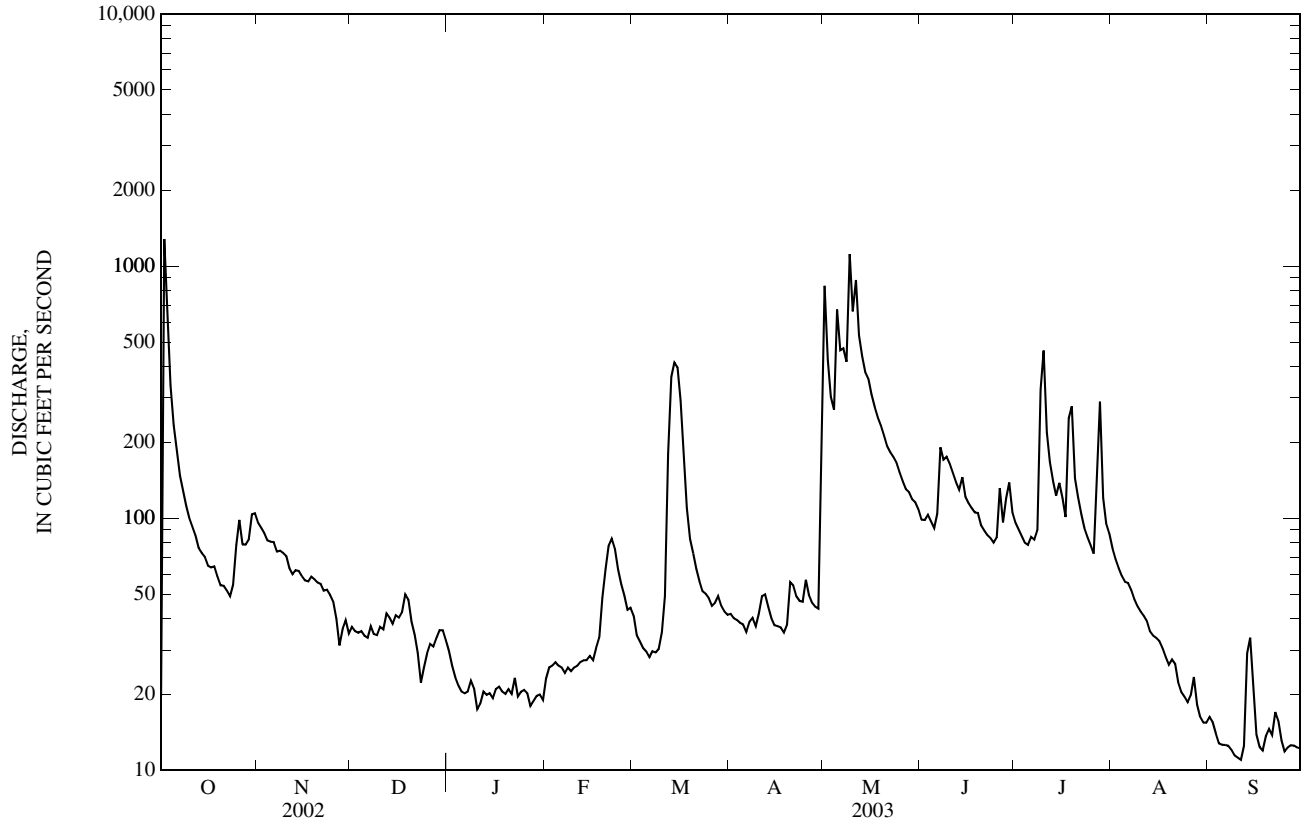
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 2003, BY WATER YEAR (WY)

MEAN	58.1	71.8	60.4	70.8	121	235	196	217	230	139	88.7	70.8
MAX	375	341	294	432	543	895	704	1,185	1,136	1,011	1,537	559
(WY)	(1987)	(1993)	(1983)	(1960)	(1971)	(1979)	(1973)	(1974)	(1947)	(1993)	(1993)	(1993)
MIN	0.49	1.68	0.33	0.021	2.07	5.99	4.17	2.25	2.94	5.00	2.36	1.34
(WY)	(1957)	(1956)	(1956)	(1977)	(1977)	(1957)	(1956)	(1956)	(1956)	(1988)	(1955)	(1956)

05453000 BIG BEAR CREEK AT LADORA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1946 - 2003	
ANNUAL TOTAL	30,598		34,377			
ANNUAL MEAN	83.8		94.2		130	
HIGHEST ANNUAL MEAN					516	1993
LOWEST ANNUAL MEAN					8.26	1956
HIGHEST DAILY MEAN	1,450	Jun 13	1,280	Oct 2	9,480	Mar 30, 1960
LOWEST DAILY MEAN	11	Jan 1	11	Sep 9a	0.00	Jan 22, 1956b
ANNUAL SEVEN-DAY MINIMUM	13	Jan 14	12	Sep 5	0.00	Jan 22, 1956
MAXIMUM PEAK FLOW			2,470	Oct 2	10,500	Mar 30, 1960
MAXIMUM PEAK STAGE			19.45	Oct 2	15.32	Sep 8, 1977c
INSTANTANEOUS LOW FLOW			11	Sep 9d		
ANNUAL RUNOFF (AC-FT)	60,690		68,190		94,020	
ANNUAL RUNOFF (CFSM)	0.44		0.50		0.69	
ANNUAL RUNOFF (INCHES)	6.02		6.77		9.33	
10 PERCENT EXCEEDS	181		187		280	
50 PERCENT EXCEEDS	44		49		46	
90 PERCENT EXCEEDS	18		19		5.8	

a Also Sept. 10, 11.
b Also Jan. 23 to Feb. 8, 1956, Jan. 19 to Feb. 3, 1977.
c Datum in use prior to Oct. 1, 1980.
d Also Sept. 10-12, 18, 25, 28, 29.
e Estimated.



05453100 IOWA RIVER AT MARENGO, IA

LOCATION.-- Lat 41°48'48", long 92°03'51", in SE¼ NE¼ sec.24, T.81 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 5 ft upstream from bridge on county highway V66, 1.0 mi downstream from Big Bear Creek, 0.8 mi north of Marengo, 4.6 mi upstream from Hilton Creek, and at mile 139.1.

DRAINAGE AREA.--2,794 mi^2.

PERIOD OF RECORD.--October 1956 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WSP 1558: 1957.

GAGE.--Water-stage recorder. Datum of gage is 720.52 ft above NGVD of 1929.

REMARKS.--Records good, except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	450	974	e537	e407	e241	e298	596	4,380	2,020	2,770	1,310	290
2	1,770	992	e585	e397	e253	e290	613	4,970	1,920	2,710	1,230	267
3	1,730	994	e537	e388	e242	e281	647	4,170	1,880	2,690	1,170	276
4	1,150	980	e527	e399	e237	e307	659	3,690	1,910	2,620	1,110	297
5	975	966	e500	e383	e232	e292	649	4,390	1,900	2,470	1,070	288
6	912	960	e485	e368	e227	e267	640	4,920	1,860	2,330	e1,070	278
7	994	950	e548	e362	e212	e279	657	5,490	2,040	e2,700	e1,050	273
8	1,370	936	e530	e368	e226	e289	662	5,710	2,310	e2,910	e1,020	265
9	1,590	918	e515	e341	e216	e285	664	6,760	e2,590	e3,390	e958	258
10	1,690	891	e516	e317	e215	e345	685	7,240	e2,790	e4,720	e907	253
11	1,770	865	e553	e278	e223	e441	713	7,820	e2,810	e5,300	e882	249
12	1,850	846	e597	e254	e224	e645	739	8,110	e2,800	e5,560	e845	251
13	1,850	838	e575	e249	e224	e1,180	762	8,570	e2,790	e5,830	e786	317
14	1,760	829	e559	e263	e237	e1,490	829	8,790	e2,780	e5,730	691	418
15	1,580	813	e571	e277	e253	e1,600	972	8,820	e2,740	5,210	664	418
16	1,380	796	e574	e265	e237	e1,590	1,040	8,700	e2,660	4,820	636	345
17	1,250	786	e598	e251	e233	e1,480	1,040	8,150	2,540	4,000	611	295
18	1,150	786	e677	e238	e271	1,360	1,020	7,410	2,380	3,400	572	269
19	1,070	779	729	e236	e339	1,190	1,020	6,510	e2,240	3,330	525	269
20	1,010	767	709	e243	e383	1,100	1,050	5,430	e2,130	2,810	502	268
21	958	754	675	e238	e411	970	1,090	4,610	e1,990	2,450	484	281
22	918	745	e594	e255	e443	895	1,230	4,090	e1,870	2,250	442	290
23	891	734	e487	e226	e415	818	1,540	3,710	1,770	2,090	406	278
24	892	724	e420	e208	e375	750	1,620	3,430	1,670	2,050	383	293
25	932	712	e395	e196	e325	701	1,610	3,210	1,630	1,960	361	283
26	975	685	e433	e198	e273	661	1,560	2,980	1,740	1,800	356	277
27	960	639	e442	e196	e279	637	1,460	2,790	1,970	1,700	349	275
28	928	e630	e423	e199	e288	627	1,340	2,640	2,560	1,920	335	273
29	923	e613	e419	e200	---	612	1,250	2,520	2,860	1,650	299	275
30	952	e564	e412	e205	---	593	1,480	2,340	2,850	1,500	277	271
31	971	---	e396	e213	---	589	---	2,180	---	1,400	271	---
TOTAL	37,601	24,466	16,518	8,618	7,734	22,862	29,837	164,530	68,000	96,070	21,572	8,640
MEAN	1,213	816	533	278	276	737	995	5,307	2,267	3,099	696	288
MAX	1,850	994	729	407	443	1,600	1,620	8,820	2,860	5,830	1,310	418
MIN	450	564	395	196	212	267	596	2,180	1,630	1,400	271	249
AC-FT	74,580	48,530	32,760	17,090	15,340	45,350	59,180	326,300	134,900	190,600	42,790	17,140
CFSM	0.43	0.29	0.19	0.10	0.10	0.26	0.36	1.90	0.81	1.11	0.25	0.10
IN.	0.50	0.33	0.22	0.11	0.10	0.30	0.40	2.19	0.91	1.28	0.29	0.12

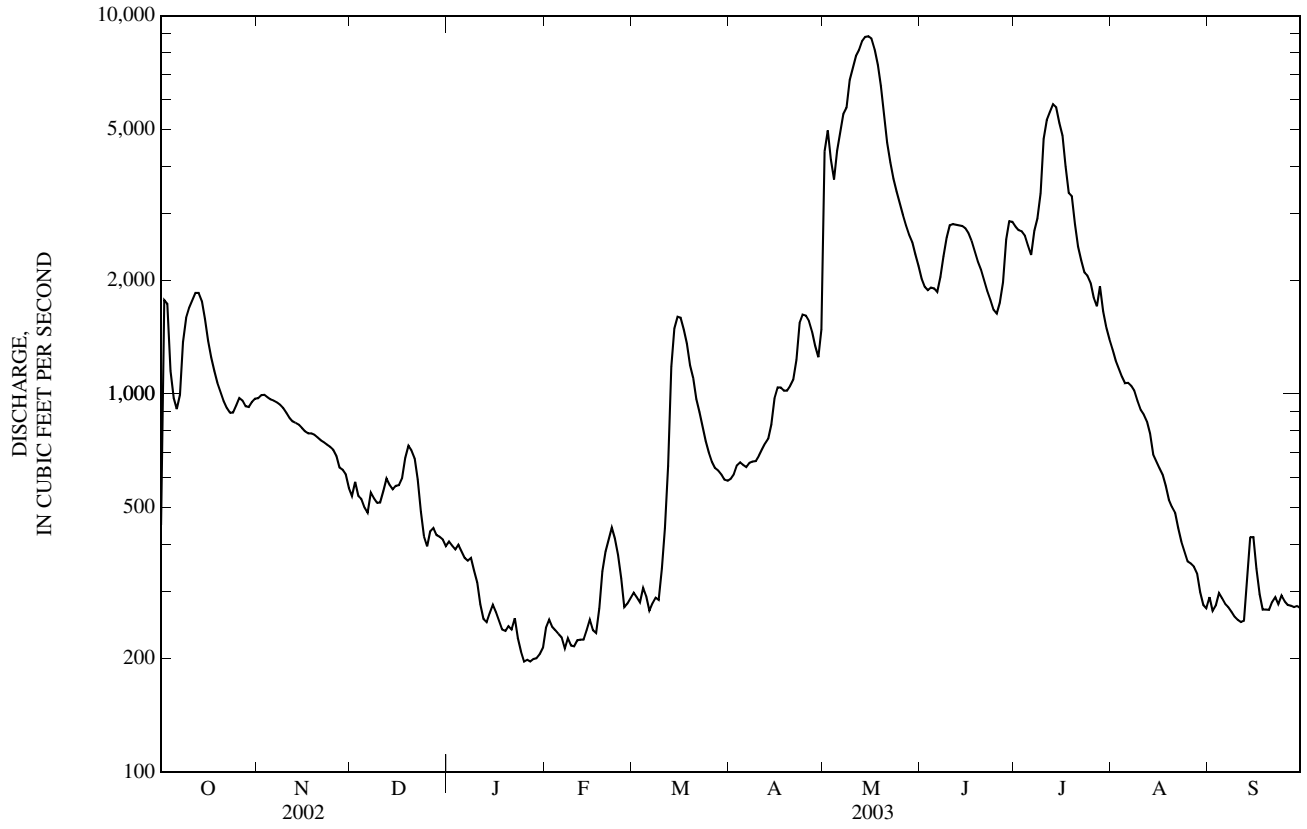
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2003, BY WATER YEAR (WY)

MEAN	1,002	1,123	931	804	1,351	3,085	3,288	3,072	3,389	2,692	1,472	982
MAX	5,078	3,878	3,633	4,194	5,424	8,227	11,310	9,340	9,287	19,620	15,290	7,901
(WY)	(1987)	(1973)	(1983)	(1973)	(1984)	(1979)	(1993)	(1991)	(1998)	(1993)	(1993)	(1993)
MIN	80.8	90.0	63.0	31.3	79.0	256	259	179	114	116	108	123
(WY)	(1957)	(1957)	(1990)	(1977)	(1977)	(1964)	(1977)	(1977)	(1977)	(1977)	(1989)	(1988)

05453100 IOWA RIVER AT MARENGO, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1957 - 2003	
ANNUAL TOTAL	394,286		506,448			
ANNUAL MEAN	1,080		1,388		1,934	
HIGHEST ANNUAL MEAN					7,192	1993
LOWEST ANNUAL MEAN					283	1989
HIGHEST DAILY MEAN	4,310	Jun 14	8,820	May 15	35,600	Jul 12, 1993
LOWEST DAILY MEAN	282	Feb 4	196	Jan 25a	24	Jan 29, 1977
ANNUAL SEVEN-DAY MINIMUM	313	Feb 1	200	Jan 24	25	Jan 28, 1977
MAXIMUM PEAK FLOW			8,880	May 15	38,000	Jul 19, 1993
MAXIMUM PEAK STAGE			15.83	May 15	20.31	Jul 19, 1993
ANNUAL RUNOFF (AC-FT)	782,100		1,005,000		1,401,000	
ANNUAL RUNOFF (CFSM)	0.39		0.50		0.69	
ANNUAL RUNOFF (INCHES)	5.25		6.74		9.41	
10 PERCENT EXCEEDS	2,200		3,070		4,850	
50 PERCENT EXCEEDS	793		767		980	
90 PERCENT EXCEEDS	438		255		210	

a Also Jan. 27; Ice affected.
e Estimated.



05453510 CORALVILLE LAKE NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'29", long 91°31'40", in SW¼ NE¼ sec.22, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080208, at outlet works at left end of Coralville Dam on Iowa River, 2.3 mi upstream from Rapid Creek, 4.3 mi northeast of Coralville post office, and at mile 83.3.

DRAINAGE AREA.--3,115 mi^2.

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is at NGVD 0f 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1957. Storage began in September 1958. Releases controlled by three gates, 8.33 ft wide and 20 ft high, into forechamber of 23-ft diameter concrete conduit through dam. Inlet invert elevation at 646.0 ft. No dead storage. Maximum design discharge through gates is 20,000 ft^3/s. Ungated spillway is concrete overflow section 500 ft in length at elevation 712 ft above sea level, contents, 469,000 acre-ft, surface area, 24,800 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will lower the elevation from 683 ft. (surface area 5,430 acres) on Feb. 15 to 679 ft (surface area 3,270 acres) on Mar 1, maintaining 679 ft. Mar. 1 to June 15, 683 ft June 15 to Sept. 15, 686 ft. (surface area 7,000 acres) Sept. 15 to Dec. 15, and 683 ft Dec. 15 to Feb. 15, with a minimum release of 150 ft^3/s and maximum release of 10,000 ft^3/s Dec. 15 to May 1 and 6,000 ft^3/s May 1 to Dec. 15. Prior to October 1, 2000 published as contents in acre feet, and as elevation in feet NGVD thereafter.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

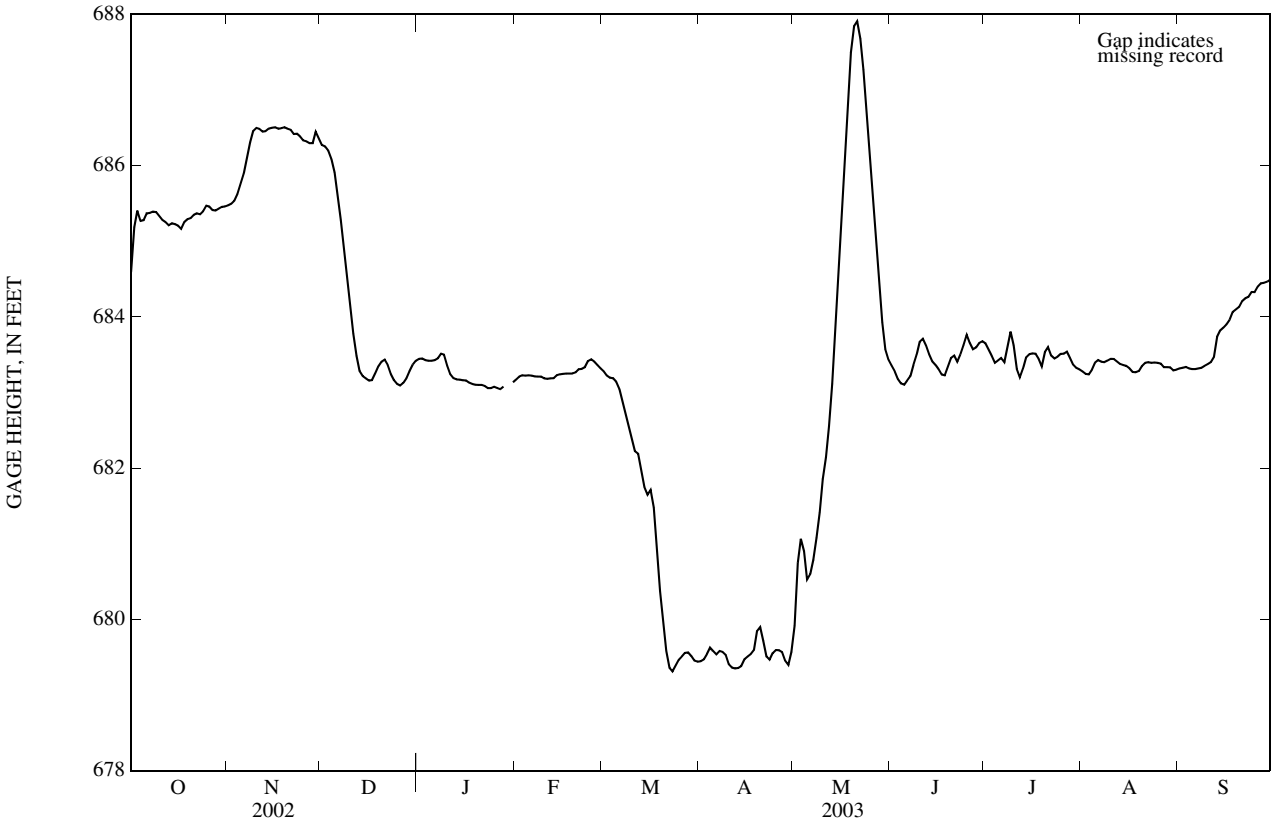
EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 716.71 ft July 24, 1993; minimum elevation, 658.77 ft Mar. 10, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 687.91 ft May 21, 22; minimum elevation, 679.31 ft Mar. 24.

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY OBSERVATION AT 0600 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	684.39	685.46	686.31	683.43	683.14	683.31	679.44	679.63	683.41	683.68	683.30	683.31
2	684.66	685.48	686.26	683.45	683.18	683.27	679.45	680.01	683.34	683.64	683.27	683.32
3	685.36	685.50	686.25	683.45	683.22	683.21	679.48	680.99	683.26	683.54	683.24	683.33
4	685.42	685.55	686.18	683.42	683.23	683.19	679.56	681.09	683.15	683.47	683.24	683.34
5	685.22	685.65	686.06	683.42	683.22	683.19	679.65	680.84	683.11	683.37	683.32	683.31
6	685.30	685.80	685.86	683.42	683.23	683.13	679.56	680.42	683.10	683.44	683.42	683.31
7	685.39	685.92	685.51	683.43	683.22	683.02	679.53	680.66	683.18	683.46	683.43	683.31
8	685.37	686.15	685.20	683.46	683.21	682.83	679.60	680.83	683.23	683.38	683.40	683.32
9	685.40	686.36	684.82	683.53	683.21	682.66	679.56	681.16	683.41	683.67	683.40	683.33
10	685.38	686.49	684.43	683.49	683.21	682.50	679.52	681.50	683.53	683.85	683.43	683.36
11	685.32	686.50	684.06	683.31	683.18	682.33	679.37	681.97	683.72	683.55	683.45	683.38
12	685.27	686.48	683.68	683.22	683.18	682.19	679.36	682.20	683.71	683.23	683.44	683.41
13	685.25	686.44	683.42	683.18	683.19	682.19	679.35	682.67	683.59	683.19	683.40	683.49
14	685.20	686.46	683.24	683.17	683.19	681.88	679.36	683.26	683.48	683.36	683.37	683.82
15	685.25	686.50	683.21	683.17	683.24	681.71	679.39	684.02	683.39	683.50	683.36	683.82
16	685.22	686.50	683.18	683.16	683.24	681.63	679.50	684.89	683.36	683.51	683.35	683.87
17	685.20	686.51	683.15	683.16	683.25	681.74	679.51	685.66	683.29	683.52	683.31	683.91
18	685.15	686.48	683.17	683.12	683.25	681.39	679.55	686.36	683.22	683.51	683.26	683.98
19	685.29	686.50	683.28	683.11	683.25	680.72	679.61	687.04	683.23	683.42	683.27	684.09
20	685.29	686.51	683.37	683.10	683.25	680.26	679.92	687.65	683.38	683.32	683.29	684.10
21	685.31	686.48	683.42	683.10	683.27	679.89	679.89	687.91	683.48	683.61	683.37	684.14
22	685.36	686.47	683.44	683.10	683.32	679.48	679.66	687.91	683.49	683.60	683.40	684.23
23	685.37	686.40	683.34	683.08	683.31	679.32	679.46	687.60	683.38	683.45	683.40	684.25
24	685.35	686.43	683.21	683.05	683.34	679.31	679.47	687.16	683.55	683.45	683.39	684.27
25	685.41	686.37	683.15	683.06	683.44	679.42	679.58	686.61	683.65	683.48	683.40	684.35
26	685.49	686.32	683.10	683.08	683.44	679.48	679.60	686.02	683.80	683.52	683.39	684.32
27	685.45	686.32	683.09	683.05	683.40	679.52	679.59	685.44	683.61	683.51	683.38	684.43
28	685.40	686.29	683.14	683.04	683.35	679.57	679.56	684.88	683.56	683.55	683.32	684.45
29	685.41	686.30	683.21	683.09	---	679.56	679.42	684.34	683.61	683.43	683.34	684.45
30	685.44	686.50	683.31	---	---	679.50	679.39	683.79	683.67	683.35	683.33	684.47
31	685.46	---	683.39	683.12	---	679.44	---	683.50	---	683.32	683.28	---
MEAN	685.28	686.24	684.08	---	683.26	681.32	679.53	683.81	683.43	683.48	683.35	683.82
MAX	685.49	686.51	686.31	---	683.44	683.31	679.92	687.91	683.80	683.85	683.45	684.47
MIN	684.39	685.46	683.09	---	683.14	679.31	679.35	679.63	683.10	683.19	683.24	683.31

05453510 CORALVILLE LAKE NEAR CORALVILLE, IA—Continued



05453520 IOWA RIVER BELOW CORALVILLE DAM NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'23", long 91°31'47", in SW¼ NE¼ sec.22, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080208, on left bank about 500 ft downstream of Coralville Dam control house, 2.3 miles upstream from Rapid Creek, 4.3 miles northeast of Coralville post office, and at mile 83.2.

DRAINAGE AREA.--3,115 mi^2.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 600.00 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good. U.S. Army Corps of Engineers satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

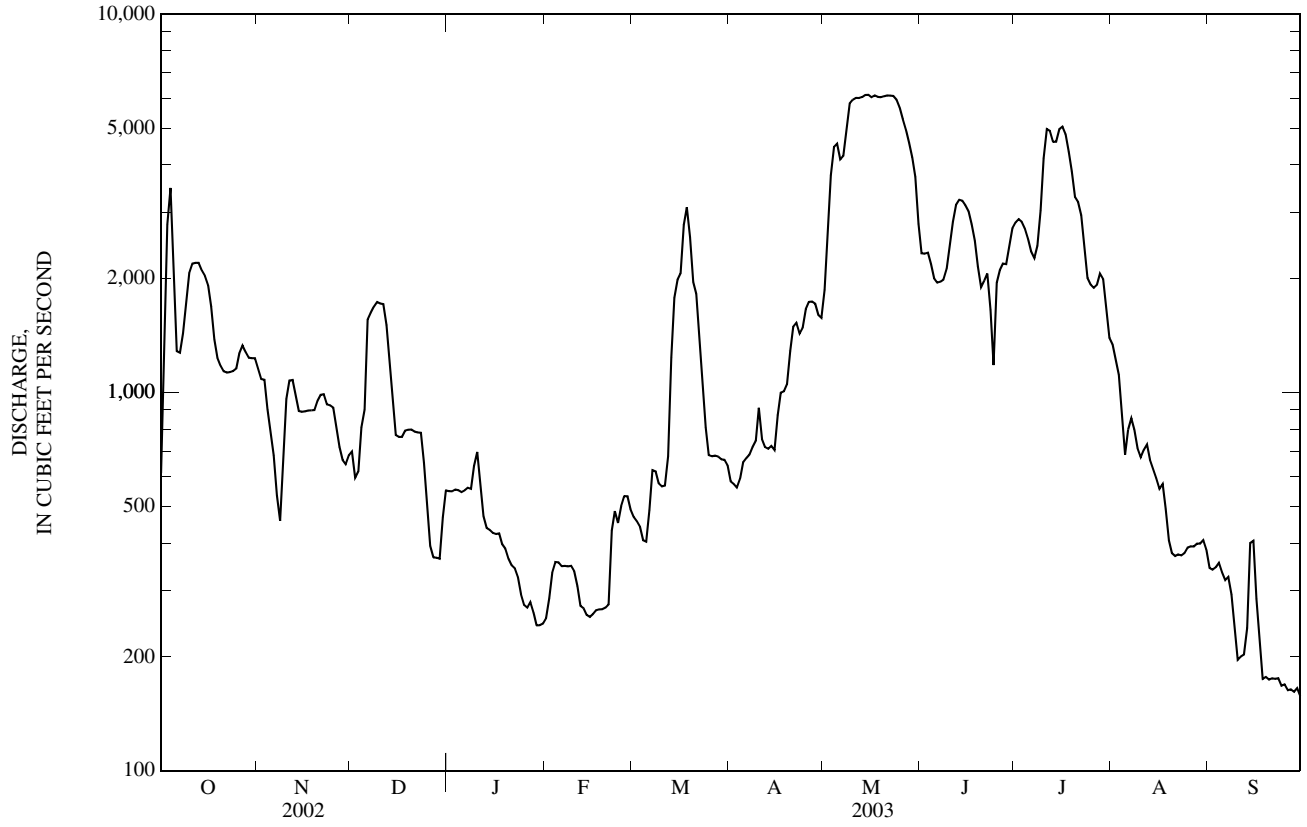
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	612	1,160	698	548	253	469	582	1,870	2,330	2,820	1,340	344
2	1,280	1,090	595	548	285	457	573	2,580	2,330	2,870	1,230	340
3	2,780	1,080	618	554	334	442	560	3,750	2,340	2,830	1,110	345
4	3,480	903	808	552	356	407	592	4,460	2,190	2,710	878	354
5	1,900	784	901	545	355	403	654	4,550	2,000	2,550	685	335
6	1,290	682	1,560	551	347	489	670	4,130	1,950	2,360	797	320
7	1,270	534	1,630	560	348	623	685	4,220	1,960	2,270	854	325
8	1,430	458	1,690	556	347	619	717	4,900	1,990	2,440	797	292
9	1,740	632	1,730	640	348	575	745	5,810	2,120	3,030	712	241
10	2,070	961	1,720	696	337	565	911	5,950	2,450	4,170	674	196
11	2,190	1,080	1,710	586	308	568	753	6,010	2,830	4,970	706	201
12	2,200	1,080	1,510	471	273	678	718	6,010	3,140	4,920	729	203
13	2,200	986	1,240	439	269	1,240	710	6,050	3,230	4,600	663	238
14	2,100	893	959	433	258	1,780	723	6,120	3,210	4,610	627	400
15	2,030	889	772	425	255	1,990	705	6,130	3,130	4,970	593	405
16	1,920	892	763	423	260	2,070	870	6,040	3,010	5,040	556	285
17	1,690	897	763	424	265	2,770	999	6,100	2,790	4,820	573	219
18	1,380	897	793	397	267	3,090	1,010	6,050	2,520	4,330	492	175
19	1,240	899	797	386	267	2,580	1,050	6,040	2,150	3,850	406	177
20	1,180	950	798	364	270	1,960	1,290	6,070	1,900	3,290	376	174
21	1,140	986	788	350	275	1,820	1,490	6,110	1,980	3,190	369	175
22	1,130	990	784	343	431	1,430	1,530	6,090	2,060	2,940	373	175
23	1,130	930	782	325	486	1,080	1,430	6,080	1,650	2,400	371	176
24	1,140	925	652	292	452	808	1,480	5,950	1,180	2,010	376	168
25	1,160	912	494	274	501	683	1,660	5,680	1,950	1,930	389	169
26	1,270	811	393	270	532	678	1,740	5,280	2,100	1,890	392	163
27	1,330	719	366	279	532	681	1,740	4,940	2,190	1,930	392	164
28	1,280	662	366	262	491	677	1,720	4,580	2,190	2,060	399	162
29	1,240	646	363	242	---	666	1,600	4,180	2,430	1,990	399	165
30	1,230	682	468	243	---	664	1,580	3,720	2,720	1,690	407	158
31	1,230	---	551	245	---	641	---	2,790	---	1,400	384	---
TOTAL	49,262	26,010	28,062	13,223	9,702	33,603	31,487	158,240	70,020	96,880	19,049	7,244
MEAN	1,589	867	905	427	346	1,084	1,050	5,105	2,334	3,125	614	241
MAX	3,480	1,160	1,730	696	532	3,090	1,740	6,130	3,230	5,040	1,340	405
MIN	612	458	363	242	253	403	560	1,870	1,180	1,400	369	158
AC-FT	97,710	51,590	55,660	26,230	19,240	66,650	62,450	313,900	138,900	192,200	37,780	14,370
CFSM	0.51	0.28	0.29	0.14	0.11	0.35	0.34	1.64	0.75	1.00	0.20	0.08
IN.	0.59	0.31	0.34	0.16	0.12	0.40	0.38	1.89	0.84	1.16	0.23	0.09

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2003, BY WATER YEAR (WY)

MEAN	1,130	1,106	1,273	711	1,627	2,936	3,235	4,054	4,441	5,039	2,832	1,610
MAX	4,012	2,771	4,229	1,723	3,006	6,587	7,776	9,347	7,203	20,610	18,500	13,050
(WY)	(1994)	(1993)	(1993)	(1993)	(1997)	(1993)	(1993)	(1993)	(1993)	(1993)	(1993)	(1993)
MIN	211	156	230	231	346	426	445	412	2,334	1,389	581	241
(WY)	(2000)	(2000)	(2000)	(2000)	(2003)	(2000)	(2000)	(2000)	(2003)	(2002)	(1997)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1993 - 2003	
ANNUAL TOTAL	468,564		542,782			
ANNUAL MEAN	1,284		1,487		2,505	
HIGHEST ANNUAL MEAN					7,910	1993
LOWEST ANNUAL MEAN					866	2000
HIGHEST DAILY MEAN	4,610	Jun 16	6,130	May 15	25,000	Jul 21, 1993
LOWEST DAILY MEAN	287	Feb 5	158	Sep 30	129	Oct 26, 1999
ANNUAL SEVEN-DAY MINIMUM	370	Sep 12	164	Sep 24	141	Oct 23, 1999
MAXIMUM PEAK FLOW			6,360	May 15	25,800	Jul 19, 1993
MAXIMUM PEAK STAGE			53.64	May 15	63.95	Jul 19, 1993
ANNUAL RUNOFF (AC-FT)	929,400		1,077,000		1,815,000	
ANNUAL RUNOFF (CFSM)	0.41		0.48		0.80	
ANNUAL RUNOFF (INCHES)	5.60		6.48		10.93	
10 PERCENT EXCEEDS	2,300		3,790		6,110	
50 PERCENT EXCEEDS	1,100		870		1,260	
90 PERCENT EXCEEDS	458		277		273	

05453520 IOWA RIVER BELOW CORALVILLE DAM NEAR CORALVILLE, IA—Continued



05453600 RAPID CREEK BELOW MORSE, IA

LOCATION.--Lat 41°43'45", long 91°25'38", in NE corner of sec.21, T.80 N., R.5 W., Johnson County, Hydrologic Unit 07080209, at bridge on county highway, 1.5 miles southwest of Morse.

DRAINAGE AREA.--8.12 mi^2.

PERIOD OF RECORD.--Operated May 1951 to September 1992 as a crest-stage partial record station. March 1994 to current year.

GAGE.--Tipping bucket rain gage.

REMARKS.--Estimated totals Nov. 11. Estimated values taken from U.S. Geological Survey gaging station 05454000, Rapid Creek nr Iowa City. Records good except for estimated days and winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.65 in., May 9, 1996, June 13, 2000.

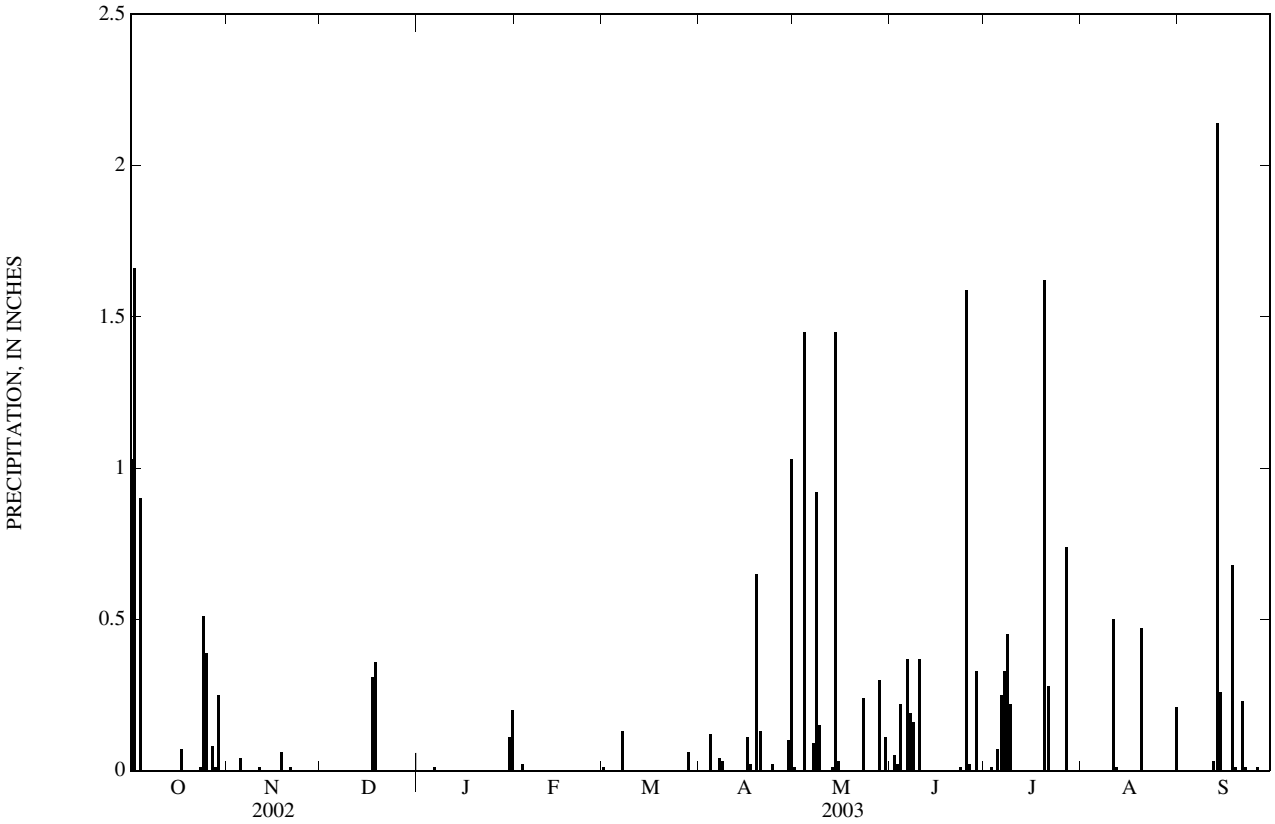
EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.14 in., Sept. 13.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.03	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
2	1.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.01	0.00	0.00
4	0.90	0.00	0.00	0.00	0.00	0.00	0.12	1.45	0.22	0.00	0.00	0.00
5	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
6	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.37	0.25	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.13	0.04	0.09	0.19	0.33	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.92	0.16	0.45	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.22	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00
11	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	2.14
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	0.00	0.00	0.00	0.26
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00
17	0.07	0.00	0.31	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
18	0.00	0.06	0.36	0.00	0.00	e0.00	0.00	0.00	0.00	0.00	0.00	0.68
19	0.00	0.00	0.00	0.00	0.00	e0.00	0.65	0.00	0.00	0.00	0.00	0.01
20	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	1.62	0.47	0.00
21	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.23
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.01	0.00	0.00	0.00
24	0.51	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
25	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01
27	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00
28	0.01	0.00	0.00	0.00	0.00	0.06	0.00	0.30	0.33	0.00	0.00	0.00
29	0.25	0.00	0.00	0.00	---	0.00	0.10	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.11	---	0.00	1.03	0.11	0.00	0.00	0.00	0.00
31	0.00	---	0.00	0.20	---	0.00	---	0.00	---	0.00	0.21	---
TOTAL	4.91	0.12	0.67	0.32	0.02	0.20	2.25	4.76	3.33	3.97	1.19	3.37
MEAN	0.16	0.00	0.02	0.01	0.00	0.01	0.07	0.15	0.11	0.13	0.04	0.11
MAX	1.66	0.06	0.36	0.20	0.02	0.13	1.03	1.45	1.59	1.62	0.50	2.14
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

e Estimated

05453600 RAPID CREEK BELOW MORSE, IA—Continued



05454000 RAPID CREEK NEAR IOWA CITY, IA

LOCATION.--Lat 41°42'00", long 91°29'15", in NE¼ NE¼ sec.36. T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on left bank 80 ft upstream from bridge on State Highway 1, 3.5 mi northeast of Iowa City, and 4.7 mi upstream from mouth.

DRAINAGE AREA.--25.3 mi^2.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1558: 1941 (M), 1943 (P), 1944 (M), 1946. WSP 1708: 1951 (P), 1952. WDR IA-67-1: Drainage area.

GAGE.--Water-stage recorder and concrete control with sharp-crested weir. Datum of gage is 673.72 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with telephone modem, and U.S. Army Corps of Engineers rain gage and satellite data collection platform.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	12	5.3	4.2	4.5	2.9	4.0	33	9.7	6.7	2.9	0.51
2	58	12	5.8	4.4	5.0	2.7	3.7	26	9.7	6.2	2.5	0.56
3	38	11	4.8	4.0	5.4	2.8	3.6	20	9.8	6.0	2.1	0.56
4	74	11	4.7	4.3	4.5	3.1	3.7	26	9.3	5.4	2.0	0.46
5	50	11	e4.1	4.6	3.7	2.4	3.7	110	9.4	5.1	2.1	0.26
6	33	9.8	e3.8	4.1	e3.2	2.7	3.0	58	10	5.4	1.7	0.17
7	25	8.9	5.5	4.2	e2.8	2.8	3.7	44	10	6.1	1.8	0.12
8	21	9.5	5.0	5.1	e3.6	2.9	3.4	38	11	8.5	1.3	0.06
9	18	9.3	3.9	4.5	e3.0	2.1	3.2	157	10	13	1.2	0.04
10	16	9.0	5.0	3.2	e3.0	1.9	4.6	70	13	12	1.3	0.03
11	14	7.8	5.2	3.4	e3.2	2.6	4.7	51	13	8.7	2.5	0.03
12	13	7.2	5.4	3.6	e3.3	52	4.2	40	11	7.1	2.5	0.02
13	11	7.4	5.4	3.9	e3.1	46	3.7	34	11	6.3	0.94	1.1
14	11	7.8	5.3	3.3	e3.1	19	3.6	64	9.8	5.8	0.81	7.4
15	11	7.3	5.4	2.9	e3.3	16	3.5	96	9.1	5.1	0.75	1.1
16	9.9	6.9	5.1	3.2	e2.8	17	3.5	49	8.3	4.4	0.65	0.47
17	9.6	6.9	5.0	e3.0	e2.5	15	3.8	39	7.9	4.1	0.57	0.23
18	9.5	7.0	9.9	e2.9	2.7	12	3.1	32	7.6	3.9	0.46	0.13
19	8.6	6.8	8.4	e2.8	e4.3	9.5	5.2	29	7.1	3.8	0.37	0.62
20	7.8	6.6	6.4	e3.0	e7.8	8.4	11	25	6.3	3.6	0.31	0.64
21	7.8	6.6	5.6	e2.5	9.9	7.1	11	22	6.1	51	0.56	0.44
22	7.6	6.5	e4.0	2.5	9.5	6.6	9.0	20	5.8	9.6	0.52	0.41
23	7.1	6.5	e3.1	e2.3	6.4	5.5	7.7	20	5.5	6.7	0.31	0.33
24	8.1	6.2	e4.1	e2.2	4.9	5.6	7.2	18	5.3	5.3	0.36	0.50
25	12	5.7	4.6	e2.4	4.4	5.2	6.6	16	11	4.5	0.30	0.37
26	12	e4.7	3.9	e2.2	3.1	4.6	5.8	15	18	3.7	0.40	0.36
27	10	e3.2	4.6	e2.3	9.4	4.7	5.4	13	11	12	0.31	0.25
28	10	e4.5	5.0	e2.6	3.6	4.8	4.9	14	9.9	9.6	0.28	0.23
29	11	6.7	5.0	e2.9	---	4.1	4.6	12	8.7	5.3	0.29	0.34
30	12	5.6	5.8	4.2	---	3.3	15	12	7.5	4.1	0.21	0.14
31	12	---	4.7	4.1	---	3.4	---	11	---	3.5	0.29	---
TOTAL	551.0	231.4	159.8	104.8	126.0	278.7	160.1	1,214	281.8	242.5	32.59	17.88
MEAN	17.8	7.71	5.15	3.38	4.50	8.99	5.34	39.2	9.39	7.82	1.05	0.60
MAX	74	12	9.9	5.1	9.9	52	15	157	18	51	2.9	7.4
MIN	3.0	3.2	3.1	2.2	2.5	1.9	3.0	11	5.3	3.5	0.21	0.02
AC-FT	1,090	459	317	208	250	553	318	2,410	559	481	65	35
CFSM	0.70	0.30	0.20	0.13	0.18	0.36	0.21	1.55	0.37	0.31	0.04	0.02
IN.	0.81	0.34	0.23	0.15	0.19	0.41	0.24	1.79	0.41	0.36	0.05	0.03

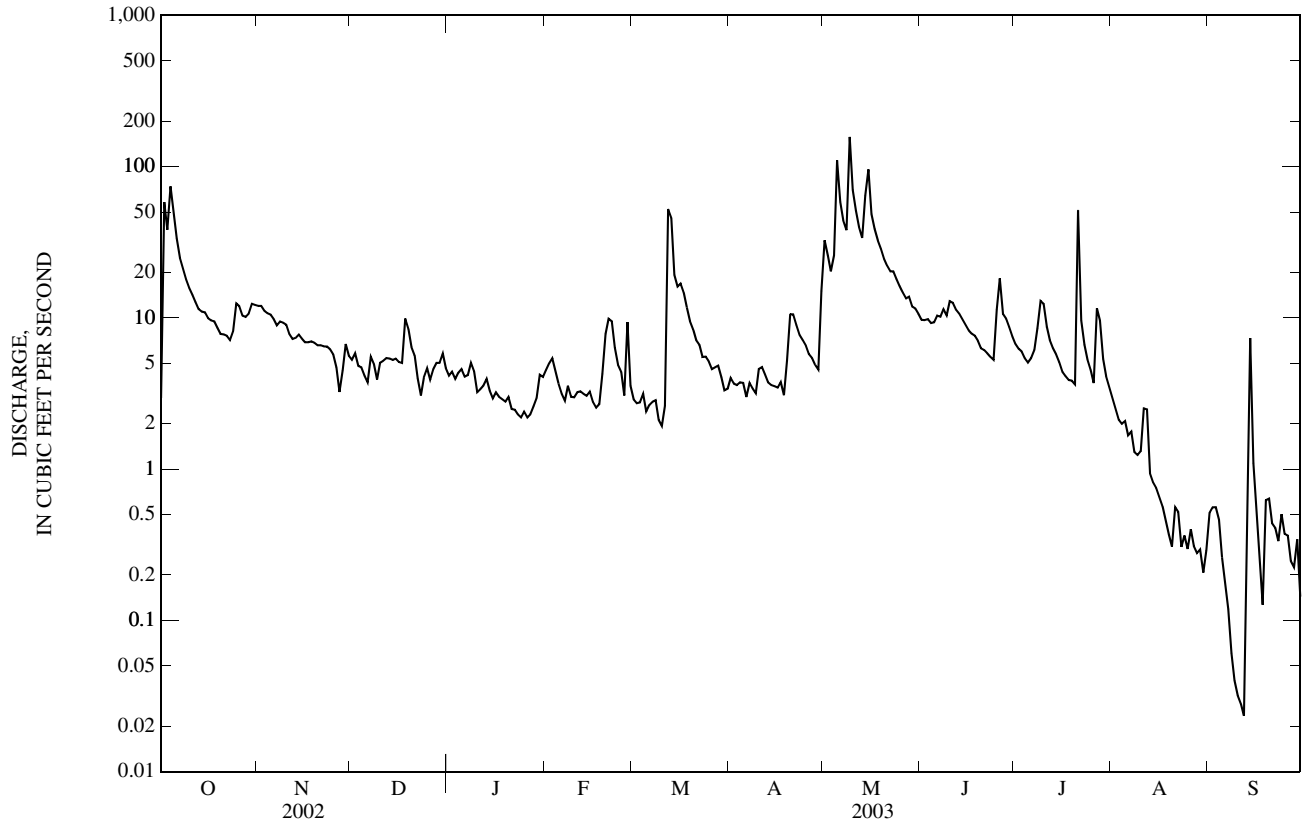
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2003, BY WATER YEAR (WY)

MEAN	7.69	10.1	8.81	9.40	22.2	28.7	24.2	27.5	25.5	15.8	11.5	7.71
MAX	83.5	84.0	66.6	56.8	77.5	106	98.6	167	134	105	176	66.6
(WY)	(1999)	(1993)	(1983)	(1946)	(1953)	(1979)	(1973)	(1974)	(1990)	(1969)	(1993)	(1965)
MIN	0.000	0.000	0.000	0.000	0.22	0.42	1.25	1.13	0.21	0.000	0.032	0.000
(WY)	(1954)	(1956)	(1956)	(1940)	(1989)	(1956)	(1956)	(1977)	(1956)	(1957)	(1955)	(1955)

05454000 RAPID CREEK NEAR IOWA CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1938 - 2003	
ANNUAL TOTAL	5,298.2		3,400.57			
ANNUAL MEAN	14.5		9.32		16.5	
HIGHEST ANNUAL MEAN					63.8	1993
LOWEST ANNUAL MEAN					1.09	1957
HIGHEST DAILY MEAN	143	Aug 23	157	May 9	1,720	May 17, 1986
LOWEST DAILY MEAN	1.6	Sep 30	0.02	Sep 12	0.00	Many years
ANNUAL SEVEN-DAY MINIMUM	1.9	Sep 24	0.07	Sep 6	0.00	Many years
MAXIMUM PEAK FLOW			377	May 14	6,700	Aug 10, 1993
MAXIMUM PEAK STAGE			7.09	May 14	15.61	Aug 10, 1993
ANNUAL RUNOFF (AC-FT)	10,510		6,750		11,980	
ANNUAL RUNOFF (CFSM)	0.57		0.37		0.65	
ANNUAL RUNOFF (INCHES)	7.79		5.00		8.88	
10 PERCENT EXCEEDS	32		18		35	
50 PERCENT EXCEEDS	9.0		5.1		5.0	
90 PERCENT EXCEEDS	3.2		0.54		0.10	

e Estimated



05454220 CLEAR CREEK NEAR OXFORD, IA

LOCATION.--Lat 41°43'06", long 91°44'24", in SW¼ SE¼ SE¼ sec.23, T.80 N., R.8 W., Johnson County, Hydrologic Unit 07080209, on left bank 15 ft. downstream of bridge on NW Eagle Avenue, 0.2 miles west of Kent Park, 2.6 miles upstream of Buffalo Creek, 2.8 miles east of Oxford, and 4.2 miles west of Tiffin.

DRAINAGE AREA.--58.4 mi^2.

PERIOD OF RECORD.--November 1993 to current year.

GAGE.--Water stage recorder. Datum of gage is 696.50 ft., above NGVD of 1929.

REMARKS.--Records good except for those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	24	e15	e9.8	e9.0	e10	9.8	22	15	15	9.3	1.0
2	241	23	e13	e8.9	e10	e7.6	9.1	e18	16	14	e8.0	0.99
3	127	23	e12	e8.2	e9.1	e7.1	8.9	e16	18	13	e7.0	0.92
4	77	22	e14	e7.7	e8.6	e7.2	8.7	e25	17	13	6.2	0.87
5	53	22	e13	e7.2	e8.1	e6.5	8.3	e55	16	12	5.0	0.87
6	40	21	e12	e7.0	e7.8	e6.2	7.1	e37	20	14	5.2	0.87
7	33	20	e14	e8.0	e6.8	e7.1	8.4	24	22	15	4.6	0.87
8	29	20	e12	e10	e7.7	e6.5	8.7	24	20	e33	3.9	0.86
9	25	20	e11	e7.8	e7.1	e6.2	7.8	141	21	e63	3.6	0.85
10	21	19	e12	e5.1	e7.0	e6.1	10	88	21	e49	3.3	0.84
11	20	18	e11	e5.9	e7.2	e8.2	10	69	20	30	3.1	0.80
12	18	17	e14	e7.5	e7.3	e15	9.3	55	19	24	2.9	1.0
13	17	17	e13	e8.0	e7.2	e66	8.6	48	19	21	2.9	5.9
14	17	17	e15	e7.9	e7.5	109	8.1	44	19	18	2.6	13
15	17	16	e17	e7.4	e7.7	90	7.8	40	17	16	2.5	3.6
16	15	16	e15	e7.6	e7.1	72	7.8	36	16	15	2.3	1.6
17	15	16	e15	e7.7	e7.1	49	7.4	33	15	14	2.1	1.0
18	16	16	19	e7.4	e8.4	32	7.4	31	15	13	1.7	0.91
19	14	16	14	e7.7	e10	21	11	29	17	12	1.4	1.4
20	14	15	12	e7.6	e17	18	32	27	14	11	1.9	1.1
21	14	15	12	e5.9	e24	16	27	25	14	26	1.7	0.97
22	14	14	e8.2	e8.0	e23	14	21	24	14	13	1.3	1.0
23	13	14	e3.3	e5.5	e20	13	18	24	13	11	1.1	0.94
24	15	14	e7.9	e6.0	e15	13	18	23	13	10	1.0	0.88
25	24	13	e9.6	e6.1	e9.8	12	18	22	16	11	1.0	0.72
26	25	e11	e11	e5.6	e8.4	11	16	20	30	9.3	0.99	0.71
27	21	e7.1	e9.0	e5.2	e10	12	15	19	18	12	0.94	0.75
28	22	e11	e12	e6.1	e13	12	14	19	19	13	0.92	0.74
29	23	e14	e13	e6.6	---	9.7	13	17	17	13	0.91	0.73
30	26	e12	e14	e7.2	---	8.4	14	17	15	12	0.90	0.74
31	25	---	e11	e8.0	---	9.0	---	16	---	11	0.97	---
TOTAL	1,034.4	503.1	384.0	224.6	290.9	680.8	370.2	1,088	526	556.3	91.23	47.43
MEAN	33.4	16.8	12.4	7.25	10.4	22.0	12.3	35.1	17.5	17.9	2.94	1.58
MAX	241	24	19	10	24	109	32	141	30	63	9.3	13
MIN	3.4	7.1	3.3	5.1	6.8	6.1	7.1	16	13	9.3	0.90	0.71
AC-FT	2,050	998	762	445	577	1,350	734	2,160	1,040	1,100	181	94
CFSM	0.57	0.29	0.21	0.12	0.18	0.38	0.21	0.60	0.30	0.31	0.05	0.03
IN.	0.66	0.32	0.24	0.14	0.19	0.43	0.24	0.69	0.34	0.35	0.06	0.03

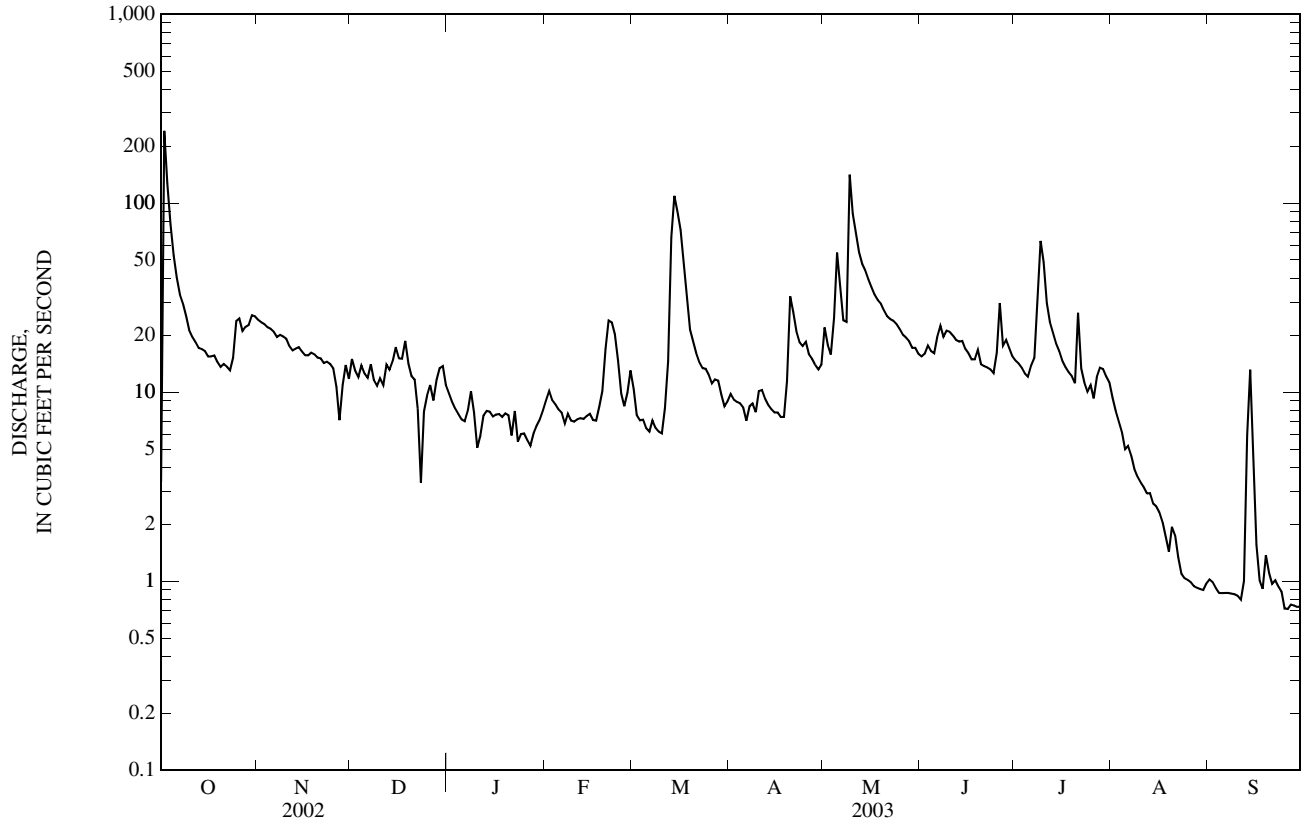
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2003, BY WATER YEAR (WY)

MEAN	25.8	17.3	10.3	14.2	46.3	47.4	54.6	94.9	70.5	30.7	13.5	6.93
MAX	153	74.4	28.1	35.2	129	152	113	269	120	77.0	44.5	29.4
(WY)	(1999)	(1999)	(1999)	(1998)	(2001)	(2001)	(1998)	(1996)	(2001)	(2000)	(1998)	(1998)
MIN	1.74	2.30	2.07	3.04	6.00	5.71	8.16	15.0	17.5	10.4	2.94	1.35
(WY)	(1996)	(2000)	(2000)	(2000)	(2000)	(2000)	(1996)	(2000)	(2003)	(1997)	(2003)	(1999)

05454220 CLEAR CREEK NEAR OXFORD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1995 - 2003	
ANNUAL TOTAL	9,482.45		5,796.96			
ANNUAL MEAN	26.0		15.9		35.9	
HIGHEST ANNUAL MEAN					56.4	1999
LOWEST ANNUAL MEAN					15.9	2003
HIGHEST DAILY MEAN	241	Oct 2	241	Oct 2	2,400	May 10, 1996
LOWEST DAILY MEAN	0.95	Sep 26	0.71	Sep 26	0.71	Sep 26, 2003
ANNUAL SEVEN-DAY MINIMUM	1.1	Sep 23	0.75	Sep 24	0.75	Sep 24, 2003
MAXIMUM PEAK FLOW			383	Oct 2	4,230	May 10, 1996
MAXIMUM PEAK STAGE			8.32	Mar 13	14.89	May 10, 1996
INSTANTANEOUS LOW FLOW			0.67	Sep 25a		
ANNUAL RUNOFF (AC-FT)	18,810		11,500		26,040	
ANNUAL RUNOFF (CFSM)	0.44		0.27		0.62	
ANNUAL RUNOFF (INCHES)	6.04		3.69		8.36	
10 PERCENT EXCEEDS	58		25		85	
50 PERCENT EXCEEDS	17		13		14	
90 PERCENT EXCEEDS	6.8		1.4		2.4	

a Also Sept. 26, 28.
e Estimated



05454300 CLEAR CREEK NEAR CORALVILLE, IA

LOCATION.--Lat 41°40'36", long 91°35'55", in NE¼ SE¼ sec.1, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank about 15 ft upstream from bridge on county highway, 1.1 mi west of post office in Coralville, 1.5 mi downstream from Deer Creek, and 2.7 mi upstream from mouth.

DRAINAGE AREA.--98.1 mi^2.

PERIOD OF RECORD.--October 1952 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WDR IA-93-1: 1974 (M), 1982 (M), 1990 (M).

GAGE.--Water-stage recorder. Datum of gage is 647.48 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers). Prior to Jan. 7, 1957, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. U.S. Geological Survey data collection platform with telephone modem and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	39	e24	e16	e13	e16	18	65	27	19	21	4.8
2	407	38	e22	e15	e14	e14	17	44	27	19	21	4.8
3	302	37	e21	e13	e13	e14	17	37	29	18	19	4.5
4	201	37	e22	e12	e13	e13	18	46	29	17	22	4.1
5	114	36	e19	e12	e12	e12	18	87	28	17	19	4.3
6	77	35	e16	e11	e12	e11	16	59	32	21	19	4.2
7	59	33	e18	e12	e10	e12.0	19	49	36	23	18	4.1
8	52	33	e16	e14	e11	e11	19	50	35	42	18	4.2
9	46	32	e15	e12	e10	e10	18	288	33	83	17	4.2
10	43	31	e17	e8.0	e10	e10	18	170	35	82	15	4.1
11	39	30	e16	e9.0	e10	e12.0	18	116	32	41	11	4.4
12	36	28	e23	e11	e11	e21	17	94	31	33	8.6	4.3
13	34	29	e22	e11	e11	e96	16	80	30	29	e7.0	22
14	33	28	e25	e11	e11	e138	16	77	29	26	e6.2	36
15	33	28	e27	e10	e11	e160	15	71	24	23	e5.6	17
16	31	27	e23	e11	e10	e131	15	66	22	21	e5.2	9.7
17	31	26	e24	e11	e10	e58.0	15	62	21	20	e4.9	7.5
18	31	27	e33	e10	e12	e50	14	59	21	19	4.5	6.4
19	29	27	27	e10	e14.0	42	29	58	23	19	4.8	8.7
20	27	26	22	e10	e22.0	35	55	56	20	19	4.6	6.4
21	27	26	20	e10	e28.0	32	50	51	19	120	5.6	7.0
22	27	26	e15	e12	e28	28	39	48	19	34	4.2	6.1
23	26	25	e5.7	e9.0	e26	26	32	47	19	28	4.1	4.4
24	29	25	e13	e9.4	e20.0	25	29	45	18	25	4.1	3.7
25	48	24	e16	e9.6	e15	22	29	43	42	24	4.2	3.4
26	45	e20	e20	e9.3	e13	20	25	40	44	23	4.3	3.8
27	38	e12	e15	e8.1	e15.0	20	22	39	27	38	4.4	3.7
28	38	e18	e19	e9.2	e19	21	21	33	26	33	4.3	3.8
29	40	e23	e21	e9.7	---	20	21	30	24	24	4.4	3.8
30	44	e19	e21	e11	---	18	63	29	21	22	4.1	3.6
31	42	---	e18	e12	---	18	---	29	---	21	5.1	---
TOTAL	2,049	845	615.7	338.3	404.0	1,116.0	719	2,068	823	983	300.2	209.0
MEAN	66.1	28.2	19.9	10.9	14.4	36.0	24.0	66.7	27.4	31.7	9.68	6.97
MAX	407	39	33	16	28	160	63	288	44	120	22	36
MIN	20	12	5.7	8.0	10	10	14	29	18	17	4.1	3.4
AC-FT	4,060	1,680	1,220	671	801	2,210	1,430	4,100	1,630	1,950	595	415
CFSM	0.67	0.29	0.20	0.11	0.15	0.37	0.24	0.68	0.28	0.32	0.10	0.07
IN.	0.78	0.32	0.23	0.13	0.15	0.42	0.27	0.78	0.31	0.37	0.11	0.08

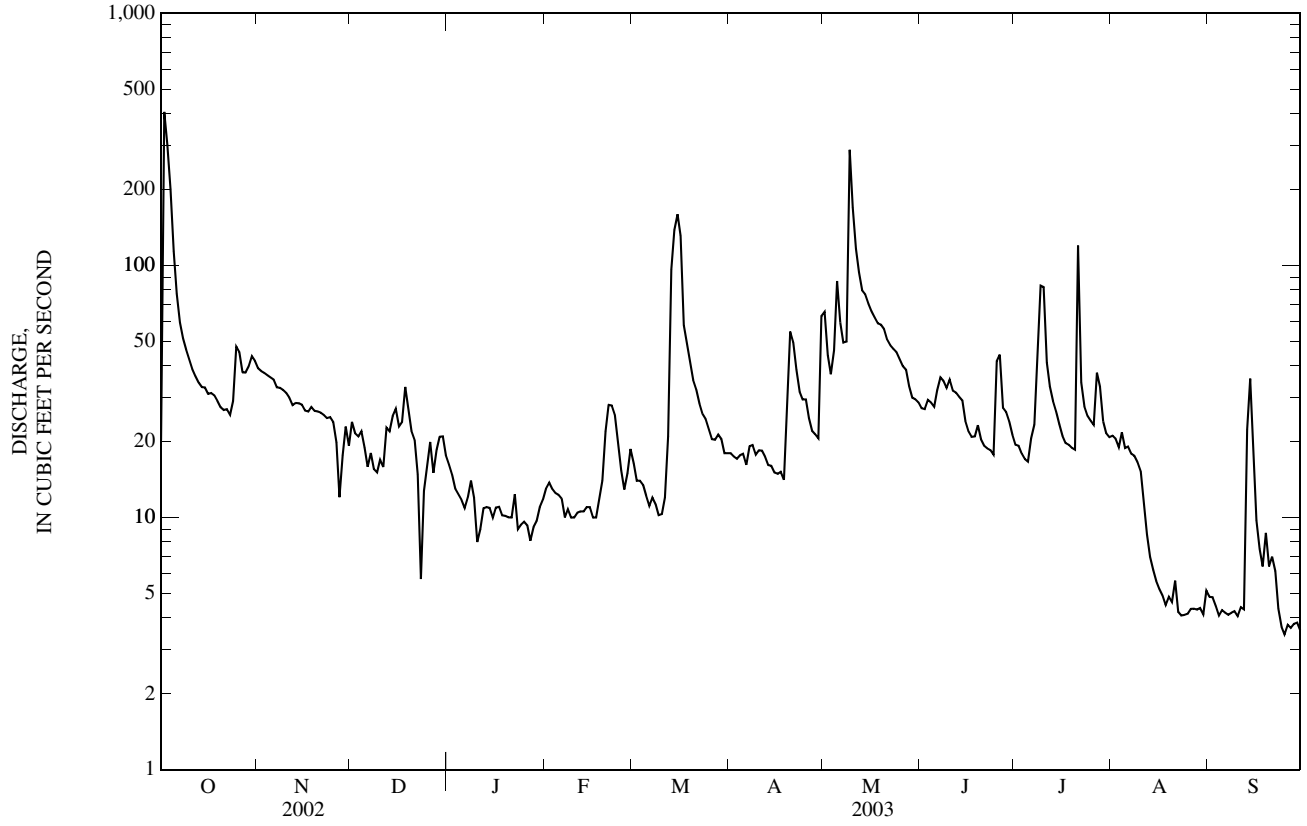
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2003, BY WATER YEAR (WY)

MEAN	33.8	43.7	37.5	38.4	72.0	110	101	111	106	88.9	58.5	41.6
MAX	261	246	162	206	243	402	452	589	566	991	759	337
(WY)	(1999)	(1962)	(1993)	(1960)	(2001)	(1979)	(1973)	(1974)	(1990)	(1993)	(1993)	(1965)
MIN	0.55	0.95	0.54	0.10	2.79	4.49	4.15	3.79	0.83	1.69	1.94	0.69
(WY)	(1958)	(1956)	(1956)	(1977)	(1954)	(1954)	(1956)	(1956)	(1956)	(1954)	(1953)	(1953)

05454300 CLEAR CREEK NEAR CORALVILLE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1953 - 2003	
ANNUAL TOTAL	17,693.6		10,470.2			
ANNUAL MEAN	48.5		28.7		70.1	
HIGHEST ANNUAL MEAN					327	1993
LOWEST ANNUAL MEAN					6.57	1957
HIGHEST DAILY MEAN	725	Aug 23	407	Oct 2	7,310	Jun 17, 1990
LOWEST DAILY MEAN	5.7	Dec 23	3.4	Sep 25	0.00	Jan 18, 1977
ANNUAL SEVEN-DAY MINIMUM	9.2	Sep 24	3.7	Sep 24	0.00	Jan 18, 1977
MAXIMUM PEAK FLOW			632	Oct 2	10,200	Jun 17, 1990
MAXIMUM PEAK STAGE			6.96	Mar 13a	16.36	Jun 17, 1990
INSTANTANEOUS LOW FLOW			3.1	Sep 25b		
ANNUAL RUNOFF (AC-FT)	35,100		20,770		50,790	
ANNUAL RUNOFF (CFSM)	0.49		0.29		0.71	
ANNUAL RUNOFF (INCHES)	6.71		3.97		9.71	
10 PERCENT EXCEEDS	98		49		146	
50 PERCENT EXCEEDS	31		21		27	
90 PERCENT EXCEEDS	14		5.6		3.1	

a Ice affected
b Also Sept. 26, 27, 29.
e Estimated



05454500 IOWA RIVER AT IOWA CITY, IA

LOCATION.--Lat 41°39'24", long 91°32'27", in SE¼ SE¼ sec.9, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 25 ft downstream from Hydraulics Laboratory of University of Iowa in Iowa City, 175 ft downstream from University Dam, 0.8 mi upstream from Ralston Creek, 3.6 mi downstream from Clear Creek, and at mile 74.2.

DRAINAGE AREA.--3,271 mi^2.

PERIOD OF RECORD.--June 1903 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 29.00 ft above Iowa City datum, and 617.27 ft above NGVD of 1929. Oct. 1, 1934 to Sept. 30, 1972, at datum 10.00 ft higher. See WSP 1708 for history of changes prior to Oct. 1, 1934.

REMARKS.--Records good. Slight fluctuation at low stages caused by powerplant above station. Flow regulated by Coralville Lake (station 05453510), 9.1 mi upstream, since Sept. 17, 1958. U.S. Army Corps of Engineers raingage and satellite data collection platform and U.S. Geological Survey data collection platform with telephone modem backup at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,500 ft^3/s June 8, 1918, gage height, 19.6 ft, from graph based on gage readings, site and datum then in use; minimum daily discharge, 29 ft^3/s Oct. 21, 22, 1916, regulated.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 17, 1881, reached a stage of 21.1 ft, from floodmarks at site and datum in use 1913-21, from information by local resident, discharge, 51,000 ft^3/s. Maximum stage known since at least 1850, about 3 ft higher than that of July 17, 1881, occurred in June 1851, discharge, 70,000 ft^3/s, estimated

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	650	1,180	717	551	235	478	594	1,910	2,540	2,900	1,480	331
2	1,260	1,090	639	560	268	474	573	2,410	2,510	2,920	1,370	300
3	2,400	1,080	578	551	334	459	565	3,380	2,500	2,930	1,230	286
4	3,390	964	820	554	351	424	594	4,510	2,410	2,800	1,060	275
5	2,280	806	765	556	352	418	654	5,100	2,190	2,670	774	270
6	1,390	724	1,440	554	348	470	677	4,720	2,130	2,540	760	250
7	1,340	556	1,560	553	343	622	693	4,350	2,130	2,400	880	238
8	1,410	468	1,600	562	342	672	707	4,820	2,140	2,540	865	230
9	1,640	599	1,640	630	342	603	736	6,000	2,190	2,930	770	190
10	1,880	922	1,630	716	341	583	813	6,140	2,460	3,770	696	159
11	2,030	1,080	1,630	619	311	586	751	6,050	2,760	4,720	701	145
12	2,030	1,080	1,510	462	260	678	701	6,030	3,090	4,870	755	137
13	2,020	1,020	1,260	419	259	1,240	694	6,060	3,230	4,570	750	161
14	1,960	916	1,000	421	262	1,640	690	6,110	3,230	4,450	684	380
15	1,880	912	789	418	264	1,810	690	6,180	3,180	4,770	662	516
16	1,820	914	787	417	259	1,880	797	6,010	3,080	4,910	618	367
17	1,660	915	786	422	262	2,160	992	6,040	2,930	4,810	600	282
18	1,410	915	822	401	265	2,730	1,000	6,040	2,660	4,400	580	215
19	1,220	914	812	378	268	2,530	1,080	5,990	2,360	3,890	495	199
20	1,170	942	796	357	275	1,930	1,320	6,000	1,950	3,440	434	177
21	1,110	995	793	333	293	1,780	1,600	6,020	1,970	3,450	423	158
22	1,110	992	787	334	425	1,520	1,670	6,020	2,070	3,090	411	157
23	1,110	949	778	318	e494	1,150	1,590	6,000	1,890	2,660	398	148
24	1,120	927	696	278	465	898	1,550	5,930	1,020	2,190	396	145
25	1,200	934	512	256	499	733	1,740	5,650	1,980	2,050	400	139
26	1,260	850	387	252	549	720	1,810	5,280	2,300	2,010	396	138
27	1,340	755	343	255	548	718	1,800	4,920	2,350	2,080	385	140
28	1,300	697	344	242	516	717	1,780	4,600	2,340	2,210	380	140
29	1,250	669	347	213	---	709	1,700	4,230	2,440	2,210	381	142
30	1,250	700	433	215	---	695	1,730	3,840	2,770	1,950	375	142
31	1,250	---	556	223	---	680	---	3,090	---	1,580	363	---
TOTAL	48,140	26,465	27,557	13,020	9,730	32,707	32,291	159,430	72,800	98,710	20,472	6,557
MEAN	1,553	882	889	420	348	1,055	1,076	5,143	2,427	3,184	660	219
MAX	3,390	1,180	1,640	716	549	2,730	1,810	6,180	3,230	4,910	1,480	516
MIN	650	468	343	213	235	418	565	1,910	1,020	1,580	363	137
AC-FT	95,490	52,490	54,660	25,830	19,300	64,870	64,050	316,200	144,400	195,800	40,610	13,010
CFSM	0.47	0.27	0.27	0.13	0.11	0.32	0.33	1.57	0.74	0.97	0.20	0.07
IN.	0.55	0.30	0.31	0.15	0.11	0.37	0.37	1.81	0.83	1.12	0.23	0.07

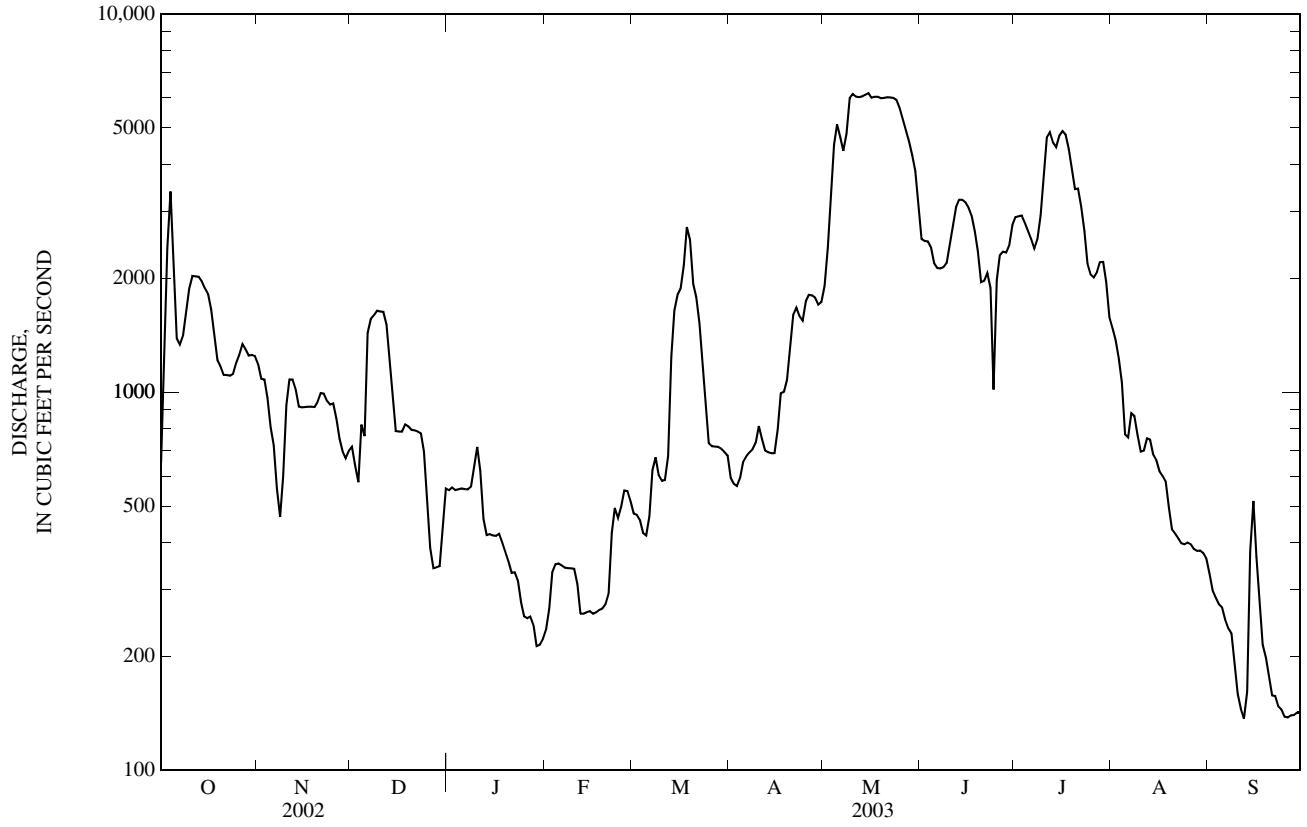
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	1,142	1,416	1,397	1,034	1,724	3,325	3,705	3,318	3,633	3,471	2,153	1,405
MAX	4,277	5,395	4,580	5,381	5,789	7,988	9,764	9,763	11,590	22,220	20,060	13,760
(WY)	(1994)	(1987)	(1983)	(1973)	(1973)	(1971)	(1979)	(1993)	(1991)	(1993)	(1993)	(1993)
MIN	135	121	130	141	125	366	348	184	99.1	72.8	162	147
(WY)	(1990)	(1967)	(1989)	(1990)	(1977)	(1977)	(1989)	(1977)	(1977)	(1977)	(1989)	(1976)

05454500 IOWA RIVER AT IOWA CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003a	
ANNUAL TOTAL	483,819		547,879			
ANNUAL MEAN	1,326		1,501		2,312	
HIGHEST ANNUAL MEAN					8,502	1993
LOWEST ANNUAL MEAN					304	1989
HIGHEST DAILY MEAN	4,500	Jun 16	6,180	May 15	26,200	Jul 21, 1993
LOWEST DAILY MEAN	237	Feb 5	137	Sep 12	49	Aug 1, 1977b
ANNUAL SEVEN-DAY MINIMUM	354	Feb 3	141	Sep 24	50	Jul 31, 1977
MAXIMUM PEAK FLOW			6,310	May 15	28,200	Aug 10, 1993
MAXIMUM PEAK STAGE			16.38	May 15	28.52	Aug 10, 1993
ANNUAL RUNOFF (AC-FT)	959,700		1,087,000		1,675,000	
ANNUAL RUNOFF (CFSM)	0.41		0.46		0.71	
ANNUAL RUNOFF (INCHES)	5.50		6.23		9.60	
10 PERCENT EXCEEDS	2,420		3,800		5,980	
50 PERCENT EXCEEDS	1,130		865		1,280	
90 PERCENT EXCEEDS	467		267		219	

a Post regulation.
b Also Aug. 2, 1977.
e Estimated.



05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IA

LOCATION.--Lat 41°39'05", long 91°30'27", in SW¼ NE¼ sec.14, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 60 ft downstream from bridge on Muscatine Avenue in Iowa City, and 1.2 mi upstream from mouth.

DRAINAGE AREA.--2.94 mi^2.

PERIOD OF RECORD.--Discharge records from October 1963 to September 1995. Stage-only records from October 29, 1996 to current year.

REVISED RECORDS.--WDR IA-66-1: Drainage area.

GAGE.--Records good except those for Nov. 11, Jan. 28, Feb. 28 to Mar. 16, and Sept. 13. Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 678.03 ft above NGVD of 1929.

REMARKS.--Minor regulation from retention dam 2 miles upstream may affect peaks. U.S. Geological Survey data collection platform with telephone modem at station.

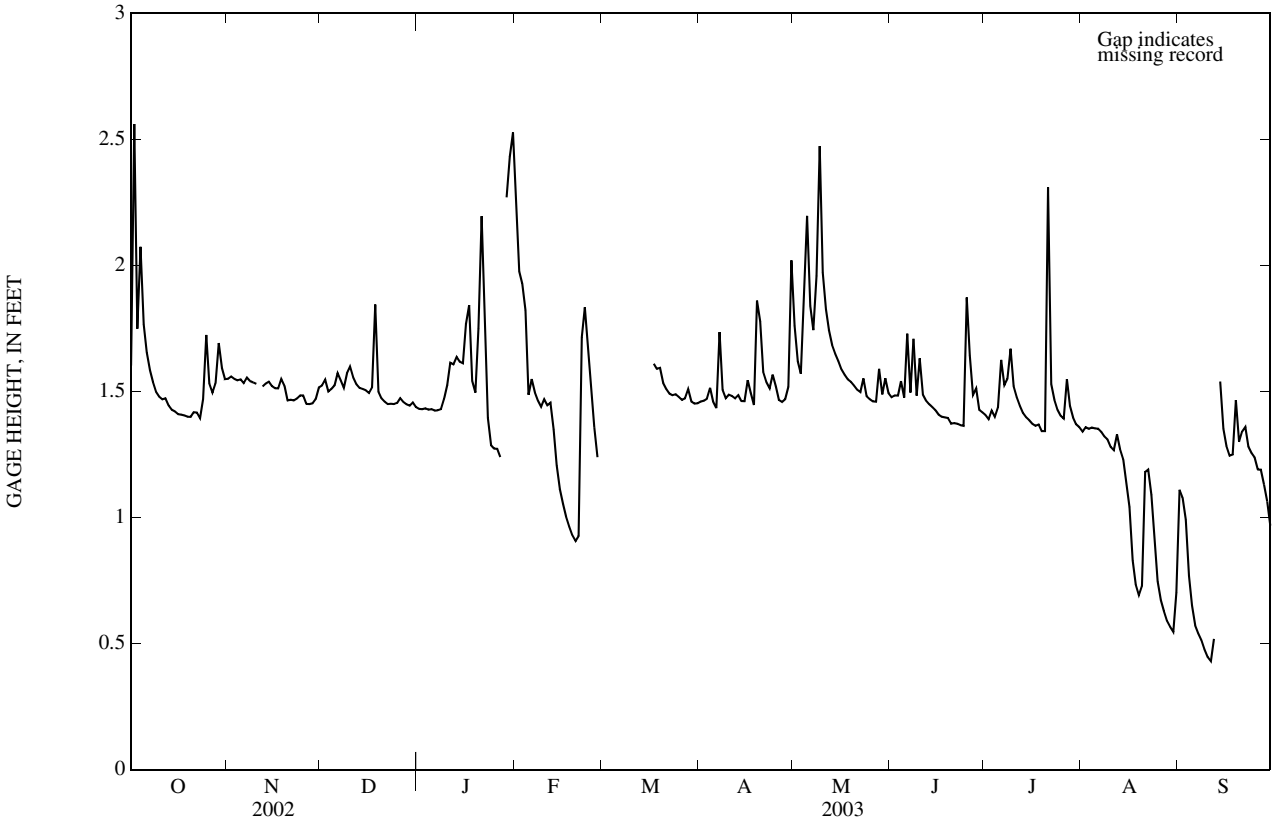
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 14, 1962, reached a stage of 10.5 ft, from flood profile, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum instantaneous gage height 7.35 ft on July 21. Minimum gage height of 0.43 ft. Sept. 10-12.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.60	1.55	1.52	1.43	2.27	---	1.46	1.76	1.48	1.41	1.34	1.11
2	2.56	1.56	1.55	1.43	1.98	---	1.46	1.62	1.48	1.39	1.36	1.08
3	1.75	1.55	1.50	1.43	1.93	---	1.47	1.57	1.48	1.42	1.35	0.99
4	2.07	1.54	1.51	1.43	1.82	---	1.51	1.91	1.54	1.40	1.36	0.77
5	1.77	1.55	1.52	1.43	1.49	---	1.46	2.20	1.48	1.44	1.35	0.65
6	1.66	1.53	1.57	1.42	1.55	---	1.43	1.84	1.73	1.63	1.35	0.57
7	1.58	1.56	1.54	1.43	1.50	---	1.74	1.74	1.50	1.52	1.34	0.54
8	1.54	1.54	1.51	1.43	1.46	---	1.51	1.96	1.71	1.55	1.32	0.51
9	1.50	1.54	1.57	1.47	1.44	---	1.47	2.47	1.48	1.67	1.31	0.48
10	1.48	1.53	1.60	1.53	1.47	---	1.49	1.97	1.63	1.52	1.28	0.45
11	1.47	---	1.56	1.61	1.45	---	1.48	1.83	1.49	1.48	1.27	0.43
12	1.47	1.52	1.53	1.61	1.46	---	1.47	1.74	1.46	1.44	1.33	0.52
13	1.44	1.53	1.51	1.64	1.35	---	1.49	1.68	1.45	1.41	1.27	---
14	1.43	1.54	1.51	1.62	1.21	---	1.46	1.65	1.44	1.40	1.23	1.54
15	1.42	1.52	1.50	1.61	1.11	---	1.46	1.62	1.43	1.39	1.14	1.35
16	1.41	1.51	1.49	1.77	1.05	---	1.54	1.59	1.41	1.37	1.04	1.28
17	1.41	1.51	1.52	1.84	1.00	1.61	1.49	1.57	1.40	1.36	0.83	1.25
18	1.41	1.55	1.85	1.54	0.96	1.59	1.45	1.55	1.40	1.37	0.73	1.25
19	1.40	1.52	1.50	1.50	0.93	1.59	1.86	1.54	1.40	1.34	0.69	1.47
20	1.40	1.46	1.47	1.75	0.91	1.53	1.78	1.52	1.37	1.34	0.73	1.30
21	1.42	1.47	1.46	2.20	0.93	1.51	1.58	1.51	1.37	2.31	1.18	1.34
22	1.42	1.46	1.45	1.73	1.72	1.49	1.54	1.50	1.37	1.53	1.19	1.36
23	1.39	1.47	1.45	1.40	1.83	1.49	1.51	1.55	1.37	1.47	1.09	1.28
24	1.47	1.48	1.45	1.29	1.69	1.49	1.57	1.48	1.36	1.43	0.94	1.26
25	1.72	1.48	1.45	1.27	1.51	1.48	1.52	1.47	1.87	1.40	0.75	1.24
26	1.53	1.45	1.47	1.27	1.36	1.47	1.47	1.46	1.64	1.39	0.67	1.19
27	1.50	1.45	1.46	1.24	1.24	1.47	1.46	1.46	1.49	1.55	0.63	1.19
28	1.53	1.45	1.45	---	---	1.51	1.47	1.59	1.51	1.44	0.59	1.13
29	1.69	1.47	1.44	2.27	---	1.46	1.52	1.49	1.43	1.40	0.57	1.06
30	1.59	1.52	1.46	2.43	---	1.45	2.02	1.55	1.42	1.37	0.55	0.97
31	1.55	---	1.44	2.53	---	1.45	---	1.49	---	1.36	0.70	---
MEAN	1.57	---	1.51	---	---	---	1.54	1.67	1.49	1.47	1.05	---
MAX	2.56	---	1.85	---	---	---	2.02	2.47	1.87	2.31	1.36	---
MIN	1.39	---	1.44	---	---	---	1.43	1.46	1.36	1.34	0.55	---

05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IA—Continued



05455100 OLD MANS CREEK NEAR IOWA CITY, IA

LOCATION.--Lat. 41°36'23", long. 91°36'56", in SE¼ SW¼ NW¼ sec.36, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank 10 ft downstream from bridge on county highway W62, 5 miles southwest of Iowa City, 5.9 miles upstream of Dirty Face Creek, and 8.6 miles upstream from mouth.

DRAINAGE AREA.--201 mi^2.

PERIOD OF RECORD.--October 1950 to September 1964, published in WSP 1914. Annual maximum, water years 1965-84. Occasional low-flow measurements, water years 1964-77; October 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 637.49 ft above NGVD of 1929. Prior to Nov. 16, 1984, nonrecording gage at same site at datum 2.00 ft higher. Prior to Oct. 1, 1987, at datum 2.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

COOPERATION.--Gage height record and discharge measurements for water years 1951-64 were collected by the U.S. Army Corps of Engineers and computed by the U.S. Geological Survey.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 13,500 ft^3/s, on the basis of contracted-opening of peak flow, June 15, 1982, gage height, 17.25 ft, present datum.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.5	55	e29	e19	e12	e20	20	124	41	40	35	4.6
2	491	54	e26	e17	e13	e17	19	95	42	39	19	4.4
3	588	54	e26	e15	e13	e17	18	78	46	37	16	4.1
4	273	50	e29	e14	e12	e16	20	81	46	34	15	3.6
5	182	49	e26	e12	e12	e16	20	203	42	32	16	3.5
6	122	47	e23	e11	e11	e15	20	139	44	30	13	3.5
7	96	45	e25	e11	e9.5	e16	21	115	63	30	12	3.5
8	81	43	e23	e13	e10	e14	22	108	61	37	11	3.5
9	72	45	e22	e11	e9.3	e14	23	539	68	130	10	3.7
10	62	43	e24	e6.8	e9.6	e15	22	356	68	154	9.3	3.4
11	56	41	e23	e8.1	e9.8	e28	23	249	64	78	8.8	3.4
12	50	38	e30	e10	e10	e96	24	192	55	55	8.3	3.4
13	48	36	e29	e10	e10	e147	23	159	52	46	8.2	6.0
14	45	37	34	e10	e9.4	e169	19	145	71	41	7.5	29
15	43	38	29	e8.8	e9.0	168	18	131	86	38	7.3	33
16	42	36	27	e9.7	e10	151	18	117	63	38	6.9	12
17	40	36	25	e9.8	e9.4	114	19	107	55	31	6.6	6.9
18	40	36	30	e9.1	e9.4	79	19	98	52	29	6.3	5.8
19	37	36	34	e8.9	e15	67	23	93	56	36	5.9	5.7
20	35	34	28	e8.7	e26	53	62	85	50	30	5.8	5.2
21	32	34	21	e8.6	e31	46	82	77	44	35	5.8	6.1
22	32	33	e18	e11	e32	40	60	74	42	26	6.0	5.5
23	31	31	e10	e8.1	e28	34	49	72	40	22	5.5	5.3
24	32	31	e18	e8.3	e22	31	44	69	37	21	5.1	5.4
25	45	30	e22	e8.7	e19	29	48	65	44	20	4.7	4.7
26	57	e24	e24	e8.1	e16	26	44	61	82	17	4.4	4.8
27	50	e19	e21	e6.6	e17	25	38	54	60	20	4.2	4.3
28	44	e25	24	e8.0	e21	25	35	51	48	28	4.4	4.4
29	46	e29	25	e8.9	---	24	34	50	52	24	4.4	4.4
30	51	e25	26	e10	---	22	73	47	44	18	4.2	4.5
31	57	---	e22	e11	---	21	---	45	---	20	4.4	---
TOTAL	2,889.5	1,134	773	320.2	415.4	1,555	960	3,879	1,618	1,236	281.0	197.6
MEAN	93.2	37.8	24.9	10.3	14.8	50.2	32.0	125	53.9	39.9	9.06	6.59
MAX	588	55	34	19	32	169	82	539	86	154	35	33
MIN	9.5	19	10	6.6	9.0	14	18	45	37	17	4.2	3.4
AC-FT	5,730	2,250	1,530	635	824	3,080	1,900	7,690	3,210	2,450	557	392
CFSM	0.46	0.19	0.12	0.05	0.07	0.25	0.16	0.62	0.27	0.20	0.05	0.03
IN.	0.53	0.21	0.14	0.06	0.08	0.29	0.18	0.72	0.30	0.23	0.05	0.04

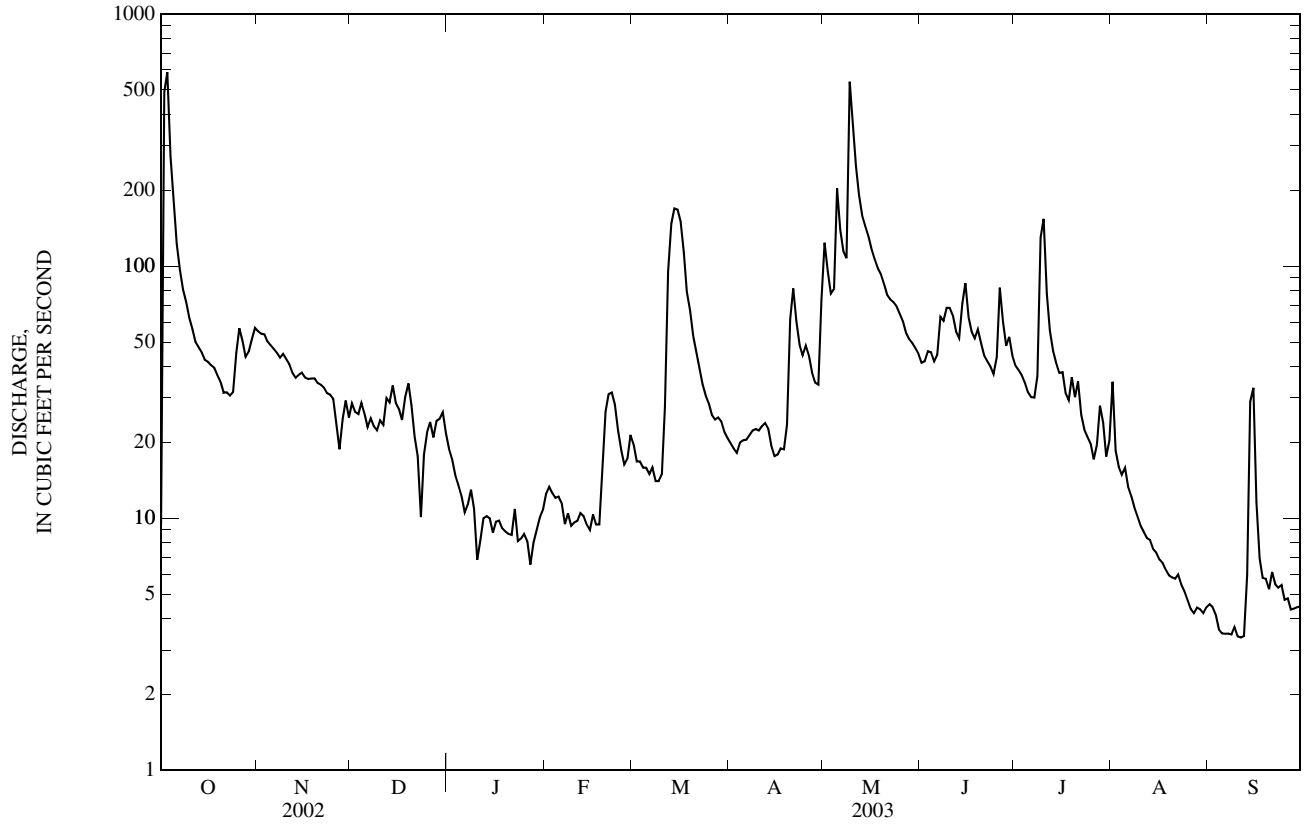
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 2003, BY WATER YEAR (WY)

MEAN	62.1	89.0	53.1	59.7	124	237	168	232	192	149	100	58.3
MAX	541	636	337	436	536	793	625	1,071	907	1,515	1,190	598
(WY)	(1999)	(1962)	(1993)	(1960)	(2001)	(1962)	(1993)	(1996)	(1990)	(1993)	(1993)	(1993)
MIN	0.21	0.39	0.35	0.26	2.50	2.12	1.29	4.97	5.34	1.43	2.97	0.36
(WY)	(1958)	(1956)	(1956)	(1956)	(1954)	(1954)	(1956)	(1956)	(1956)	(1954)	(1988)	(1957)

05455100 OLD MANS CREEK NEAR IOWA CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1951 - 2003	
ANNUAL TOTAL	29,634.5		15,258.7			
ANNUAL MEAN	81.2		41.8		127	
HIGHEST ANNUAL MEAN					607	1993
LOWEST ANNUAL MEAN					10.3	1954
HIGHEST DAILY MEAN	821	May 12	588	Oct 3	8,780	Jul 6, 1993
LOWEST DAILY MEAN	5.6	Sep 30	3.4	Sep 10	0.10	Sep 6, 1957
ANNUAL SEVEN-DAY MINIMUM	6.3	Sep 24	3.5	Sep 6	0.10	Sep 6, 1957
MAXIMUM PEAK FLOW			908	Oct 3	13,000	Jul 6, 1993
MAXIMUM PEAK STAGE			7.78	Oct 3	17.61	Jul 6, 1993
INSTANTANEOUS LOW FLOW			3.3	Sep 8a		
ANNUAL RUNOFF (AC-FT)	58,780		30,270		92,110	
ANNUAL RUNOFF (CFSM)	0.40		0.21		0.63	
ANNUAL RUNOFF (INCHES)	5.48		2.82		8.59	
10 PERCENT EXCEEDS	197		81		280	
50 PERCENT EXCEEDS	40		26		39	
90 PERCENT EXCEEDS	14		6.0		2.1	

a Also Sept. 10-12.
e Estimated.



05455500 ENGLISH RIVER AT KALONA, IA

LOCATION.--Lat 41°28'11", long 91°42'52",(revised) in SE¼ SE¼ sec.13, T.77 N., R.8 W., Washington County, Hydrologic Unit 07080209, on right bank 30 ft upstream from bridge on State Highway 1, 0.8 mi south of Kalona, 1.1 mi upstream from Camp Creek, 4.5 mi downstream from Smith Creek, and 14.5 mi upstream from mouth.

DRAINAGE AREA.--573 mi^2.

PERIOD OF RECORD.--September 1939 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1940 (M), 1941. WSP 1708: 1956, 1957 (P), 1958 (P).

GAGE.--Water-stage recorder. Datum of gage is 633.45 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers). Prior to Dec. 27, 1939, nonrecording gage 30 ft downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 19.9 ft, from floodmark, from information by local residents, discharge, 18,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	151	e61	e27	e19	e39	52	419	115	130	50	13
2	192	143	e57	e26	e21	e41	50	376	107	110	44	12
3	2,860	136	e57	e25	e20	e38	46	299	108	97	39	11
4	1,140	130	e60	e24	e21	e37	48	244	115	86	36	9.8
5	617	123	e57	e23	e21	e39	48	464	111	77	34	9.3
6	392	118	e54	e21	e20	e38	48	583	111	68	31	9.0
7	279	116	e57	e23	e19	e40	50	454	163	64	29	8.7
8	217	109	e53	e24	e19	e42	50	553	200	65	28	8.1
9	183	105	e52	e22	e18	e48	52	1,420	184	113	26	7.9
10	160	104	e53	e16	e18	e60	52	1,760	208	678	24	7.7
11	141	99	e51	e17	e19	e108	53	997	240	693	23	7.6
12	127	91	e57	e19	e21	e253	63	896	211	264	23	7.3
13	117	85	e54	e19	e20	e638	68	643	174	164	22	12
14	109	83	e56	e19	e20	e767	61	532	238	126	21	28
15	101	83	e57	e16	e20	e796	55	467	546	111	20	32
16	98	81	e51	e17	e20	e767	52	408	255	103	20	26
17	95	78	e52	e17	e19	e638	50	350	186	90	19	17
18	91	75	e59	e16	e23	424	52	309	156	81	18	13
19	89	77	e49	e16	e30	252	60	281	143	398	17	11
20	84	78	e42	e16	e42	177	96	256	128	314	16	9.5
21	78	77	e36	e16	e47	139	154	226	111	154	16	9.8
22	74	74	e31	e18	e48	112	148	206	100	117	16	9.8
23	71	71	e20	e14	e46	95	115	198	92	95	17	9.7
24	72	69	e26	e15	e37	83	101	190	83	80	16	10
25	82	e64	e30	e15	e33	78	103	178	82	69	14	12
26	104	e56	e34	e14	e34	71	115	165	120	62	14	12
27	139	e49	e28	e12	e36	64	112	150	279	61	14	12
28	124	e53	e31	e13	e42	63	99	139	205	56	13	11
29	114	e58	e33	e14	---	63	91	130	161	70	13	8.9
30	112	e55	e33	e16	---	62	154	125	171	72	12	8.0
31	131	---	e29	e16	---	56	---	118	---	60	12	---
TOTAL	8,223	2,691	1,420	566	753	6,128	2,298	13,536	5,103	4,728	697	363.1
MEAN	265	89.7	45.8	18.3	26.9	198	76.6	437	170	153	22.5	12.1
MAX	2,860	151	61	27	48	796	154	1,760	546	693	50	32
MIN	30	49	20	12	18	37	46	118	82	56	12	7.3
MED	114	82	52	17	21	71	57	309	158	95	20	9.9
AC-FT	16,310	5,340	2,820	1,120	1,490	12,150	4,560	26,850	10,120	9,380	1,380	720
CFSM	0.46	0.16	0.08	0.03	0.05	0.34	0.13	0.76	0.30	0.27	0.04	0.02
IN.	0.53	0.17	0.09	0.04	0.05	0.40	0.15	0.88	0.33	0.31	0.05	0.02

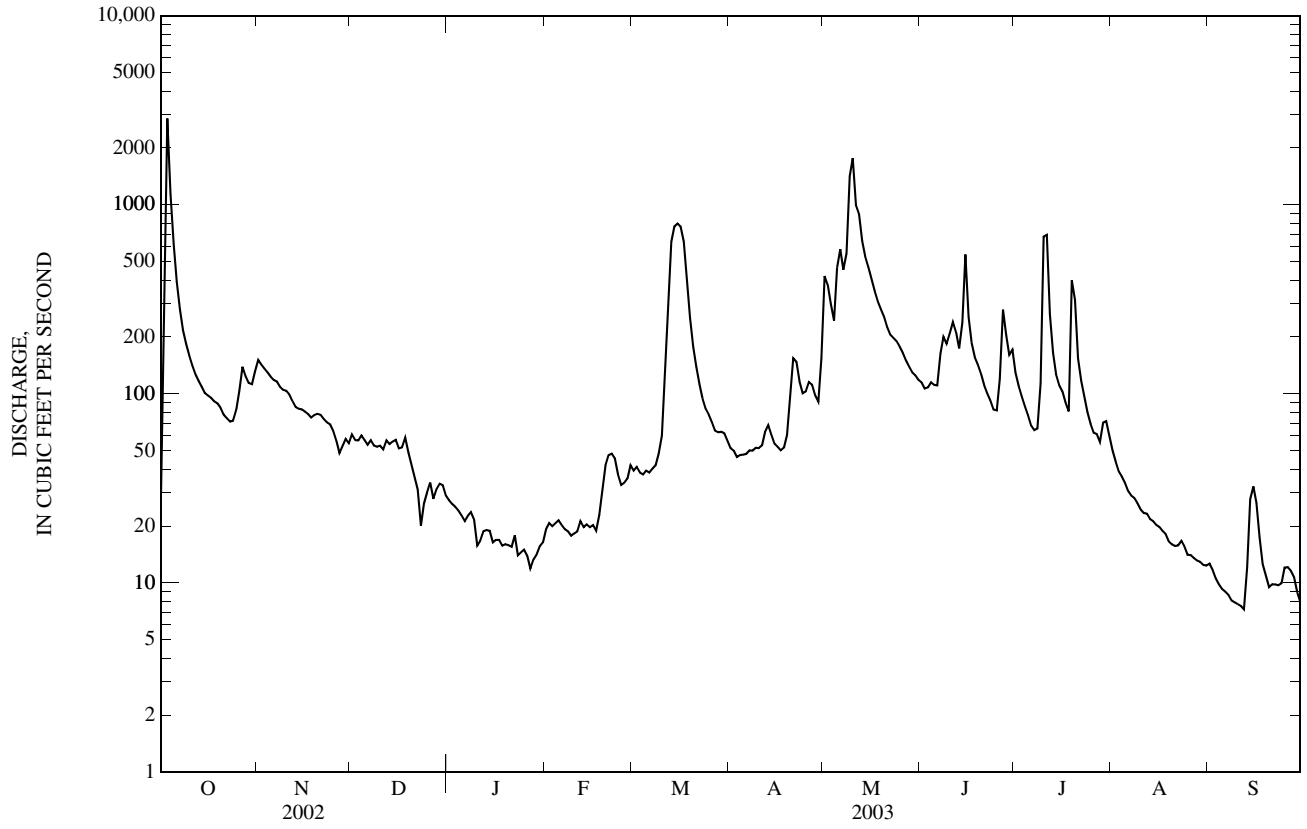
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

MEAN	163	243	180	203	361	687	632	685	595	402	263	225
MAX	1,274	2,060	1,085	1,429	1,066	2,957	2,736	3,529	2,570	4,207	3,696	3,169
(WY)	(1999)	(1962)	(1983)	(1946)	(1984)	(1979)	(1973)	(1974)	(1990)	(1993)	(1993)	(1965)
MIN	2.98	2.38	2.19	0.76	13.8	10.8	5.35	9.62	21.7	7.31	6.34	3.10
(WY)	(1954)	(1956)	(1956)	(1977)	(1954)	(1954)	(1956)	(1956)	(1940)	(1954)	(1955)	(1955)

05455500 ENGLISH RIVER AT KALONA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003	
ANNUAL TOTAL	82,171		46,506.1			
ANNUAL MEAN	225		127		386	
HIGHEST ANNUAL MEAN					1,721	1993
LOWEST ANNUAL MEAN					41.7	1954
HIGHEST DAILY MEAN	3,800	May 12	2,860	Oct 3	22,300	Jul 6, 1993
LOWEST DAILY MEAN	20	Dec 23	7.3	Sep 12	0.66	Feb 5, 1977
ANNUAL SEVEN-DAY MINIMUM	22	Sep 12	8.0	Sep 6	0.68	Feb 1, 1977
MAXIMUM PEAK FLOW			3,470	Oct 3	36,100	Jul 6, 1993
MAXIMUM PEAK STAGE			12.55	Oct 3	22.55	Jul 6, 1993
INSTANTANEOUS LOW FLOW			6.9	Sep 12		
ANNUAL RUNOFF (AC-FT)	163,000		92,240		279,900	
ANNUAL RUNOFF (CFSM)	0.39		0.22		0.67	
ANNUAL RUNOFF (INCHES)	5.33		3.01		9.14	
10 PERCENT EXCEEDS	573		259		860	
50 PERCENT EXCEEDS	85		60		118	
90 PERCENT EXCEEDS	34		14		12	

e Estimated



05455700 IOWA RIVER NEAR LONE TREE, IA

LOCATION.--Lat 41°25'15", long 91°28'25", in NW¼ NE¼ sec.6, T.76 N., R.5 W., Louisa County, Hydrologic Unit 07080209, on left bank 2,000 ft downstream from tri-county bridge on county highway W66, 5 mi southwest of Lone Tree, 6.2 mi downstream from English River, and at mile 47.2.

DRAINAGE AREA.--4,293 mi^2.

PERIOD OF RECORD.--October 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 588.16 ft above NGVD of 1929. Prior to Dec. 28, 1956, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Coralville Lake (station 05453510), 36.1 mi upstream, since Sept. 17, 1958. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 25, 1944, reached a stage of 19.94 ft, discharge not determined, from information by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	676	1,460	901	650	e281	e645	751	2,310	2,700	3,100	1,570	419
2	1,060	1,370	875	674	e325	e629	724	2,560	2,610	3,090	1,470	366
3	4,130	1,330	758	666	e382	639	714	3,480	2,580	3,150	1,330	347
4	5,400	1,310	867	651	e395	599	705	4,750	2,580	3,020	1,210	338
5	4,030	1,120	956	662	e394	e683	747	5,720	2,360	2,850	987	334
6	2,270	1,060	1,240	653	e390	e775	786	5,640	2,280	2,660	900	311
7	1,870	918	1,560	632	e385	e905	827	5,030	2,300	2,500	1,000	295
8	1,730	795	1,570	655	e383	691	822	5,280	2,390	2,530	1,010	289
9	1,840	750	1,650	654	e383	677	844	7,140	2,390	3,010	947	261
10	2,070	966	1,650	752	e380	694	852	8,800	2,610	4,000	859	225
11	2,300	1,220	1,640	e701	e371	596	969	7,510	2,950	5,480	841	195
12	2,310	1,240	1,630	e554	e331	666	851	7,130	3,330	5,440	885	197
13	2,270	1,230	1,420	e513	e300	1,750	846	6,860	3,510	4,960	889	234
14	2,240	1,120	1,240	e515	e302	3,250	852	6,740	3,500	4,660	819	477
15	2,110	1,080	1,000	e510	e304	2,950	849	6,750	3,750	4,850	793	493
16	2,070	1,070	932	e506	e302	2,770	846	6,520	3,550	5,060	748	405
17	1,920	1,070	927	e511	e306	2,750	1,040	6,470	3,300	5,040	726	306
18	1,700	1,080	965	e486	e308	3,360	1,060	6,440	3,020	4,720	714	249
19	1,440	1,070	985	e457	e312	3,090	1,100	6,330	2,640	4,210	613	246
20	1,370	1,060	946	e433	e323	2,360	1,310	6,310	2,210	4,160	535	228
21	1,290	1,130	935	e410	e375	2,010	1,580	6,290	2,090	3,880	516	217
22	1,260	1,130	901	e403	e946	1,830	1,730	6,270	2,160	3,460	493	233
23	1,250	1,120	860	e380	e1,500	1,430	1,690	6,230	2,200	3,060	482	216
24	1,270	1,070	e793	e342	e1,670	1,180	1,530	6,190	1,530	2,430	478	207
25	1,360	1,100	e634	e319	e1,000	948	1,670	5,930	1,700	2,130	473	203
26	1,390	1,040	e527	e309	e727	866	1,790	5,600	2,530	2,070	466	205
27	1,520	932	e485	e308	e699	844	1,790	5,200	2,520	2,080	455	205
28	1,530	874	492	e292	e673	846	1,770	4,890	2,610	2,220	452	202
29	1,460	851	487	e257	---	835	1,730	4,540	2,520	2,290	447	200
30	1,470	838	497	e264	---	823	1,800	4,180	2,870	2,110	439	196
31	1,450	---	615	e265	---	811	---	3,600	---	1,730	445	---
TOTAL	60,056	32,404	30,938	15,384	14,447	42,902	34,575	176,690	79,290	105,950	23,992	8,299
MEAN	1,937	1,080	998	496	516	1,384	1,152	5,700	2,643	3,418	774	277
MAX	5,400	1,460	1,650	752	1,670	3,360	1,800	8,800	3,750	5,480	1,570	493
MIN	676	750	485	257	281	596	705	2,310	1,530	1,730	439	195
AC-FT	119,100	64,270	61,370	30,510	28,660	85,100	68,580	350,500	157,300	210,200	47,590	16,460
CFSM	0.45	0.25	0.23	0.12	0.12	0.32	0.27	1.33	0.62	0.80	0.18	0.06
IN.	0.52	0.28	0.27	0.13	0.13	0.37	0.30	1.53	0.69	0.92	0.21	0.07

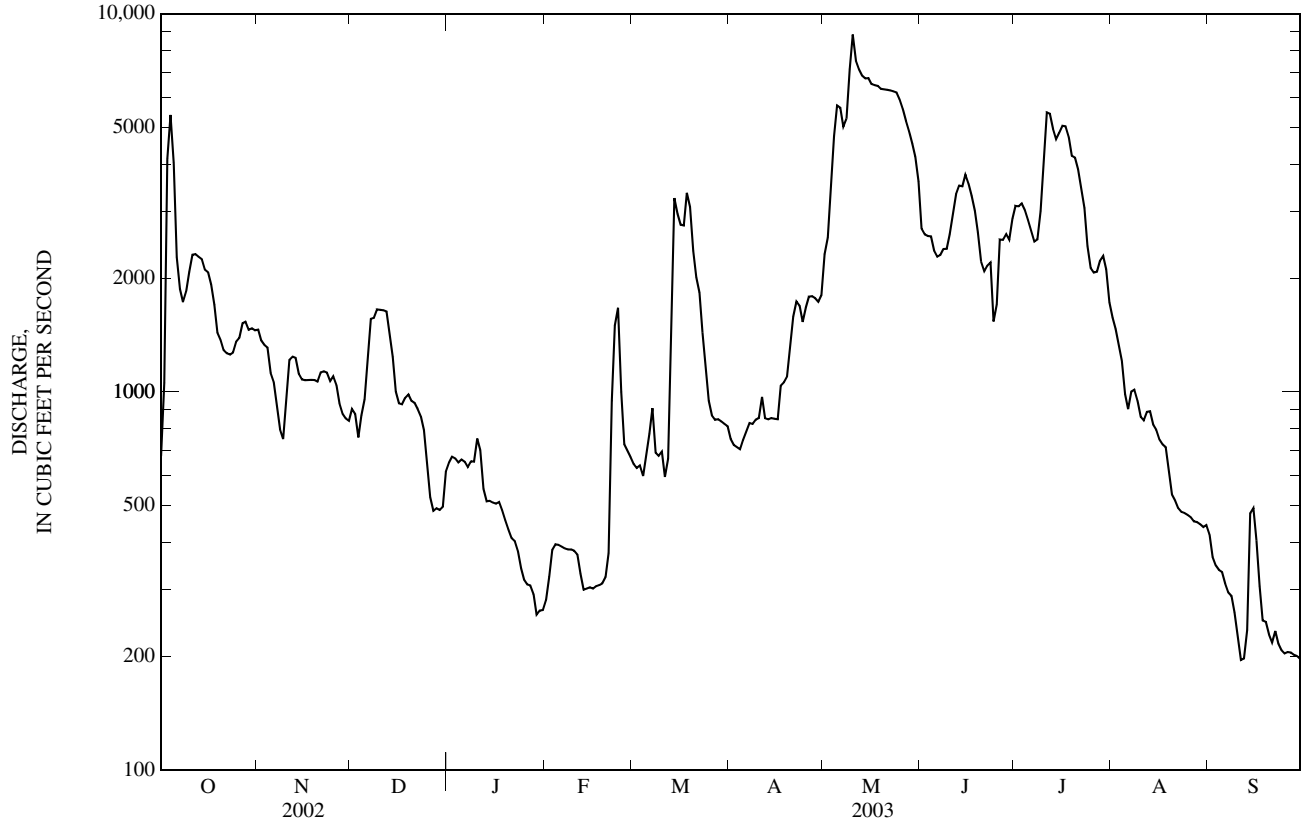
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	1,535	1,938	1,832	1,450	2,394	4,616	5,004	4,687	4,742	4,376	2,766	1,973
MAX	6,115	6,347	6,678	7,814	7,205	10,410	12,230	14,030	13,150	30,320	26,150	18,150
(WY)	(1994)	(1962)	(1983)	(1973)	(1973)	(1993)	(1979)	(1993)	(1974)	(1993)	(1993)	(1993)
MIN	192	190	168	154	158	539	533	282	147	180	186	210
(WY)	(1989)	(1967)	(1989)	(1977)	(1977)	(1977)	(1989)	(1977)	(1977)	(1977)	(1989)	(1988)

05455700 IOWA RIVER NEAR LONE TREE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003a	
ANNUAL TOTAL	630,542		624,927			
ANNUAL MEAN	1,728		1,712		3,111	
HIGHEST ANNUAL MEAN					11,900	1993
LOWEST ANNUAL MEAN					483	1989
HIGHEST DAILY MEAN	7,300	May 13	8,800	May 10	55,100	Jul 7, 1993
LOWEST DAILY MEAN	311	Feb 7	195	Sep 11	69	Aug 4, 1977
ANNUAL SEVEN-DAY MINIMUM	444	Sep 13	203	Sep 24	75	Jul 30, 1977
MAXIMUM PEAK FLOW			9,120	May 10	57,100	Jul 7, 1993
MAXIMUM PEAK STAGE			12.29	May 10	22.94	Jul 7, 1993
ANNUAL RUNOFF (AC-FT)	1,251,000		1,240,000		2,254,000	
ANNUAL RUNOFF (CFSM)	0.40		0.40		0.72	
ANNUAL RUNOFF (INCHES)	5.46		5.42		9.85	
10 PERCENT EXCEEDS	3,340		4,190		7,540	
50 PERCENT EXCEEDS	1,390		1,060		1,750	
90 PERCENT EXCEEDS	562		316		320	

a Post regulation.
e Estimated.



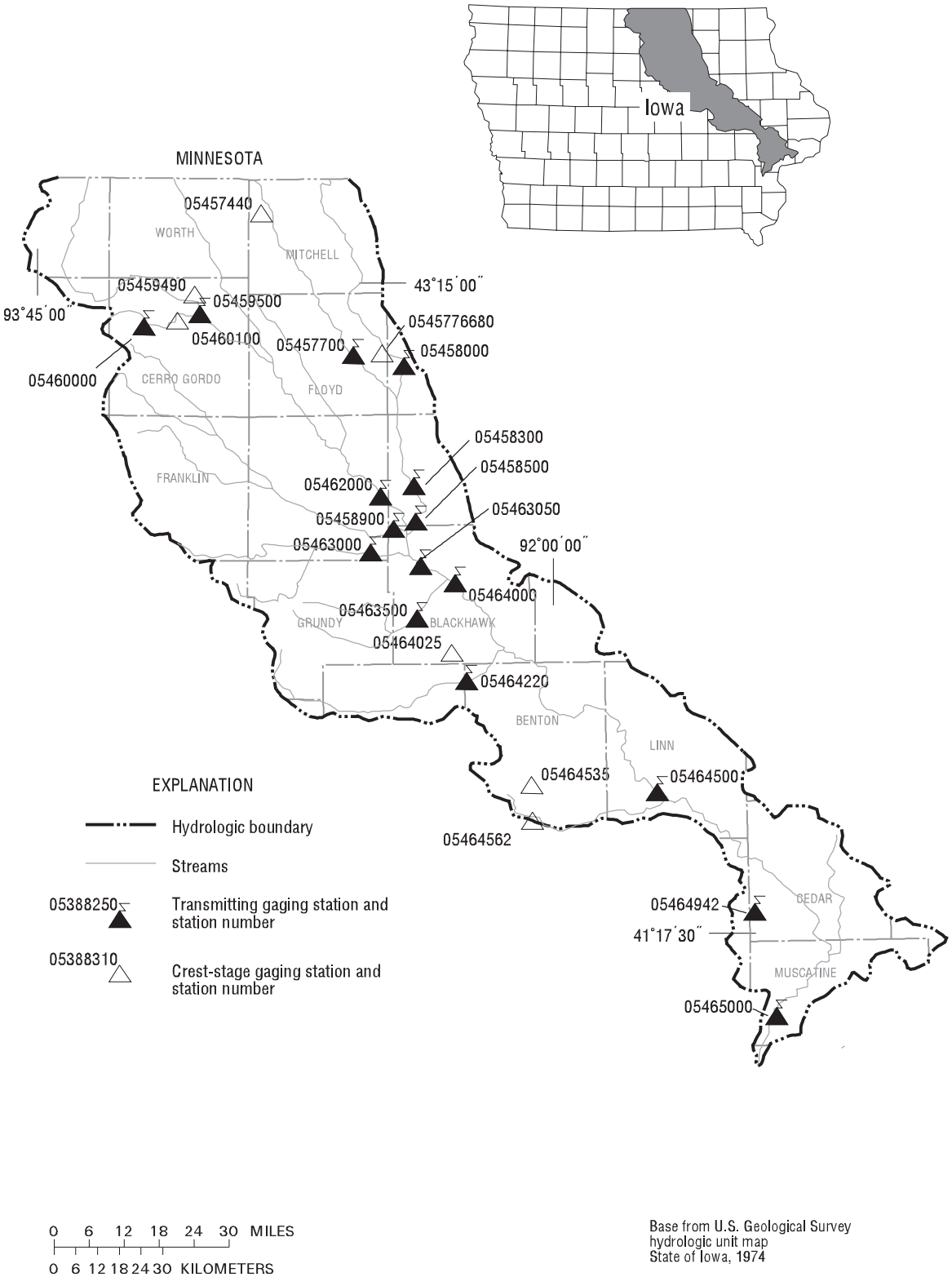


Figure 10. Locations of active continuous-record and crest-stage gaging stations in the Cedar River drainage basins.

Gaging Stations

05457700 Cedar River at Charles City, IA 172
05458000 Little Cedar River near Ionia, IA 174
05458300 Cedar River at Waverly, Ia 176
05458500 Cedar River at Janesville, IA 178
05458900 West Fork Cedar River at Finchford, IA 180
05459500 Winnebago River at Mason City, IA 182
05460000 Clear Lake at Clear Lake, IA 184
05462000 Shell Rock River at Shell Rock, IA 186
05463000 Beaver Creek at New Hartford, IA 188
05463050 Cedar River at Cedar Falls, Ia 190
05463500 Black Hawk Creek at Hudson, IA 192
05464000 Cedar River at Waterloo, IA 194
05464220 Wolf Creek near Dysart, IA 196
05464500 Cedar River at Cedar Rapids, IA 198
05464942 Hoover Creek at Hoover National Historic Site at West Branch, Ia 200
05465000 Cedar River near Conesville, IA 202

Crest Stage Gaging Stations

05457440 Deer Creek near Carpenter, IA 459
0545776680 Gizzard Creek Tributary near Bassett, IA 459
05459490 Spring Creek near Mason City, IA 459
05460100 Willow Creek near Mason City, IA 459
05464025 Miller Creek near Eagle Center, IA 459
05464535 Prairie Creek Tributary near Van Horne, IA 459
05464562 Thunder Creek at Blairstown, IA 460

05457700 CEDAR RIVER AT CHARLES CITY, IA

LOCATION.--Lat 43°03'45", long 92°40'23", in SE¼ NE¼, sec.12, T.95 N., R.16 W., Floyd County, Hydrologic Unit 07080201, on right bank 800 ft downstream from bridge on U.S. Highway 18 (Brantingham Street) in Charles City, 10.6 mi upstream from Gizzard Creek, and at mile 252.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,054 mi^2.

PERIOD OF RECORD.--Discharge records from October 1964 to September 1995; October 1, 2000 to current year. Stage-only records from October 1995 to September 2000.

GAGE.--Water-stage recorder. Datum of gage is 973.02 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform with telephone modem at station. Occasional minor regulation by dam 0.2 mi upstream from gage. Daily wire-weight gage readings available in district office for period Sept. 13, 1945 to June 30, 1954, at same site and datum. Discharge not published for this period because of extreme regulation of streamflow by power dam 0.2 mi upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 27, 1961, reached a stage of 21.6 ft, from flood marks, discharge, 29,200 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	218	340	194	202	e222	183	511	485	554	1,150	312	181
2	248	334	e203	e198	218	e171	444	459	520	1,010	288	180
3	258	332	172	194	216	177	402	422	501	869	277	180
4	369	331	204	202	e212	171	382	486	477	796	266	176
5	1,230	339	e198	e196	211	e158	371	1,180	457	778	266	173
6	951	352	e192	e193	200	171	340	2,310	535	733	268	175
7	1,180	348	e239	e191	e189	173	346	2,550	705	1,080	263	175
8	989	350	e232	e204	195	e167	342	2,270	1,240	2,590	260	172
9	912	346	220	e219	e194	e161	317	2,590	2,120	2,110	256	168
10	785	343	234	e196	e197	e160	339	3,350	2,070	2,660	250	161
11	696	343	267	140	e209	163	376	3,500	1,790	2,990	251	160
12	653	329	268	171	e203	170	495	4,630	1,580	1,930	240	184
13	621	324	251	e170	211	177	534	4,800	1,320	1,490	240	188
14	580	322	256	e168	222	230	513	3,750	1,150	1,190	230	197
15	506	324	261	e164	e218	254	501	3,060	1,090	1,050	228	188
16	514	316	247	e182	e213	332	524	3,300	937	1,090	221	185
17	494	306	248	e171	e215	484	582	2,510	849	957	219	176
18	476	303	283	180	222	525	685	2,000	783	831	209	183
19	460	303	308	176	215	442	756	1,730	726	726	206	204
20	437	306	294	e174	209	348	812	1,520	663	661	210	212
21	418	305	267	e171	227	314	938	1,280	611	622	203	207
22	404	297	236	e168	e242	290	994	1,170	569	583	200	196
23	386	299	212	e162	e238	272	922	1,050	544	532	195	186
24	381	293	165	166	e236	254	839	964	607	475	192	181
25	378	285	188	e163	e233	247	759	889	900	432	194	176
26	371	273	195	e157	241	254	680	811	1,560	407	208	183
27	368	245	e208	e167	209	275	620	741	1,820	389	267	183
28	369	261	e200	e189	191	340	566	690	1,690	360	220	179
29	362	e247	e195	e184	---	780	512	645	1,730	338	201	178
30	358	e259	e200	e198	---	879	500	625	1,390	322	192	177
31	352	---	e192	e208	---	659	---	596	---	310	183	---
TOTAL	16,724	9,355	7,029	5,624	6,008	9,381	16,902	56,363	31,488	31,461	7,215	5,464
MEAN	539	312	227	181	215	303	563	1,818	1,050	1,015	233	182
MAX	1,230	352	308	219	242	879	994	4,800	2,120	2,990	312	212
MIN	218	245	165	140	189	158	317	422	457	310	183	160
AC-FT	33,170	18,560	13,940	11,160	11,920	18,610	33,530	111,800	62,460	62,400	14,310	10,840
CFSM	0.51	0.30	0.22	0.17	0.20	0.29	0.53	1.73	1.00	0.96	0.22	0.17
IN.	0.59	0.33	0.25	0.20	0.21	0.33	0.60	1.99	1.11	1.11	0.25	0.19

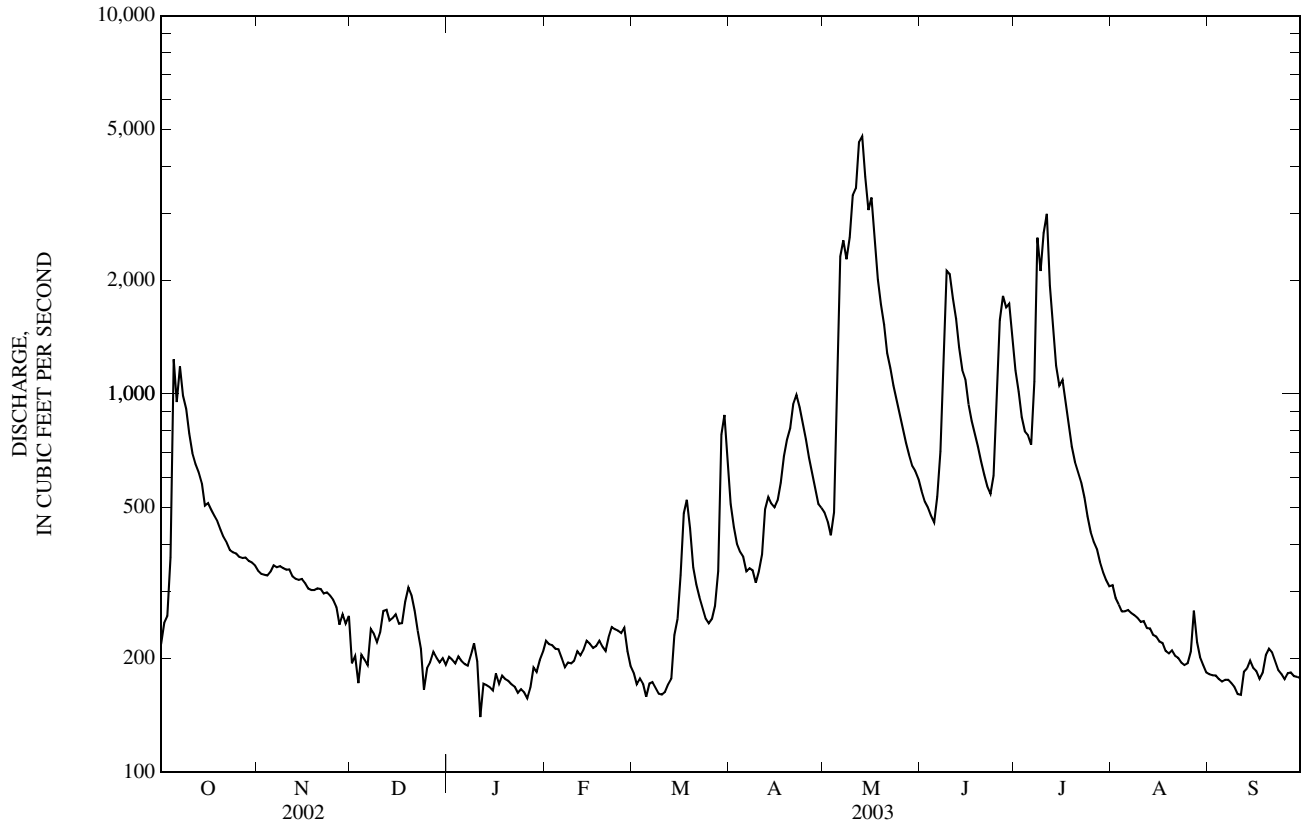
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2003, BY WATER YEAR (WY)

MEAN	564	492	357	278	372	1,243	1,573	1,076	1,025	812	665	506
MAX	2,339	1,639	1,396	888	1,707	3,388	6,010	3,434	4,071	3,009	4,704	1,670
(WY)	(1987)	(1983)	(1983)	(1973)	(1984)	(1997)	(2001)	(1991)	(1993)	(1993)	(1993)	(1965)
MIN	126	97.7	85.4	86.3	127	176	251	197	130	159	114	116
(WY)	(1977)	(1977)	(1990)	(1990)	(1990)	(1968)	(1968)	(1977)	(1977)	(1988)	(1988)	(1976)

05457700 CEDAR RIVER AT CHARLES CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1965 - 2003	
ANNUAL TOTAL	146,033		203,014			
ANNUAL MEAN	400		556		754	
HIGHEST ANNUAL MEAN					2,048	1993
LOWEST ANNUAL MEAN					159	1977
HIGHEST DAILY MEAN	2,240	Jun 6	4,800	May 13	22,100	Aug 17, 1993
LOWEST DAILY MEAN	127	Jan 2	140	Jan 11a	60	Nov 23, 1976b
ANNUAL SEVEN-DAY MINIMUM	148	Jan 10	165	Mar 5	65	Dec 17, 1989
MAXIMUM PEAK FLOW			5,000	May 12	31,200	Jul 21, 1999
MAXIMUM PEAK STAGE			8.08	May 12	22.81	Jul 21, 1999
INSTANTANEOUS LOW FLOW			102	Dec 1c	45	Nov 17, 1989
ANNUAL RUNOFF (AC-FT)	289,700		402,700		546,400	
ANNUAL RUNOFF (CFSM)	0.38		0.53		0.72	
ANNUAL RUNOFF (INCHES)	5.15		7.17		9.72	
10 PERCENT EXCEEDS	737		1,180		1,610	
50 PERCENT EXCEEDS	313		303		376	
90 PERCENT EXCEEDS	192		176		160	

a Ice affected.
b Also Jan. 7, 1978.
c Also Jan. 1.
e Estimated.



05458000 LITTLE CEDAR RIVER NEAR IONIA, IA

LOCATION.--Lat 43°02'05", long 92°30'05", in SW¼ NE¼ sec.21, T.95 N., R.14 W., Chickasaw County, Hydrologic Unit 07080201, on left bank 12 ft downstream from bridge on county highway B57, 2.4 mi west of Ionia, 6.4 mi upstream from mouth, and 7.6 mi downstream from Beaver Creek.

DRAINAGE AREA.--306 mi^2.

PERIOD OF RECORD.--October 1954 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1959.

GAGE.--Water-stage recorder. Datum of gage is 973.35 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1954, reached a stage of 11.37 ft, discharge, 4,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	48	26	33	19	e29	73	124	162	300	69	22
2	35	47	41	31	19	e26	66	119	153	280	62	23
3	52	47	29	27	e18	e29	61	111	146	266	58	22
4	76	48	38	31	e17	e30	59	116	140	261	54	22
5	104	48	34	e29	e16	e27	59	668	130	263	53	22
6	104	50	31	e28	e15	e30	57	708	153	259	53	21
7	100	49	32	e30	e12	32	60	683	223	330	52	21
8	89	49	30	e33	e19	e27	57	615	e300	1,020	49	20
9	80	49	27	e27	e15	e22	62	907	481	1,010	46	21
10	72	50	30	e17	e15	e25	66	838	567	946	43	20
11	67	50	30	e14	e18	28	94	742	508	1,130	42	19
12	64	47	34	e13	e14	27	128	918	418	797	41	24
13	60	46	36	e17	e17	25	139	797	363	582	39	24
14	57	47	36	e14	e20	27	135	627	319	466	39	23
15	55	46	38	e13	e18	39	127	708	277	390	37	22
16	53	45	36	e17	e16	58	126	719	248	343	36	22
17	52	43	38	e15	e17	88	146	571	224	300	34	20
18	52	44	45	e13	e19	135	154	473	205	254	32	21
19	51	45	51	e14	e18	166	165	410	189	214	31	26
20	49	45	49	e18	20	149	206	364	174	184	32	27
21	48	45	44	e17	e19	125	238	323	160	159	31	30
22	47	43	40	e15	e18	104	238	296	144	157	30	31
23	46	43	29	e13	e17	92	219	277	132	134	28	29
24	47	42	28	e18	e15	87	200	258	140	116	27	27
25	49	37	32	e15	e14	68	184	241	181	105	26	25
26	50	26	e29	e12	e26	61	169	224	265	95	28	24
27	49	29	e31	e13	32	64	155	210	330	86	26	25
28	50	40	e30	e16	e31	86	142	198	324	80	25	25
29	51	52	e30	e14	---	102	129	185	325	74	25	26
30	51	28	e31	e17	---	94	126	178	329	68	24	26
31	50	---	e26	18	---	82	---	169	---	66	23	---
TOTAL	1,840	1,328	1,061	602	514	1,984	3,840	13,777	7,710	10,735	1,195	710
MEAN	59.4	44.3	34.2	19.4	18.4	64.0	128	444	257	346	38.5	23.7
MAX	104	52	51	33	32	166	238	918	567	1,130	69	31
MIN	30	26	26	12	12	22	57	111	130	66	23	19
AC-FT	3,650	2,630	2,100	1,190	1,020	3,940	7,620	27,330	15,290	21,290	2,370	1,410
CFSM	0.19	0.14	0.11	0.06	0.06	0.21	0.42	1.45	0.84	1.13	0.13	0.08
IN.	0.22	0.16	0.13	0.07	0.06	0.24	0.47	1.67	0.94	1.31	0.15	0.09

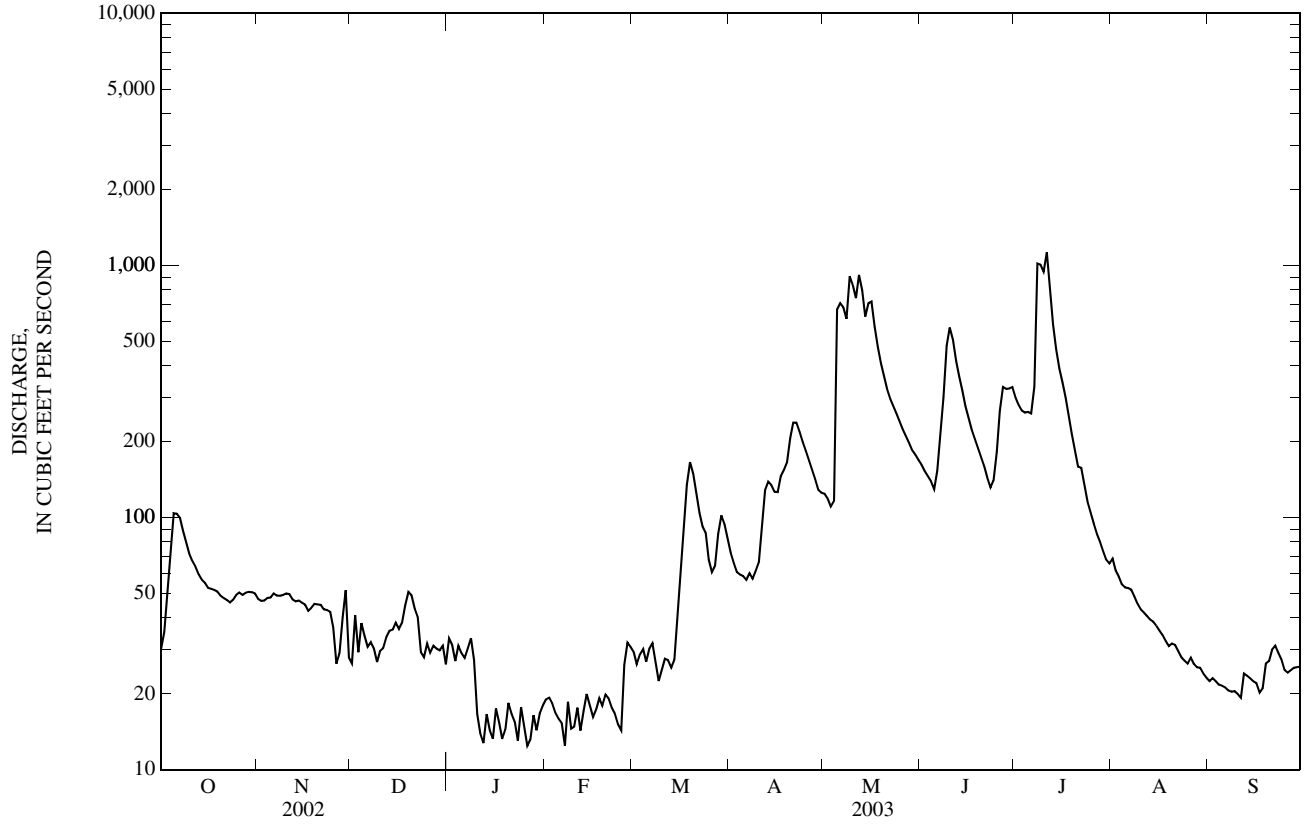
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 2003, BY WATER YEAR (WY)

MEAN	138	118	75.7	47.6	83.8	353	374	250	291	203	167	129
MAX	902	632	503	265	644	1,056	1,636	906	1,199	1,317	1,744	807
(WY)	(1987)	(1983)	(1983)	(1973)	(1984)	(1961)	(2001)	(1991)	(2000)	(1999)	(1993)	(1965)
MIN	9.64	12.4	4.93	4.20	3.40	34.5	47.3	30.5	18.4	14.2	7.23	12.7
(WY)	(1990)	(1990)	(1990)	(1959)	(1959)	(1964)	(1957)	(1958)	(1989)	(1964)	(1989)	(1988)

05458000 LITTLE CEDAR RIVER NEAR IONIA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1955 - 2003	
ANNUAL TOTAL	31,089		45,296			
ANNUAL MEAN	85.2		124		186	
HIGHEST ANNUAL MEAN					584	1993
LOWEST ANNUAL MEAN					32.0	1977
HIGHEST DAILY MEAN	426	Aug 6	1,130	Jul 11	9,930	Mar 27, 1961
LOWEST DAILY MEAN	21	Jan 18	12	Jan 26a	3.0	Feb 4, 1959b
ANNUAL SEVEN-DAY MINIMUM	26	Jan 30	14	Jan 23	3.0	Feb 3, 1959
MAXIMUM PEAK FLOW			1,220	Jul 8	14,000	Aug 16, 1993
MAXIMUM PEAK STAGE			6.61	May 9	18.99	Aug 16, 1993
INSTANTANEOUS LOW FLOW			11	Dec 1	3.0	Feb 4, 1959
ANNUAL RUNOFF (AC-FT)	61,670		89,840		134,900	
ANNUAL RUNOFF (CFSM)	0.28		0.41		0.61	
ANNUAL RUNOFF (INCHES)	3.78		5.51		8.27	
10 PERCENT EXCEEDS	192		321		389	
50 PERCENT EXCEEDS	52		48		72	
90 PERCENT EXCEEDS	30		18		20	

a Also Feb. 7; Ice affected.
b Also Feb. 5-9, 1959.
e Estimated.



05458300 CEDAR RIVER AT WAVERLY, IA

LOCATION.--Lat 42°44'14", long 92°28'12", in NE¼ NW¼ SW¼ sec.35, T.92 N., R.14 W., Butler County, Hydrologic Unit 07080201, in middle of the County Highway V-14 bridge on the north edge of Waverly.

DRAINAGE AREA.--1,547 mi^2.

PERIOD OF RECORD.--August 30, 2000 to current year.

GAGE.--Water-stage recorder. Datum of gage is 892.64 ft above NGVD of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	341	463	333	305	e239	e220	668	e748	e847	e1,430	e572	e328
2	e390	e428	335	298	e234	e212	608	e741	e898	e1,130	e557	e321
3	e530	e467	e310	275	e232	e221	535	e636	e808	e1,030	e536	e312
4	e330	e436	300	305	e227	e218	495	e644	e770	e980	e500	e302
5	e400	e425	297	e298	e225	e206	483	e1,040	e763	e1,060	e481	e302
6	e820	e431	287	e282	e216	e222	475	e2,170	e776	e1,020	e475	e291
7	e1,050	e449	333	e279	e208	e224	439	e2,840	e1,000	e1,100	e471	e290
8	e1,200	e445	314	e297	e215	e219	471	3,260	e1,380	e2,840	e563	e267
9	e1,040	e507	279	312	e213	e217	449	3,030	e2,140	e2,640	e454	e271
10	e1,050	e460	357	209	e217	e215	446	3,650	e2,110	e3,000	e316	e286
11	e890	468	375	181	e226	e221	484	4,150	1,970	e3,100	e438	e246
12	764	e406	e367	234	e221	e227	520	4,340	e1,720	e3,480	e432	e293
13	698	e418	e347	e226	e227	e240	605	5,550	e1,620	e2,040	e402	e340
14	640	430	346	e217	e238	e282	670	6,140	e1,410	e1,880	e402	e296
15	712	420	342	e210	e233	e320	670	5,080	e1,330	e1,790	e399	e308
16	571	391	329	e229	e227	e380	626	4,110	e1,260	1,700	e398	e290
17	631	e410	333	e217	e231	e428	628	4,480	1,160	1,710	e390	e296
18	576	424	360	e229	e237	501	691	3,390	1,130	1,530	e373	e276
19	592	e410	353	e221	e231	559	837	2,880	e1,090	e1,230	e362	e322
20	532	e412	e350	e220	e221	553	917	2,680	e1,020	e1,130	e354	e309
21	e559	423	e326	e218	e241	512	980	e2,140	e985	1,150	e353	e296
22	519	396	e302	e215	e252	487	1,120	e1,940	e915	884	e347	e326
23	e482	e403	e275	e210	e250	e420	1,190	e1,770	e871	902	e337	e313
24	510	372	251	e211	e248	e396	1,110	e1,700	890	788	e327	e279
25	e490	339	248	e204	e245	e377	1,100	e1,260	923	746	e311	e289
26	e503	e336	245	e190	e251	e356	e920	e1,340	e1,580	e717	e324	e263
27	e495	370	283	e198	e240	e366	e860	e1,200	e1,820	e710	e329	e274
28	e445	363	e306	e208	e226	405	e771	e1,120	e1,900	666	e408	e283
29	e441	e333	e288	e200	---	450	e718	e1,060	e1,830	e621	e310	e269
30	e500	345	e307	e210	---	761	e741	e981	e1,740	e608	e374	258
31	e488	---	e292	e225	---	874	---	e994	---	e553	e308	---
TOTAL	19,189	12,380	9,770	7,333	6,471	11,289	21,227	77,064	38,656	44,165	12,603	8,796
MEAN	619	413	315	237	231	364	708	2,486	1,289	1,425	407	293
MAX	1,200	507	375	312	252	874	1,190	6,140	2,140	3,480	572	340
MIN	330	333	245	181	208	206	439	636	763	553	308	246
AC-FT	38,060	24,560	19,380	14,550	12,840	22,390	42,100	152,900	76,670	87,600	25,000	17,450
CFSM	0.40	0.27	0.20	0.15	0.15	0.24	0.46	1.61	0.83	0.92	0.26	0.19
IN.	0.46	0.30	0.23	0.18	0.16	0.27	0.51	1.85	0.93	1.06	0.30	0.21

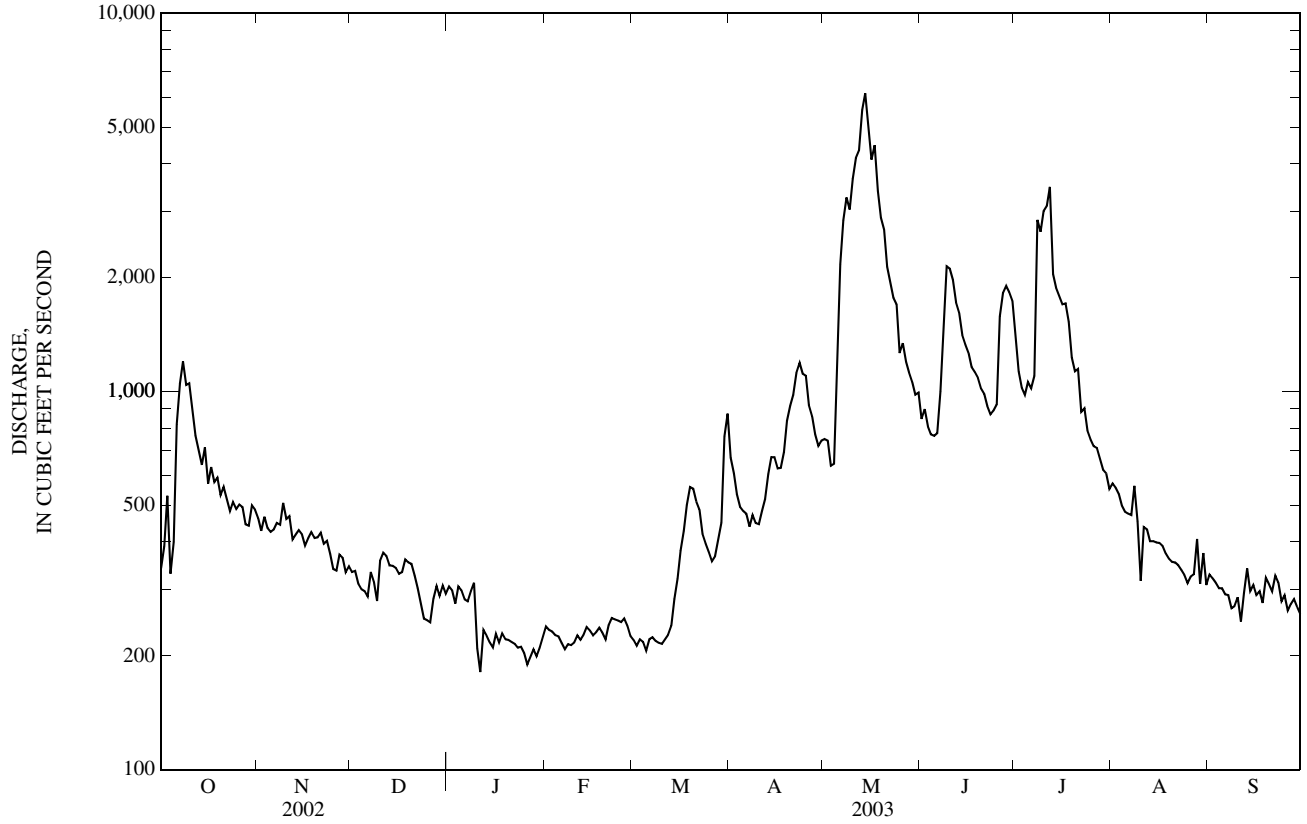
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2003, BY WATER YEAR (WY)

MEAN	463	389	354	318	311	554	2,943	2,540	1,658	913	564	387
MAX	619	413	404	422	366	868	7,454	4,340	2,634	1,425	818	525
(WY)	(2003)	(2003)	(2002)	(2001)	(2002)	(2001)	(2001)	(2001)	(2001)	(2003)	(2002)	(2001)
MIN	363	355	315	237	231	364	667	794	1,053	420	407	293
(WY)	(2001)	(2002)	(2003)	(2003)	(2003)	(2003)	(2002)	(2002)	(2002)	(2002)	(2003)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2000 - 2003	
ANNUAL TOTAL	197,779		268,943			
ANNUAL MEAN	542		737		949	
HIGHEST ANNUAL MEAN					1,584	2001
LOWEST ANNUAL MEAN					527	2002
HIGHEST DAILY MEAN	2,170	Aug 7	6,140	May 14	23,400	Apr 14, 2001
LOWEST DAILY MEAN	245	Dec 26	181	Jan 11	181	Jan 11, 2003
ANNUAL SEVEN-DAY MINIMUM	271	Dec 23	203	Jan 23	203	Jan 23, 2003
MAXIMUM PEAK FLOW			6,310	May 14	25,600	Apr 14, 2001
MAXIMUM PEAK STAGE			7.11	May 14	12.95	Apr 14, 2001
ANNUAL RUNOFF (AC-FT)	392,300		533,400		687,800	
ANNUAL RUNOFF (CFSM)	0.35		0.48		0.61	
ANNUAL RUNOFF (INCHES)	4.76		6.47		8.34	
10 PERCENT EXCEEDS	1,020		1,700		2,030	
50 PERCENT EXCEEDS	421		423		430	
90 PERCENT EXCEEDS	290		225		280	

05458300 CEDAR RIVER AT WAVERLY, IA—Continued

e Estimated



05458500 CEDAR RIVER AT JANESVILLE, IA

LOCATION.--Lat 42°38'54", long 92°27'54", in NE¼ SW¼ sec.35, T.91 N., R.14 W., Bremer County, Hydrologic Unit 07080201, on left bank 300 ft downstream from bridge on county highway at Janesville, 3.6 mi upstream from West Fork Cedar River, and at mile 207.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,661 mi^2.

PERIOD OF RECORD.--October 1904 to Sept. 1906, October 1914 to September 1927, October 1932 to September 1942, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "Red Cedar River at Janesville", 1905-06.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1906 (M), 1915-16 (M), 1917, 1918-19 (M), 1920-27, 1933-37 (M), 1940-42 (M), WDR IA-97-1:1996.

GAGE.--Water-stage recorder. Datum of gage is 868.26 ft above NGVD of 1929. Prior to July 26, 1919, nonrecording gage at site 1,000 ft downstream at datum 4.0 ft lower. July 26, 1919 to Sept. 30, 1927, Nov. 14, 1932 to Sept 30, 1942, and Apr. 26, 1946 to Nov. 10, 1949, nonrecording gage at county bridge 300 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation during low water caused by powerplant at Waverly, 10 mi upstream. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 17, 1945, reached a stage of 16.2 ft, from floodmark at site 300 ft upstream, discharge, 34,300 ft^3/s. Flood of Mar. 16, 1929, reached a stage of about 16 ft, from information by City of Waterloo, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	338	451	e346	e331	e249	e227	694	820	939	2,000	607	333
2	400	420	e349	e320	e242	e218	625	796	e980	1,520	586	323
3	552	470	e330	e310	e240	e227	513	717	894	1,420	566	316
4	350	430	e340	e331	e234	e223	528	723	869	1,300	537	305
5	428	423	e335	318	e233	e211	496	893	838	1,370	512	306
6	847	428	e330	302	e224	e227	479	2,000	847	1,180	506	294
7	1,090	444	e347	e298	e214	e230	459	3,040	1,120	1,170	502	293
8	1,230	436	e331	315	e220	e225	484	3,760	1,460	1,470	606	e272
9	1,070	504	e304	326	e218	e222	463	3,940	2,250	3,330	492	274
10	1,070	454	e380	e301	e222	e219	424	4,260	2,690	3,320	347	293
11	919	472	e395	e225	e232	e225	441	4,760	e2,890	3,350	458	250
12	822	396	381	e254	e225	e238	496	4,820	2,620	4,150	453	301
13	775	413	e366	e236	e233	e248	570	5,350	2,480	3,210	416	346
14	652	427	e368	e226	e245	e292	651	6,150	2,140	2,520	412	301
15	727	403	352	e214	e239	e329	661	6,010	1,820	1,980	412	313
16	610	382	360	e228	e232	395	663	4,370	1,730	1,770	410	293
17	618	403	346	e213	e236	408	664	4,560	1,480	1,700	401	e300
18	569	423	365	e222	e243	472	705	3,710	1,310	1,520	387	283
19	590	408	368	e207	e235	610	845	2,940	1,230	1,330	378	339
20	534	408	e362	e204	e227	642	989	2,690	1,130	1,200	368	322
21	551	427	e343	e199	e249	574	1,030	2,250	1,040	1,200	367	310
22	542	399	e318	e194	e259	524	1,160	2,070	949	1,040	362	347
23	476	406	e299	e190	e257	444	1,220	1,890	900	955	352	322
24	508	407	e272	e193	e255	408	1,180	1,820	885	897	339	295
25	496	367	e301	e190	e253	392	1,110	1,390	978	818	327	301
26	509	350	e309	e183	e261	372	1,020	1,500	1,400	753	332	274
27	501	405	e333	e194	e258	372	915	1,270	1,840	744	339	292
28	450	387	e322	e214	e235	391	836	1,240	2,250	713	423	296
29	449	342	e306	e207	---	415	798	1,160	2,180	e660	324	290
30	474	e359	e321	e221	---	670	799	1,070	2,180	641	381	286
31	468	---	e306	e234	---	999	---	1,100	---	585	311	---
TOTAL	19,615	12,444	10,485	7,600	6,670	11,649	21,918	83,069	46,319	49,816	13,213	9,070
MEAN	633	415	338	245	238	376	731	2,680	1,544	1,607	426	302
MAX	1,230	504	395	331	261	999	1,220	6,150	2,890	4,150	607	347
MIN	338	342	272	183	214	211	424	717	838	585	311	250
AC-FT	38,910	24,680	20,800	15,070	13,230	23,110	43,470	164,800	91,870	98,810	26,210	17,990
CFSM	0.38	0.25	0.20	0.15	0.14	0.23	0.44	1.61	0.93	0.97	0.26	0.18
IN.	0.44	0.28	0.23	0.17	0.15	0.26	0.49	1.86	1.04	1.12	0.30	0.20

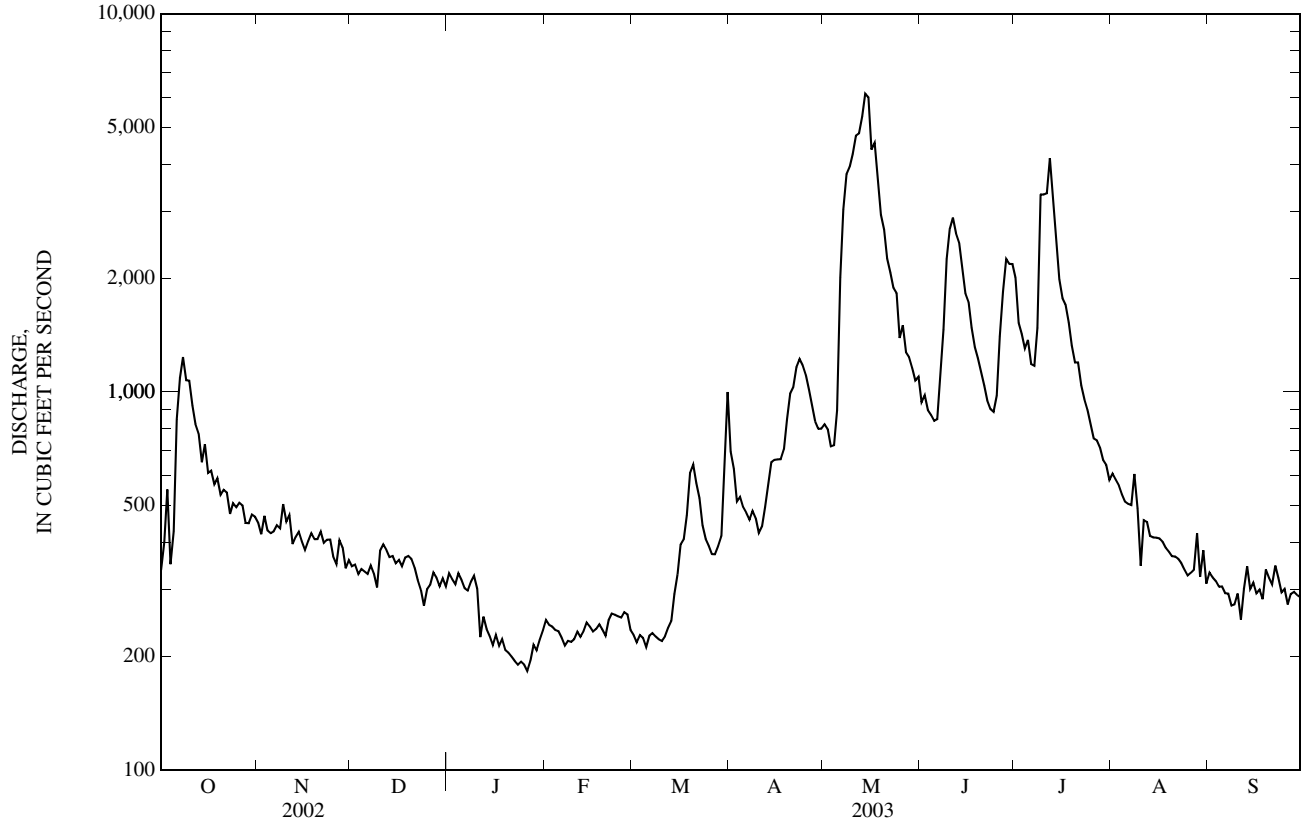
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1905 - 2003, BY WATER YEAR (WY)

MEAN	617	584	435	345	544	1,796	1,882	1,313	1,381	1,072	788	620
MAX	3,793	2,672	2,404	1,293	3,393	4,851	8,966	5,668	6,223	6,328	7,762	2,805
(WY)	(1987)	(1983)	(1983)	(1983)	(1984)	(1973)	(1993)	(1991)	(1993)	(1999)	(1993)	(1993)
MIN	101	121	75.2	80.3	61.2	124	247	134	95.2	84.7	83.6	117
(WY)	(1935)	(1934)	(1934)	(1917)	(1959)	(1934)	(1957)	(1934)	(1934)	(1934)	(1934)	(1934)

05458500 CEDAR RIVER AT JANESVILLE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1905 - 2003	
ANNUAL TOTAL	210,552		291,868			
ANNUAL MEAN	577		800		949	
HIGHEST ANNUAL MEAN					3,454	1993
LOWEST ANNUAL MEAN					187	1934
HIGHEST DAILY MEAN	2,410	Jun 8	6,150	May 14	38,800	Jul 22, 1999
LOWEST DAILY MEAN	271	Jan 24	183	Jan 26a	28	Oct 21, 1922
ANNUAL SEVEN-DAY MINIMUM	288	Jan 21	192	Jan 21	50	Feb 1, 1918
MAXIMUM PEAK FLOW			6,640	May 15	42,200	Jul 22, 1999
MAXIMUM PEAK STAGE			6.41	May 15	17.15	Jul 22, 1999
ANNUAL RUNOFF (AC-FT)	417,600		578,900		687,800	
ANNUAL RUNOFF (CFSM)	0.35		0.48		0.57	
ANNUAL RUNOFF (INCHES)	4.72		6.54		7.77	
10 PERCENT EXCEEDS	1,030		1,830		2,100	
50 PERCENT EXCEEDS	454		423		475	
90 PERCENT EXCEEDS	310		231		165	

a Ice affected.
e Estimated.



05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA

LOCATION.--Lat 42°37'50", long 92°32'24", in SW¼ SE¼ sec.6, T.90 N., R.14 W., Black Hawk County, Hydrologic Unit 07080204, on left bank 100 ft downstream from bridge on county highway C55 at Finchford, 3.2 mi upstream from Shell Rock River, and 5.0 mi upstream from mouth.

DRAINAGE AREA.--846 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1955, published as "West Fork Shell Rock River at Finchford."

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946 (M), 1947.

GAGE.--Water-stage recorder. Datum of gage is 867.54 ft above NGVD of 1929. Prior to June 10, 1955, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. An authorized diversion of 2,100 acre-ft is made into Big Marsh, 16 mi upstream from gage, each year between September 1 and November 15. Net effect on daily flows at gage is unknown. U.S. Geological Survey Data Collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of about 14 ft, from information by local resident, discharge, about 12,800 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	225	366	e197	e176	e101	e83	282	643	561	626	323	71
2	228	362	e201	e171	e102	e76	264	837	526	558	323	72
3	273	357	e186	e167	e100	e87	253	894	512	504	307	71
4	380	354	e206	e185	e93	e83	253	833	499	462	283	69
5	545	350	e199	e160	e89	e69	256	970	480	597	265	66
6	842	344	e191	e156	e84	e88	265	1,390	493	893	254	64
7	1,060	340	e214	e153	e72	e95	281	1,930	606	1,440	248	64
8	1,090	335	e184	e160	e80	e91	e290	2,530	855	1,830	235	63
9	970	328	e163	e174	e76	e90	305	2,980	1,340	2,360	221	61
10	855	326	e221	e150	e78	e85	310	3,330	1,440	2,840	210	59
11	752	324	e233	e113	e82	e103	327	3,130	1,380	3,170	205	58
12	640	317	e245	e148	e73	e131	e376	2,880	1,220	2,940	e201	68
13	583	290	e235	e145	e80	e152	e476	2,630	1,080	2,330	204	66
14	541	279	e218	e134	e89	e164	e576	2,330	948	1,670	197	65
15	489	278	e230	e121	e81	e175	616	2,110	846	1,390	188	63
16	464	260	e208	e133	e76	e204	587	1,850	759	1,330	180	60
17	449	255	e220	e112	e84	e218	559	1,690	691	e1,150	172	58
18	424	254	e222	e113	e94	e284	543	1,530	634	957	164	60
19	410	256	e250	e107	e90	327	546	1,360	587	851	154	66
20	399	256	e256	e112	e96	268	673	1,210	540	755	147	63
21	386	253	e235	e99	e93	244	938	1,090	495	733	133	66
22	371	249	e202	e91	e87	226	1,070	988	463	731	112	66
23	364	245	e158	e76	e83	207	1,000	922	438	652	100	67
24	349	241	e171	e88	e78	191	877	876	421	585	99	69
25	347	e209	e167	e73	e75	182	774	826	430	533	98	65
26	337	e198	e156	e63	e94	177	698	776	596	490	88	62
27	332	e216	e173	e71	e102	181	628	727	960	452	79	61
28	335	e204	e168	e82	e88	193	571	682	1,020	418	76	61
29	340	e173	e164	e71	---	e212	525	652	846	390	74	63
30	352	e212	e172	e79	---	e248	537	630	720	365	73	63
31	364	---	e148	e84	---	304	---	600	---	339	73	---
TOTAL	15,496	8,431	6,193	3,767	2,420	5,238	15,656	45,826	22,386	34,341	5,486	1,930
MEAN	500	281	200	122	86.4	169	522	1,478	746	1,108	177	64.3
MAX	1,090	366	256	185	102	327	1,070	3,330	1,440	3,170	323	72
MIN	225	173	148	63	72	69	253	600	421	339	73	58
AC-FT	30,740	16,720	12,280	7,470	4,800	10,390	31,050	90,900	44,400	68,120	10,880	3,830
CFSM	0.59	0.33	0.24	0.14	0.10	0.20	0.62	1.75	0.88	1.31	0.21	0.08
IN.	0.68	0.37	0.27	0.17	0.11	0.23	0.69	2.02	0.98	1.51	0.24	0.08

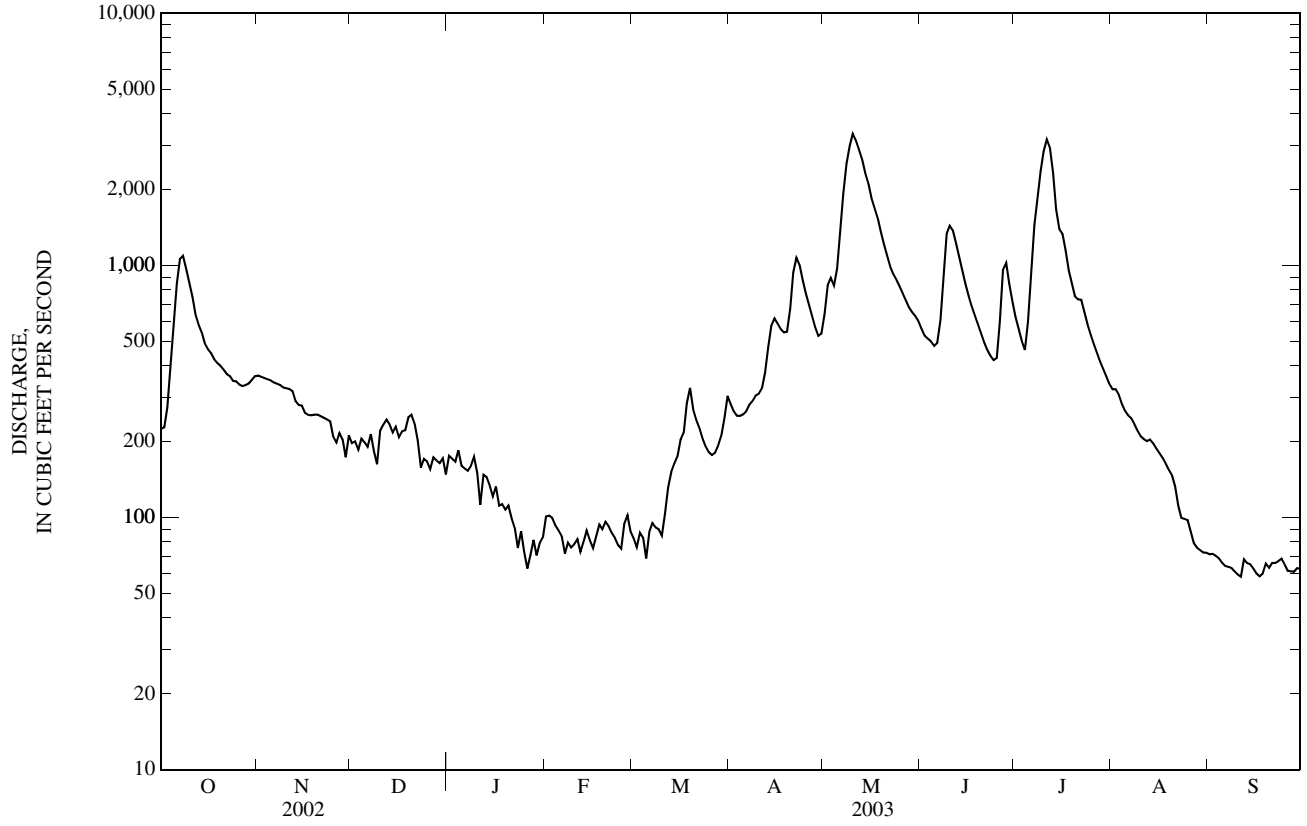
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 2003, BY WATER YEAR (WY)

MEAN	316	314	248	169	303	982	1,052	875	1,023	746	385	303
MAX	1,412	1,502	1,165	995	2,303	2,456	4,170	3,472	3,358	3,995	3,023	2,149
(WY)	(1973)	(1973)	(1983)	(1973)	(1984)	(1961)	(1965)	(1999)	(1984)	(1993)	(1993)	(1965)
MIN	14.9	22.3	14.2	9.35	6.37	86.2	81.8	80.1	39.5	26.6	15.2	16.9
(WY)	(1990)	(1959)	(1959)	(1959)	(1959)	(1954)	(1957)	(1957)	(1977)	(1977)	(1989)	(1989)

05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1946 - 2003	
ANNUAL TOTAL	138,926		167,170			
ANNUAL MEAN	381		458		560	
HIGHEST ANNUAL MEAN					1,800	1993
LOWEST ANNUAL MEAN					65.5	1956
HIGHEST DAILY MEAN	1,820	Jun 21	3,330	May 10	25,100	Jun 27, 1951
LOWEST DAILY MEAN	124	Sep 17	58	Sep 11a	5.9	Feb 26, 1959b
ANNUAL SEVEN-DAY MINIMUM	136	Sep 13	62	Sep 5	6.1	Feb 23, 1959
MAXIMUM PEAK FLOW			3,400	May 10	31,900	Jun 27, 1951
MAXIMUM PEAK STAGE			11.67	May 10	18.45	Jul 29, 1990
INSTANTANEOUS LOW FLOW			56	Sep 28	5.9	Feb 26, 1959
ANNUAL RUNOFF (AC-FT)	275,600		331,600		406,000	
ANNUAL RUNOFF (CFSM)	0.45		0.54		0.66	
ANNUAL RUNOFF (INCHES)	6.11		7.35		9.00	
10 PERCENT EXCEEDS	693		1,010		1,370	
50 PERCENT EXCEEDS	312		253		243	
90 PERCENT EXCEEDS	164		73		48	

a Also Sept. 17.
b Also Feb. 27, 1959.
e Estimated.



05459500 WINNEBAGO RIVER AT MASON CITY, IA

LOCATION.--Lat 43°09'54", long 93°11'33", in NE¼ NW¼ sec.3, T.96 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, on right bank 650 ft upstream from Thirteenth Street Bridge in Mason City, 0.1 mi downstream from Calmus Creek, 1.0 mi upstream from Willow Creek, and at mile 275.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--526 mi^2.

PERIOD OF RECORD.--October 1932 to current year. Prior to December 1932, monthly discharge only, published in WSP 1308. Prior to October 1959, published as "Lime Creek at Mason City".

REVISED RECORDS.--WSP 825: 1935-36. WSP 1438: Drainage area. WSP 1558: 1933-37, 1943 (M), 1945, 1948.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,069.59 ft above NGVD of 1929. Prior to Oct. 15, 1934, nonrecording gage at datum 6.47 ft lower. Oct. 15 to Nov. 6, 1934, nonrecording gage at different datum, and Nov. 7, 1934, to Mar. 22, 1935, nonrecording gage at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	137	262	83	e80	e55	43	289	312	365	643	147	46
2	162	254	145	e79	e56	e33	257	304	352	552	139	45
3	294	248	99	e72	e54	36	233	295	347	484	132	42
4	1,160	242	133	e86	e46	37	227	374	334	456	127	42
5	1,800	240	105	e75	e45	e33	219	e1,190	324	455	121	42
6	1,440	240	104	e73	e42	e43	207	e1,470	343	453	120	40
7	1,180	228	136	e75	e32	e46	205	1,380	412	483	119	40
8	1,000	224	118	e79	e36	e36	214	1,260	549	476	114	37
9	852	225	107	e59	e32	e29	209	1,580	671	616	107	34
10	737	222	124	e40	e32	e35	256	1,580	645	779	106	33
11	645	212	123	e36	e36	e45	415	1,810	618	827	115	31
12	576	199	126	e35	e30	49	457	1,840	582	745	104	43
13	524	196	129	e39	e37	47	442	1,610	547	664	96	53
14	488	200	128	e35	e43	52	414	e1,340	496	597	90	47
15	455	196	135	e34	e38	e59	397	e1,430	450	633	89	44
16	423	189	117	e46	e33	e70	403	e1,450	405	614	88	38
17	406	183	117	e38	e39	e112	479	e1,330	373	536	83	35
18	390	181	147	e35	e49	e139	486	e1,170	350	483	76	35
19	366	180	150	e36	e46	e126	482	e1,050	320	437	72	36
20	338	177	138	e46	e55	e144	541	969	289	388	79	36
21	323	174	111	e42	e53	e137	582	885	261	360	76	35
22	310	170	96	e39	e48	e108	560	812	256	326	70	36
23	289	166	70	e34	e44	93	519	756	430	297	69	36
24	285	165	e68	e43	e37	88	473	699	630	271	66	39
25	295	157	e85	e31	e34	86	431	639	1,150	240	61	38
26	301	126	e78	e22	e41	83	388	584	1,660	219	57	35
27	288	124	e82	e26	49	109	356	534	1,360	201	56	33
28	281	149	e80	e36	45	473	327	498	1,140	183	55	34
29	279	174	e77	e28	---	548	304	464	951	171	51	35
30	279	126	e77	e36	---	462	299	435	771	162	50	34
31	270	---	e65	e41	---	390	---	400	---	152	47	---
TOTAL	16,573	5,829	3,353	1,476	1,187	3,791	11,071	30,450	17,381	13,903	2,782	1,154
MEAN	535	194	108	47.6	42.4	122	369	982	579	448	89.7	38.5
MAX	1,800	262	150	86	56	548	582	1,840	1,660	827	147	53
MIN	137	124	65	22	30	29	205	295	256	152	47	31
AC-FT	32,870	11,560	6,650	2,930	2,350	7,520	21,960	60,400	34,480	27,580	5,520	2,290
CFSM	1.02	0.37	0.21	0.09	0.08	0.23	0.70	1.87	1.10	0.85	0.17	0.07
IN.	1.17	0.41	0.24	0.10	0.08	0.27	0.78	2.15	1.23	0.98	0.20	0.08

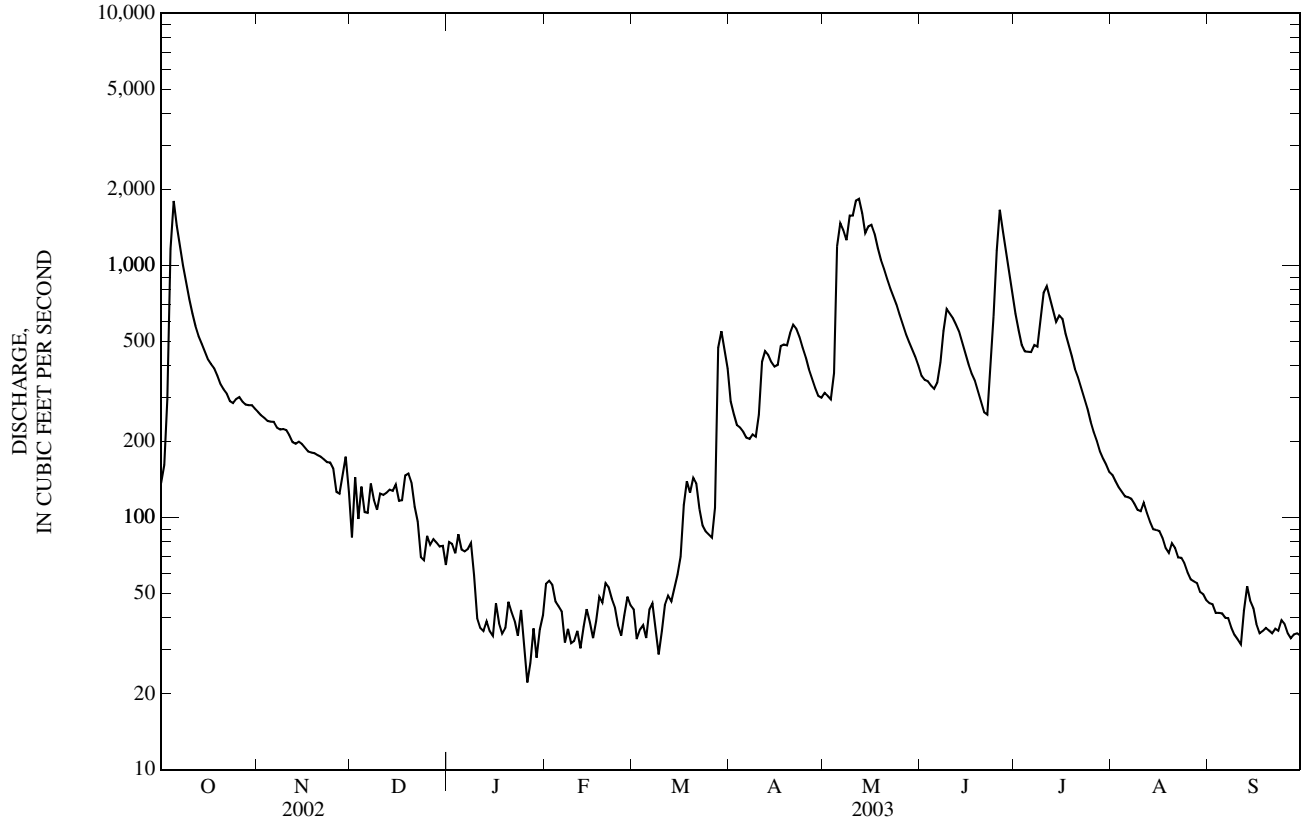
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 2003, BY WATER YEAR (WY)

MEAN	175	168	110	74.3	120	507	618	438	499	321	221	176
MAX	840	811	724	378	1,002	1,707	2,880	1,807	2,160	1,915	2,054	1,073
(WY)	(1966)	(1942)	(1983)	(1983)	(1984)	(1973)	(1965)	(1991)	(1993)	(1993)	(1979)	(1938)
MIN	11.3	12.7	7.45	6.61	7.50	17.6	61.0	16.1	21.9	7.29	4.89	12.6
(WY)	(1935)	(1934)	(1934)	(1977)	(1959)	(1934)	(1957)	(1934)	(1934)	(1934)	(1934)	(1933)

05459500 WINNEBAGO RIVER AT MASON CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1933 - 2003	
ANNUAL TOTAL	89,857		108,950			
ANNUAL MEAN	246		298		286	
HIGHEST ANNUAL MEAN					947	1993
LOWEST ANNUAL MEAN					28.1	1934
HIGHEST DAILY MEAN	2,050	Aug 6	1,840	May 12	9,370	Mar 27, 1961
LOWEST DAILY MEAN	25	Jan 18	22	Jan 26a	1.2	Aug 19, 1989
ANNUAL SEVEN-DAY MINIMUM	34	Feb 1	31	Jan 23	3.1	Dec 29, 1933
MAXIMUM PEAK FLOW			2,060	May 11	10,800	Mar 30, 1933
MAXIMUM PEAK STAGE			6.84	May 11	15.70	Mar 30, 1933
INSTANTANEOUS LOW FLOW					0.86	Aug 18, 1988b
ANNUAL RUNOFF (AC-FT)	178,200		216,100		207,100	
ANNUAL RUNOFF (CFSM)	0.47		0.57		0.54	
ANNUAL RUNOFF (INCHES)	6.35		7.71		7.39	
10 PERCENT EXCEEDS	606		682		728	
50 PERCENT EXCEEDS	135		150		114	
90 PERCENT EXCEEDS	48		36		21	

a Ice affected.
b Also Aug. 19, 1988.
e Estimated.



05460000 CLEAR LAKE AT CLEAR LAKE, IA

LOCATION.--Lat 43°08'01", long 93°22'57", in SE¼ NE¼ sec.13, T.96 N., R.22 W., Cerro Gordo County, Hydrologic Unit 07080203, at the public bathing beach in the town of Clear Lake, near dam across Clear Creek.

DRAINAGE AREA.--22.6 mi^2.

PERIOD OF RECORD.--May 1933 to current year. No winter records 1933-52. Record fragmentary November 1952 to June 1959.

GAGE.--Water-stage recorder. Datum of gage is 1,222.24 ft above NGVD of 1929, and 4.60 ft below crest of spillway of dam at outlet. See WSP 1708 for history of changes prior to June 25, 1959.

REMARKS.--Lake is formed by concrete dam on Clear Creek with ungated overflow spillway 50 ft long at elevation 1,226.84 ft above sea level. Dam constructed in 1903. A previous outlet works had been constructed in 1887. Lake is used for conservation and recreation. Area of lake is approximately 3,600 acres. U.S. Geological Survey satellite data collection platform at station.

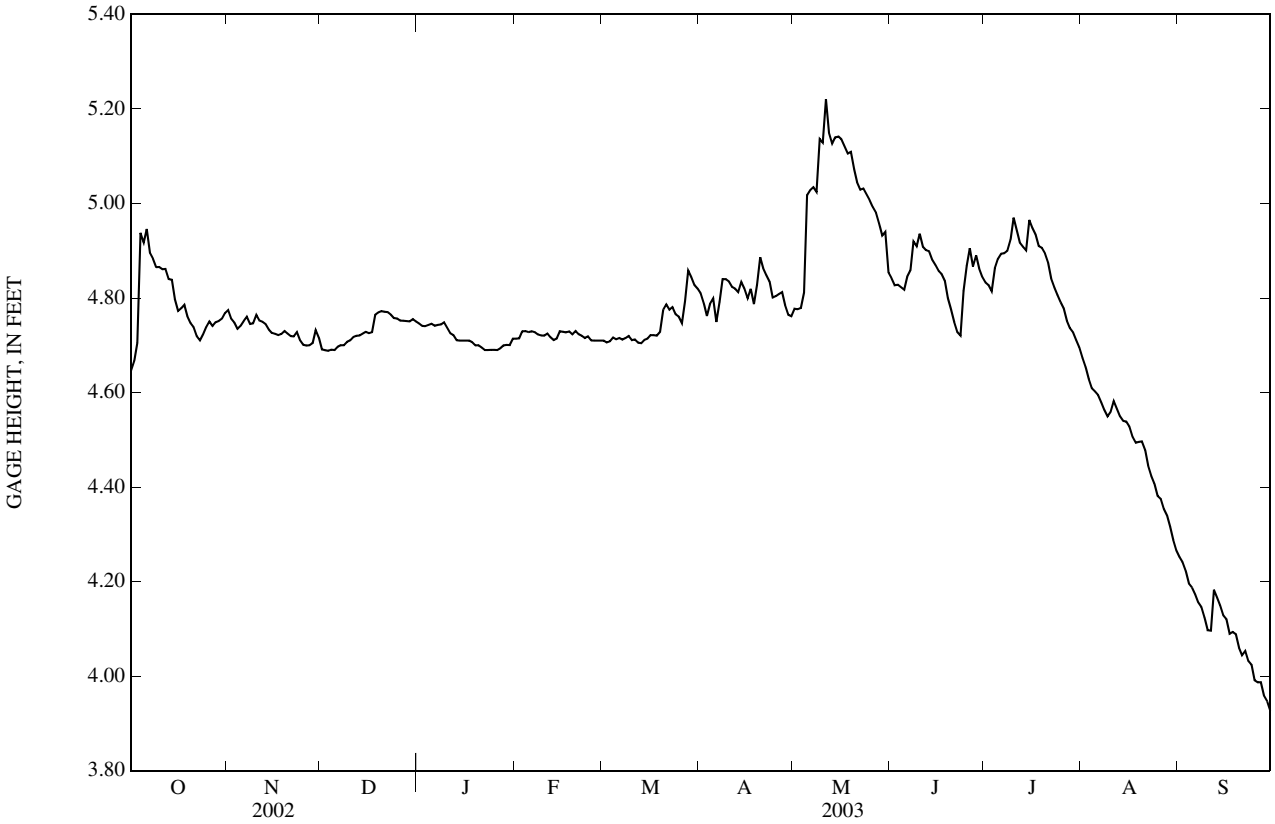
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.94 ft July 3, 1951; minimum observed, 0.76 ft Oct. 26, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.27 ft May 11; minimum, 3.91 ft Sept. 30.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.65	4.77	4.69	4.75	4.71	4.71	4.81	4.78	4.84	4.83	4.67	4.25
2	4.67	4.76	4.69	4.74	4.71	4.71	4.79	4.78	4.83	4.83	4.65	4.24
3	4.70	4.75	4.69	4.74	4.73	4.71	4.76	4.78	4.83	4.81	4.63	4.22
4	4.94	4.73	4.69	4.74	4.73	4.72	4.79	4.81	4.82	4.86	4.61	4.20
5	4.92	4.74	4.69	4.75	4.73	4.71	4.80	5.02	4.82	4.88	4.60	4.19
6	4.95	4.75	4.70	4.74	4.73	4.72	4.75	5.03	4.84	4.89	4.59	4.17
7	4.90	4.76	4.70	4.74	4.73	4.71	4.79	5.03	4.86	4.89	4.58	4.16
8	4.88	4.75	4.70	4.74	4.72	4.72	4.84	5.02	4.92	4.90	4.56	4.15
9	4.87	4.75	4.71	4.75	4.72	4.72	4.84	5.14	4.91	4.92	4.55	4.12
10	4.87	4.76	4.71	4.74	4.72	4.71	4.84	5.13	4.94	4.97	4.56	4.10
11	4.86	4.75	4.72	4.73	4.72	4.71	4.82	5.22	4.91	4.94	4.58	4.10
12	4.86	4.75	4.72	4.72	4.72	4.71	4.82	5.15	4.90	4.92	4.57	4.18
13	4.84	4.74	4.72	4.71	4.71	4.70	4.81	5.13	4.90	4.91	4.55	4.17
14	4.84	4.73	4.72	4.71	4.71	4.71	4.83	5.14	4.88	4.90	4.54	4.15
15	4.80	4.73	4.73	4.71	4.73	4.71	4.82	5.14	4.87	4.97	4.54	4.13
16	4.77	4.72	4.73	4.71	4.73	4.72	4.80	5.14	4.86	4.95	4.53	4.12
17	4.78	4.72	4.73	4.71	4.73	4.72	4.82	5.12	4.85	4.93	4.51	4.09
18	4.79	4.72	4.76	4.71	4.73	4.72	4.79	5.11	4.84	4.91	4.49	4.09
19	4.76	4.73	4.77	4.70	4.72	4.73	4.83	5.11	4.80	4.91	4.50	4.09
20	4.75	4.72	4.77	4.70	4.73	4.78	4.89	5.07	4.78	4.89	4.50	4.06
21	4.74	4.72	4.77	4.70	4.72	4.79	4.86	5.04	4.75	4.88	4.48	4.04
22	4.72	4.72	4.77	4.69	4.72	4.78	4.85	5.03	4.73	4.84	4.45	4.05
23	4.71	4.73	4.76	4.69	4.72	4.78	4.83	5.03	4.72	4.82	4.42	4.03
24	4.72	4.71	4.76	4.69	4.72	4.77	4.80	5.02	4.81	4.81	4.41	4.02
25	4.74	4.70	4.76	4.69	4.71	4.76	4.80	5.01	4.87	4.79	4.38	3.99
26	4.75	4.70	4.75	4.69	4.71	4.75	4.81	4.99	4.91	4.78	4.37	3.99
27	4.74	4.70	4.75	4.69	4.71	4.79	4.81	4.98	4.87	4.75	4.35	3.99
28	4.75	4.70	4.75	4.70	4.71	4.86	4.78	4.96	4.89	4.74	4.34	3.96
29	4.75	4.73	4.75	4.70	---	4.84	4.76	4.93	4.86	4.73	4.32	3.95
30	4.76	4.72	4.76	4.70	---	4.83	4.76	4.94	4.84	4.71	4.29	3.93
31	4.77	---	4.75	4.71	---	4.82	---	4.85	---	4.70	4.27	---
MEAN	4.79	4.73	4.73	4.72	4.72	4.75	4.81	5.02	4.85	4.86	4.50	4.10
MAX	4.95	4.77	4.77	4.75	4.73	4.86	4.89	5.22	4.94	4.97	4.67	4.25
MIN	4.65	4.70	4.69	4.69	4.71	4.70	4.75	4.78	4.72	4.70	4.27	3.93

05460000 CLEAR LAKE AT CLEAR LAKE, IA—Continued



05462000 SHELL ROCK RIVER AT SHELL ROCK, IA

LOCATION.--Lat 42°42'43", long 92°34'58", in NW¼ NE¼ sec.11, T.91 N., R.15 W., Butler County, Hydrologic Unit 07080202 on right bank 400 ft upstream from bridge on county highway C45 in Shell Rock, 2.2 mi downstream from Curry Creek, and 10.4 mi upstream from mouth.

DRAINAGE AREA.--1,746 mi^2.

PERIOD OF RECORD.--June 1953 to current year. Prior to July 1953, monthly discharge only, published in WSP 1728.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Rockfill dam since Oct. 19, 1957. Datum of gage is 885.34 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1856 reached a stage of 17.7 ft at bridge 400 ft downstream, from information provided by U.S. Army Corps of Engineers, discharge, about 45,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	375	698	e338	e314	221	e218	854	929	1,090	2,180	574	285
2	380	675	e358	e309	229	e210	754	931	1,030	1,860	615	280
3	412	661	344	e306	e226	219	692	894	984	1,610	471	275
4	557	655	356	e321	e222	204	657	893	951	1,470	498	274
5	1,890	644	353	e302	e222	e196	636	1,780	919	1,460	485	265
6	3,280	640	345	e296	e215	e215	604	e4,710	981	1,450	481	264
7	2,850	632	382	e293	e209	e220	620	5,090	1,320	1,530	464	263
8	2,450	623	390	e300	e214	216	599	4,770	2,160	1,710	445	257
9	2,130	611	e359	e314	e210	208	593	5,020	3,560	2,040	434	253
10	1,820	605	380	e281	e212	210	616	6,030	3,260	2,540	423	246
11	1,590	599	394	e200	214	214	682	5,850	e2,950	3,090	424	248
12	1,420	586	411	e261	205	217	1,010	6,050	2,500	3,080	451	277
13	1,280	572	399	e258	e208	222	1,180	6,120	2,280	2,690	440	278
14	1,160	571	382	e252	214	246	1,110	5,450	2,070	2,330	407	281
15	1,100	564	394	e246	e209	286	1,040	5,040	1,830	2,120	403	278
16	1,020	545	370	259	e201	334	1,010	4,960	1,630	2,110	392	264
17	953	534	393	245	e206	418	1,030	4,440	1,480	1,990	385	255
18	924	525	400	247	215	483	1,190	3,880	1,360	1,720	368	262
19	888	523	448	238	e209	491	1,280	3,470	1,260	1,500	358	279
20	839	513	454	235	e206	506	1,360	3,130	1,150	1,340	351	264
21	808	519	433	229	e231	507	1,650	2,830	1,050	1,240	347	267
22	780	505	364	224	e239	476	1,710	2,570	970	1,120	344	275
23	753	499	309	209	e236	426	e1,580	2,340	909	1,030	334	259
24	738	491	313	205	e235	393	1,400	2,140	1,060	e950	329	254
25	736	e435	282	203	e232	373	1,280	1,960	1,530	846	322	251
26	737	e404	e274	199	248	358	1,160	1,770	3,140	781	316	254
27	739	e413	e309	195	240	344	1,070	1,610	4,080	722	311	253
28	734	381	e303	199	e225	438	987	1,480	3,520	675	303	248
29	719	e350	e300	201	---	822	909	e1,370	2,980	641	301	241
30	715	e364	e302	201	---	1,130	907	1,260	2,570	612	294	242
31	709	---	e296	209	---	993	---	1,170	---	583	286	---
TOTAL	35,486	16,337	11,135	7,751	6,153	11,793	30,170	99,937	56,574	49,020	12,356	7,892
MEAN	1,145	545	359	250	220	380	1,006	3,224	1,886	1,581	399	263
MAX	3,280	698	454	321	248	1,130	1,710	6,120	4,080	3,090	615	285
MIN	375	350	274	195	201	196	593	893	909	583	286	241
AC-FT	70,390	32,400	22,090	15,370	12,200	23,390	59,840	198,200	112,200	97,230	24,510	15,650
CFSM	0.66	0.31	0.21	0.14	0.13	0.22	0.58	1.85	1.08	0.91	0.23	0.15
IN.	0.76	0.35	0.24	0.17	0.13	0.25	0.64	2.13	1.21	1.04	0.26	0.17

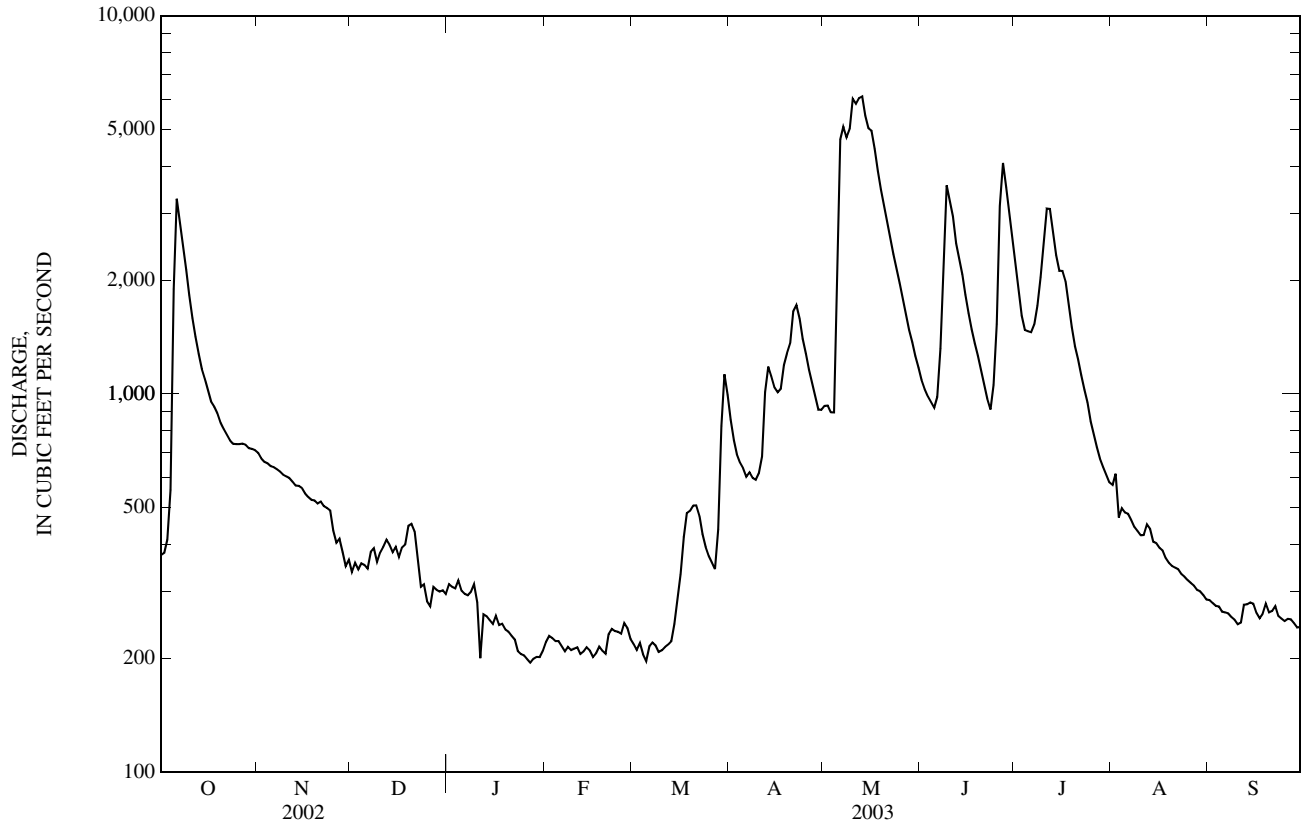
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2003, BY WATER YEAR (WY)

MEAN	737	682	513	346	493	1,604	2,104	1,700	1,805	1,338	901	688
MAX	2,544	2,326	2,381	1,375	2,833	5,426	8,540	5,889	6,239	6,461	5,637	2,816
(WY)	(1987)	(1983)	(1983)	(1983)	(1984)	(1992)	(1965)	(1991)	(1993)	(1993)	(1979)	(1993)
MIN	74.1	77.7	39.8	45.6	44.7	193	226	243	138	114	66.7	96.6
(WY)	(1990)	(1990)	(1990)	(1959)	(1959)	(1968)	(1957)	(1958)	(1977)	(1977)	(1989)	(1989)

05462000 SHELL ROCK RIVER AT SHELL ROCK, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1954 - 2003	
ANNUAL TOTAL	239,644		344,604			
ANNUAL MEAN	657		944		1,078	
HIGHEST ANNUAL MEAN					3,231	1993
LOWEST ANNUAL MEAN					171	1977
HIGHEST DAILY MEAN	4,850	Aug 7	6,120	May 13	32,100	Mar 28, 1961
LOWEST DAILY MEAN	172	Feb 4	195	Jan 27	27	Dec 22, 1989
ANNUAL SEVEN-DAY MINIMUM	205	Feb 2	200	Jan 24	29	Dec 16, 1989
MAXIMUM PEAK FLOW			6,400	May 13	33,500	Mar 28, 1961
MAXIMUM PEAK STAGE			11.23	May 13	16.73	Jul 22, 1999
INSTANTANEOUS LOW FLOW			186	Jan 27		
ANNUAL RUNOFF (AC-FT)	475,300		683,500		780,700	
ANNUAL RUNOFF (CFSM)	0.38		0.54		0.62	
ANNUAL RUNOFF (INCHES)	5.11		7.34		8.39	
10 PERCENT EXCEEDS	1,170		2,220		2,540	
50 PERCENT EXCEEDS	469		491		535	
90 PERCENT EXCEEDS	260		220		160	

e Estimated



05463000 BEAVER CREEK AT NEW HARTFORD, IA

LOCATION.--Lat 42°34'22", long 92°37'04", in SE¼ SE¼ sec.28, T.90 N., R.15 W., Butler County, Hydrologic Unit 07080205, on right bank 5 ft. from right end of bridge on county highway T55, 0.2 mi north of New Hartford, and 8 mi upstream from mouth.

DRAINAGE AREA.--347 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to April 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1948-49. WSP 1708: 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 882.44 ft. above NGVD of 1929. Prior to July 14, 1959, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	89	e43	e34	e41	e27	72	e490	211	232	118	33
2	e50	88	e51	e33	e44	e24	70	e500	205	202	111	33
3	84	88	e44	e28	e42	e30	68	402	210	176	103	32
4	97	85	e50	e39	e35	e34	70	356	201	155	96	30
5	113	84	e46	e32	e32	e29	74	694	191	261	92	29
6	126	83	e45	e31	e30	e37	75	1,080	212	654	91	29
7	112	80	e51	e33	e21	e45	73	1,120	323	1,060	89	28
8	100	78	e45	e40	e26	e39	84	1,240	683	957	83	27
9	95	76	e45	e27	e21	e34	85	1,510	1,080	1,330	78	26
10	89	74	e49	e15	e21	e43	88	2,220	841	2,610	74	25
11	85	72	e46	e11	e24	e52	130	e1,500	677	2,520	76	25
12	82	70	e47	e9.2	e20	e57	200	1,180	560	1,290	72	31
13	77	69	e49	e15	e27	e55	193	892	480	827	67	44
14	76	68	e47	e12	e33	e66	166	821	412	636	64	38
15	74	67	e53	e10	e28	e74	147	967	361	559	62	33
16	73	67	e39	e21	e23	e90	138	851	322	492	59	30
17	73	e65	e40	e14	e28	e125	133	705	e290	427	56	28
18	72	67	e64	e11	e36	168	e128	604	e270	369	53	28
19	69	e65	e67	e13	e34	104	e136	500	253	324	51	34
20	67	65	e58	e27	e42	81	e233	460	229	296	49	32
21	66	64	e40	e21	e39	76	345	432	213	295	46	31
22	65	62	e35	e17	e35	68	337	405	201	272	44	36
23	63	61	e27	e14	e31	63	272	377	188	240	e43	36
24	65	61	e26	e23	e26	58	233	352	181	215	e42	33
25	70	e52	e37	e13	e24	56	209	328	197	197	40	31
26	73	e46	e29	e11	e31	55	184	302	683	180	38	30
27	70	e44	e32	e14	e30	58	164	279	608	163	37	31
28	73	e51	e31	e20	e28	e67	147	265	430	150	36	31
29	79	e60	e31	e15	---	e72	135	250	340	139	35	30
30	87	e50	e31	e25	---	e72	e211	245	274	131	e34	29
31	91	---	e21	e30	---	73	---	230	---	120	33	---
TOTAL	2,464	2,051	1,319	658.2	852	1,932	4,600	21,557	11,326	17,479	1,972	933
MEAN	79.5	68.4	42.5	21.2	30.4	62.3	153	695	378	564	63.6	31.1
MAX	126	89	67	40	44	168	345	2,220	1,080	2,610	118	44
MIN	48	44	21	9.2	20	24	68	230	181	120	33	25
AC-FT	4,890	4,070	2,620	1,310	1,690	3,830	9,120	42,760	22,470	34,670	3,910	1,850
CFSM	0.23	0.20	0.12	0.06	0.09	0.18	0.44	2.00	1.09	1.62	0.18	0.09
IN.	0.26	0.22	0.14	0.07	0.09	0.21	0.49	2.31	1.21	1.87	0.21	0.10

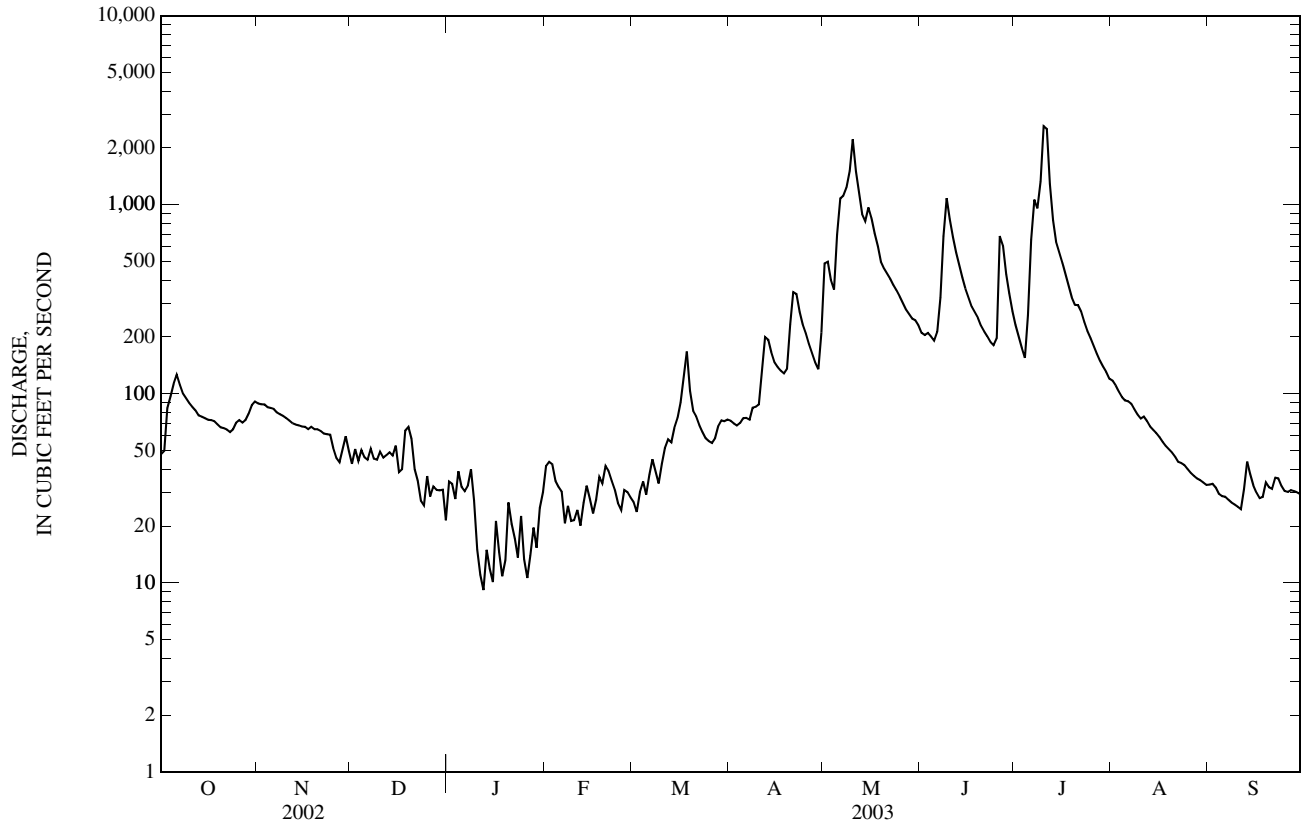
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 2003, BY WATER YEAR (WY)

MEAN	118	123	84.9	71.8	150	445	380	348	430	283	142	106
MAX	495	673	514	403	651	1,606	1,578	1,606	2,213	1,686	1,368	1,028
(WY)	(1987)	(1973)	(1983)	(1946)	(1983)	(1993)	(1993)	(1991)	(1947)	(1993)	(1993)	(1965)
MIN	4.98	8.80	7.13	2.88	3.84	28.1	33.8	23.2	12.5	4.47	4.22	6.02
(WY)	(1957)	(1957)	(1990)	(1956)	(1956)	(1954)	(1954)	(1977)	(1956)	(1956)	(1989)	(1988)

05463000 BEAVER CREEK AT NEW HARTFORD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1946 - 2003	
ANNUAL TOTAL	43,776		67,143.2			
ANNUAL MEAN	120		184		224	
HIGHEST ANNUAL MEAN					874	1993
LOWEST ANNUAL MEAN					21.8	1956
HIGHEST DAILY MEAN	1,310	Jun 20	2,610	Jul 10	16,300	Jun 13, 1947
LOWEST DAILY MEAN	21	Dec 31	9.2	Jan 12a	2.0	Sep 30, 1989
ANNUAL SEVEN-DAY MINIMUM	30	Dec 25	13	Jan 11	2.3	Jan 19, 1956
MAXIMUM PEAK FLOW			3,260	Jul 10	18,000	Jun 13, 1947
MAXIMUM PEAK STAGE			10.07	Jul 10	13.50	Jun 13, 1947
ANNUAL RUNOFF (AC-FT)	86,830		133,200		162,100	
ANNUAL RUNOFF (CFSM)	0.35		0.53		0.64	
ANNUAL RUNOFF (INCHES)	4.69		7.20		8.76	
10 PERCENT EXCEEDS	212		468		490	
50 PERCENT EXCEEDS	84		68		88	
90 PERCENT EXCEEDS	44		27		17	

a Ice affected.
e Estimated.



05463050 CEDAR RIVER AT CEDAR FALLS, IA

LOCATION.--Lat 42°32'20", long 92°26'58", in NW¼ NE¼ sec.12, T.89 N., R.14 W., Black Hawk County, Hydrologic Unit 07080205, at bridge on U.S. Highway 20 at Cedar Falls, 1.1 mi upstream from Dry Run, and at mile 196.0 upstream from mouth of Iowa River.

DRAINAGE AREA.--4,734 mi^2.

PERIOD OF RECORD.--October 1975 to September 1979, May 1984 to September 1985, October 1986 to September 1995; water quality data. October 1999 to current year.

GAGE.--Water-stage recorder. Datum of gage is 855.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily stages, which are poor. U.S. Geological Survey rain gage and satellite data collection platform with phone modem at station.

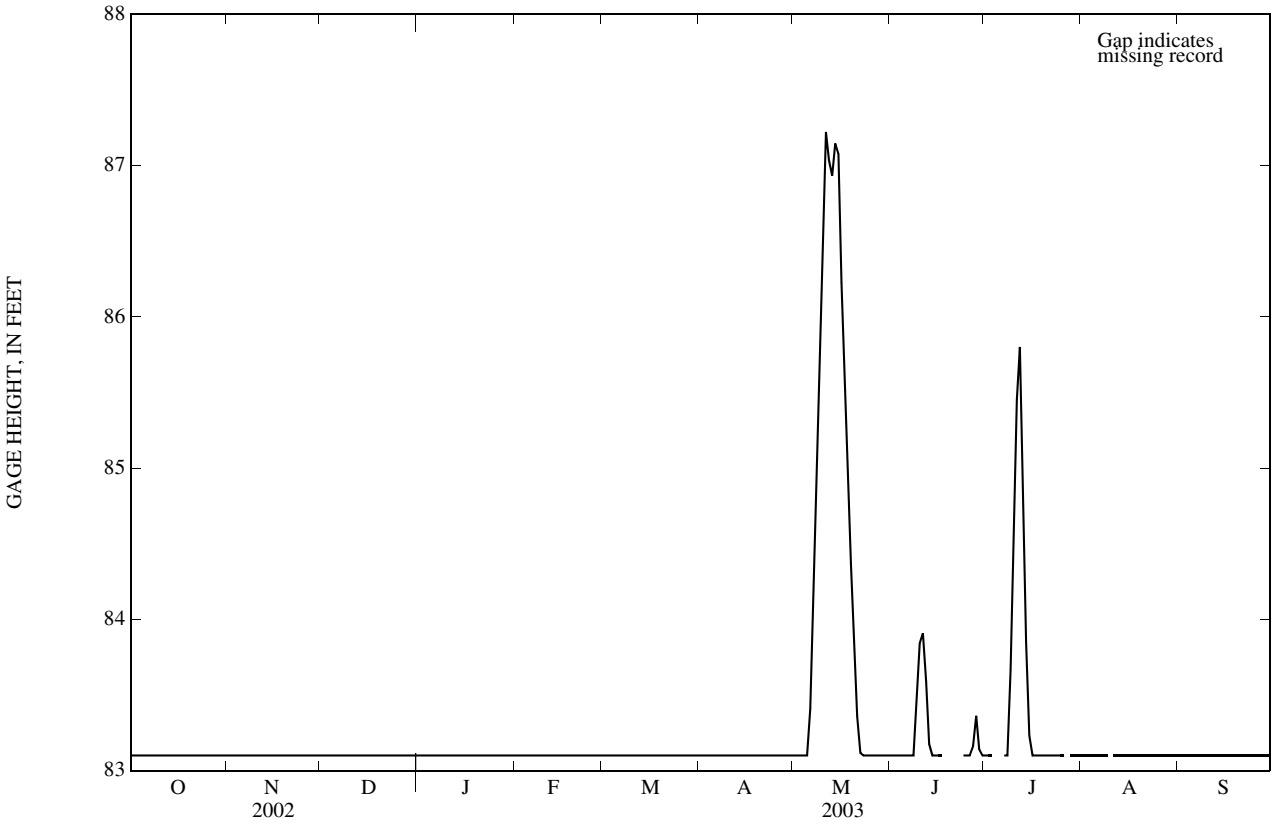
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height 93.99 ft Apr. 14, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum gage height 87.29 ft May 11.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10
2	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10
3	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10
4	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	---	83.10	83.10
5	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	---	83.10	83.10
6	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.41	83.10	---	83.10	83.10
7	83.10	83.10	83.10	83.10	83.10	83.10	83.10	84.69	83.10	83.10	83.10	83.10
8	83.10	83.10	83.10	83.10	83.10	83.10	83.10	85.57	83.10	83.10	83.10	83.10
9	83.10	83.10	83.10	83.10	83.10	83.10	83.10	86.21	83.44	83.67	83.10	83.10
10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	86.65	83.84	84.72	---	83.10
11	83.10	83.10	83.10	83.10	83.10	83.10	83.10	87.22	83.91	85.45	83.10	83.10
12	83.10	83.10	83.10	83.10	83.10	83.10	83.10	87.03	83.59	85.80	83.10	83.10
13	83.10	83.10	83.10	83.10	83.10	83.10	83.10	86.93	83.18	85.07	83.10	83.10
14	83.10	83.10	83.10	83.10	83.10	83.10	83.10	87.15	83.10	83.84	83.10	83.10
15	83.10	83.10	83.10	83.10	83.10	83.10	83.10	87.08	83.10	83.23	83.10	83.10
16	83.10	83.10	83.10	83.10	83.10	83.10	83.10	86.23	83.10	83.10	83.10	83.10
17	83.10	83.10	83.10	83.10	83.10	83.10	83.10	85.76	83.10	83.10	83.10	83.10
18	83.10	83.10	83.10	83.10	83.10	83.10	83.10	85.23	---	83.10	83.10	83.10
19	83.10	83.10	83.10	83.10	83.10	83.10	83.10	84.37	---	83.10	83.10	83.10
20	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.87	---	83.10	83.10	83.10
21	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.36	---	83.10	83.10	83.10
22	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.12	---	83.10	83.10	83.10
23	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	---	83.10	83.10	83.10
24	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10
25	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10
26	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10
27	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.16	---	83.10	83.10
28	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.36	83.10	83.10	83.10
29	83.10	83.10	83.10	83.10	---	83.10	83.10	83.10	83.14	83.10	83.10	83.10
30	83.10	83.10	83.10	83.10	---	83.10	83.10	83.10	83.10	83.10	83.10	83.10
31	83.10	---	83.10	83.10	---	83.10	---	83.10	---	83.10	83.10	---
MEAN	83.10	83.10	83.10	83.10	83.10	83.10	83.10	84.43	---	---	---	83.10
MAX	83.10	83.10	83.10	83.10	83.10	83.10	83.10	87.22	---	---	---	83.10
MIN	83.10	83.10	83.10	83.10	83.10	83.10	83.10	83.10	---	---	---	83.10

05463050 CEDAR RIVER AT CEDAR FALLS, IA—Continued



05463500 BLACK HAWK CREEK AT HUDSON, IA

LOCATION.--Lat 42°24'28", long 92°27'47", in SW¼ NE¼ sec.27, T.88 N., R.14 W., Black Hawk County, Hydrologic Unit 07080205, on left bank 35 ft. from bridge on State Highway 58, 0.2 mi northwest of Chicago and Great Western Railway tracks at the west edge of Hudson, 4.5 mi. upstream from Prescotts Creek, and 9.6 mi. upstream from mouth.

DRAINAGE AREA.--303 mi^2.

PERIOD OF RECORD.--April 1952 to September 30, 1995. October 2001 to September 30, 2002.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 865.03 ft. above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	58	e27	e24	e34	e15	46	424	237	190	67	18
2	38	57	e35	e23	e39	e14	45	435	232	180	63	18
3	55	57	e28	e18	e37	e20	44	330	236	169	60	18
4	66	55	e34	e27	e28	e23	46	296	224	158	57	17
5	72	55	e30	e23	e26	e19	47	775	212	225	56	17
6	68	55	e29	e22	e23	e27	46	844	220	308	55	e16
7	59	53	e34	e24	e13	e33	46	881	291	240	53	e15
8	55	51	e30	e29	e20	e27	54	1,070	399	217	49	15
9	52	52	e29	e18	e15	e22	56	1,360	652	334	46	14
10	50	51	e33	e8.6	e16	e29	60	1,750	575	485	44	14
11	48	50	e30	e6.9	e19	e39	91	1,370	474	409	43	14
12	46	46	e32	e5.7	e15	e44	122	899	408	321	41	17
13	45	46	e33	e9.8	e21	e41	107	717	364	270	39	25
14	43	46	e31	e7.4	e27	e48	93	754	327	238	37	22
15	43	46	e37	e6.0	e22	e55	85	1,070	296	225	36	18
16	42	44	e25	e15	e17	e65	83	1,010	274	210	34	16
17	43	44	e26	e8.6	e22	e110	82	778	257	187	32	15
18	44	44	e40	e6.0	e29	143	79	654	243	171	30	15
19	43	44	e44	e8.1	e26	89	84	576	225	157	29	20
20	40	44	e37	e19	e35	56	159	512	207	147	28	24
21	39	43	e26	e14	e33	48	241	461	196	143	27	19
22	39	42	e21	e11	e28	43	206	430	194	131	25	21
23	38	41	e17	e6.5	e24	40	171	404	186	118	24	21
24	39	41	e15	e15	e19	38	151	378	175	110	24	18
25	45	34	e24	e7.4	e16	36	137	353	172	103	23	16
26	50	e30	e18	e5.5	e20	35	123	329	282	95	22	16
27	50	e28	e22	e8.9	e19	39	110	307	279	89	21	17
28	50	e33	e21	e14	e16	45	101	295	245	84	19	16
29	55	e39	e21	e8.9	---	47	93	279	227	79	19	16
30	61	e32	e21	e18	---	46	143	274	204	74	18	15
31	60	---	e14	e23	---	46	---	259	---	71	18	---
TOTAL	1,508	1,361	864	441.3	659	1,382	2,951	20,274	8,513	5,938	1,139	523
MEAN	48.6	45.4	27.9	14.2	23.5	44.6	98.4	654	284	192	36.7	17.4
MAX	72	58	44	29	39	143	241	1,750	652	485	67	25
MIN	30	28	14	5.5	13	14	44	259	172	71	18	14
AC-FT	2,990	2,700	1,710	875	1,310	2,740	5,850	40,210	16,890	11,780	2,260	1,040
CFSM	0.16	0.15	0.09	0.05	0.08	0.15	0.32	2.16	0.94	0.63	0.12	0.06
IN.	0.19	0.17	0.11	0.05	0.08	0.17	0.36	2.49	1.05	0.73	0.14	0.06

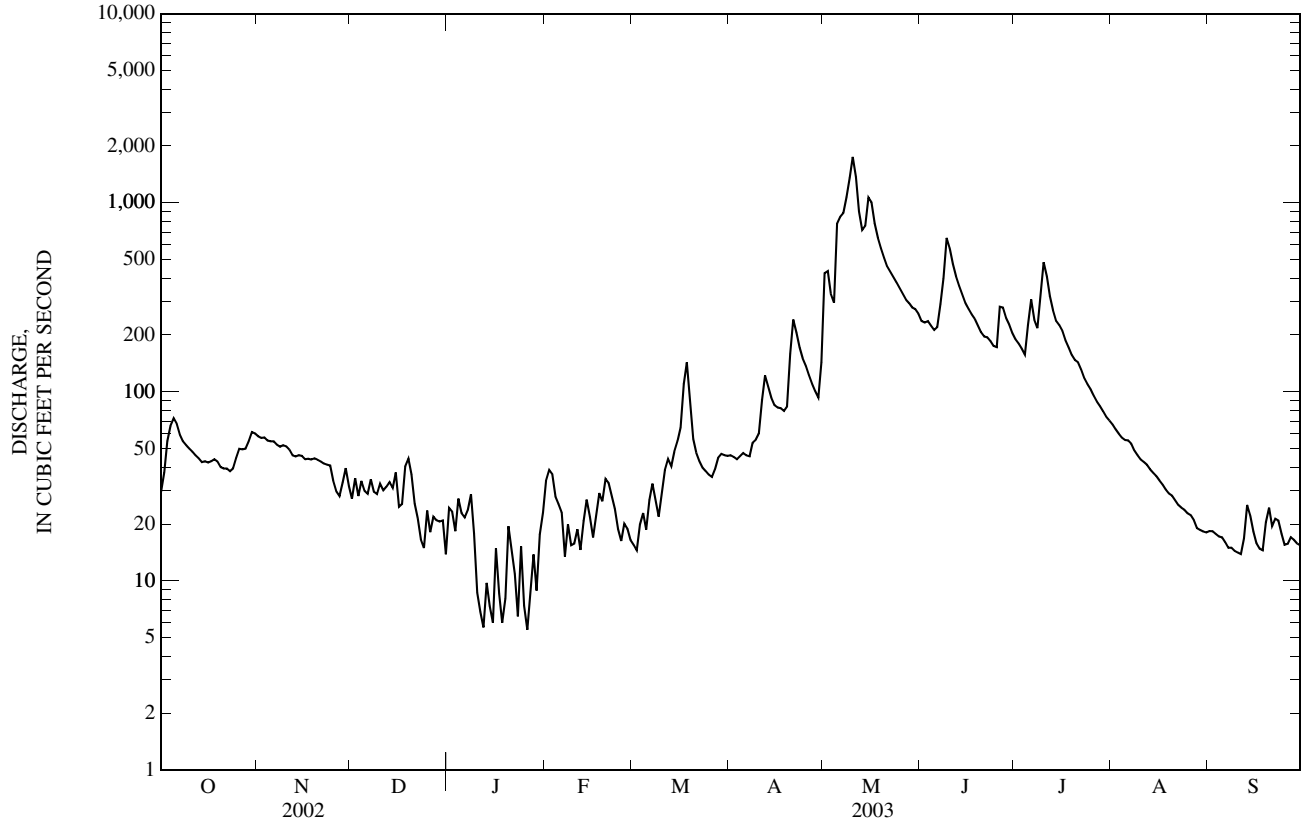
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2003, BY WATER YEAR (WY)

MEAN	97.2	108	86.0	69.8	142	369	314	284	325	253	125	87.8
MAX	440	359	418	463	564	1,280	1,173	1,036	1,403	1,705	1,134	735
(WY)	(1966)	(1973)	(1983)	(1973)	(1984)	(1993)	(1991)	(1991)	(1990)	(1993)	(1993)	(1965)
MIN	5.37	7.45	3.78	2.34	3.07	15.9	20.5	22.9	10.2	5.33	2.38	7.18
(WY)	(1990)	(1956)	(1990)	(1956)	(1956)	(1954)	(1956)	(1977)	(1956)	(1989)	(1989)	(1989)

05463500 BLACK HAWK CREEK AT HUDSON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1953 - 2003	
ANNUAL TOTAL	30,413		45,553.3			
ANNUAL MEAN	83.3		125		189	
HIGHEST ANNUAL MEAN					697	1993
LOWEST ANNUAL MEAN					18.4	1956
HIGHEST DAILY MEAN	899	Aug 23	1,750	May 10	11,300	Jul 9, 1969
LOWEST DAILY MEAN	14	Dec 31	5.5	Jan 26a	0.12	Jan 26, 1977
ANNUAL SEVEN-DAY MINIMUM	20	Dec 22	8.4	Jan 12	0.32	Jan 23, 1977
MAXIMUM PEAK FLOW			1,790	May 10	19,300	Jul 9, 1969
MAXIMUM PEAK STAGE			13.19	May 10	18.23	Jul 9, 1969
ANNUAL RUNOFF (AC-FT)	60,320		90,350		136,600	
ANNUAL RUNOFF (CFSM)	0.27		0.41		0.62	
ANNUAL RUNOFF (INCHES)	3.73		5.59		8.45	
10 PERCENT EXCEEDS	163		313		434	
50 PERCENT EXCEEDS	55		44		76	
90 PERCENT EXCEEDS	30		16		15	

a Ice affected.
e Estimated.



05464000 CEDAR RIVER AT WATERLOO, IA

LOCATION.--Lat 42°29'44", long 92°20'03", in NW¼ NW¼ sec.25, T.89 N., R.13 W., Black Hawk County, Hydrologic Unit 07080205, on left bank at foot of East Seventh Street, 0.3 mi upstream from Eleventh Street bridge in Waterloo, 1.1 mi downstream from Black Hawk Creek, and at mile 187.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--5,146 mi^2.

PERIOD OF RECORD.--October 1940 to current year. Prior to April 1941, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1950.

GAGE.--Water-stage recorder. Datum of gage is 824.14 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Slight diurnal fluctuation during low flow caused by powerplant upstream from station. U.S. National Weather Service Limited Automatic Remote Collector (LARC) and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 16, 1929, reached a stage of about 20 ft, determined by U. S. Army Corps of Engineers, from information by City of Waterloo, discharge, 65,000 ft^3/s. Flood of Apr. 2, 1933, reached a stage of about 19.5 ft from information by City of Waterloo, discharge, 61,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,160	2,140	e1,000	e944	e670	e758	2,720	3,640	3,680	6,000	2,660	1,230
2	1,290	2,060	e1,060	e917	e789	e749	2,500	4,070	3,560	5,340	2,650	1,220
3	1,360	2,080	e971	e849	e772	754	2,330	3,990	3,500	4,690	2,580	1,210
4	1,490	2,080	e1,010	e872	e765	762	2,310	4,020	3,430	4,450	2,420	1,180
5	1,700	2,050	e969	e863	e759	e741	2,290	4,560	3,360	4,710	2,390	1,150
6	3,260	2,010	e955	e914	e758	748	2,230	7,140	3,490	4,910	2,320	1,130
7	4,330	1,980	e1,160	e974	e744	e758	2,300	10,300	3,680	5,680	2,290	1,100
8	4,210	1,960	e1,140	e982	e772	754	2,310	12,300	4,780	6,420	2,240	1,070
9	4,090	1,970	e1,100	e1,000	e765	e753	2,340	14,000	7,150	8,000	2,270	1,070
10	3,710	1,940	1,170	e804	e754	e757	2,350	14,700	8,450	10,400	1,990	1,030
11	3,390	2,010	1,300	e679	e784	761	2,400	16,000	8,580	11,800	1,980	1,010
12	3,110	1,680	1,330	e716	e779	776	2,740	15,400	8,060	12,700	2,020	1,120
13	2,880	1,700	1,330	e691	e782	793	3,270	14,800	7,170	11,600	2,010	1,120
14	2,710	1,760	1,310	e717	e791	851	3,550	15,300	6,570	9,070	1,950	1,140
15	2,590	1,730	1,300	e801	e785	990	3,490	15,400	5,910	7,740	1,910	1,070
16	2,560	1,700	1,280	e829	e779	1,220	3,420	14,100	5,410	6,860	1,870	1,040
17	2,460	1,650	1,250	e795	e784	1,520	3,320	12,800	4,860	6,390	1,820	1,000
18	2,450	1,650	1,320	e806	e759	1,730	3,320	11,600	4,640	5,960	1,780	1,020
19	2,350	1,650	1,340	e778	e752	1,900	3,630	e9,640	4,300	5,390	1,710	1,050
20	2,340	1,610	e1,330	e753	e747	1,960	3,870	8,460	4,080	4,930	1,680	1,030
21	2,270	1,610	e1,290	e763	e780	1,880	4,380	7,460	3,840	4,620	1,640	1,030
22	2,290	1,590	e1,200	e749	e833	1,830	4,870	6,730	3,640	4,470	1,580	1,040
23	2,200	1,560	e1,020	e686	e853	1,710	4,950	6,210	3,480	4,150	1,520	1,020
24	2,210	1,550	e990	e651	e842	1,630	4,680	5,860	3,400	3,910	1,480	988
25	2,240	1,510	e934	e630	e837	1,560	4,330	5,470	3,670	3,680	1,450	913
26	2,230	1,450	e903	e614	e814	1,550	4,030	5,070	4,770	3,500	1,430	912
27	2,380	e1,380	e943	e595	e800	1,570	3,750	4,780	6,720	3,320	1,390	886
28	2,360	e1,250	e925	e617	e773	1,600	3,510	4,490	7,500	3,160	1,380	874
29	2,180	e1,160	e901	e599	---	1,750	3,310	4,240	7,100	3,030	1,380	857
30	2,180	e1,200	e985	e613	---	2,350	3,550	3,990	6,590	2,900	1,310	845
31	2,200	---	e934	e632	---	2,840	---	3,880	---	2,820	1,270	---
TOTAL	78,180	51,670	34,650	23,833	21,822	40,305	98,050	270,400	155,370	182,600	58,370	31,355
MEAN	2,522	1,722	1,118	769	779	1,300	3,268	8,723	5,179	5,890	1,883	1,045
MAX	4,330	2,140	1,340	1,000	853	2,840	4,950	16,000	8,580	12,700	2,660	1,230
MIN	1,160	1,160	901	595	670	741	2,230	3,640	3,360	2,820	1,270	845
AC-FT	155,100	102,500	68,730	47,270	43,280	79,940	194,500	536,300	308,200	362,200	115,800	62,190
CFSM	0.49	0.33	0.22	0.15	0.15	0.25	0.64	1.70	1.01	1.14	0.37	0.20
IN.	0.57	0.37	0.25	0.17	0.16	0.29	0.71	1.95	1.12	1.32	0.42	0.23

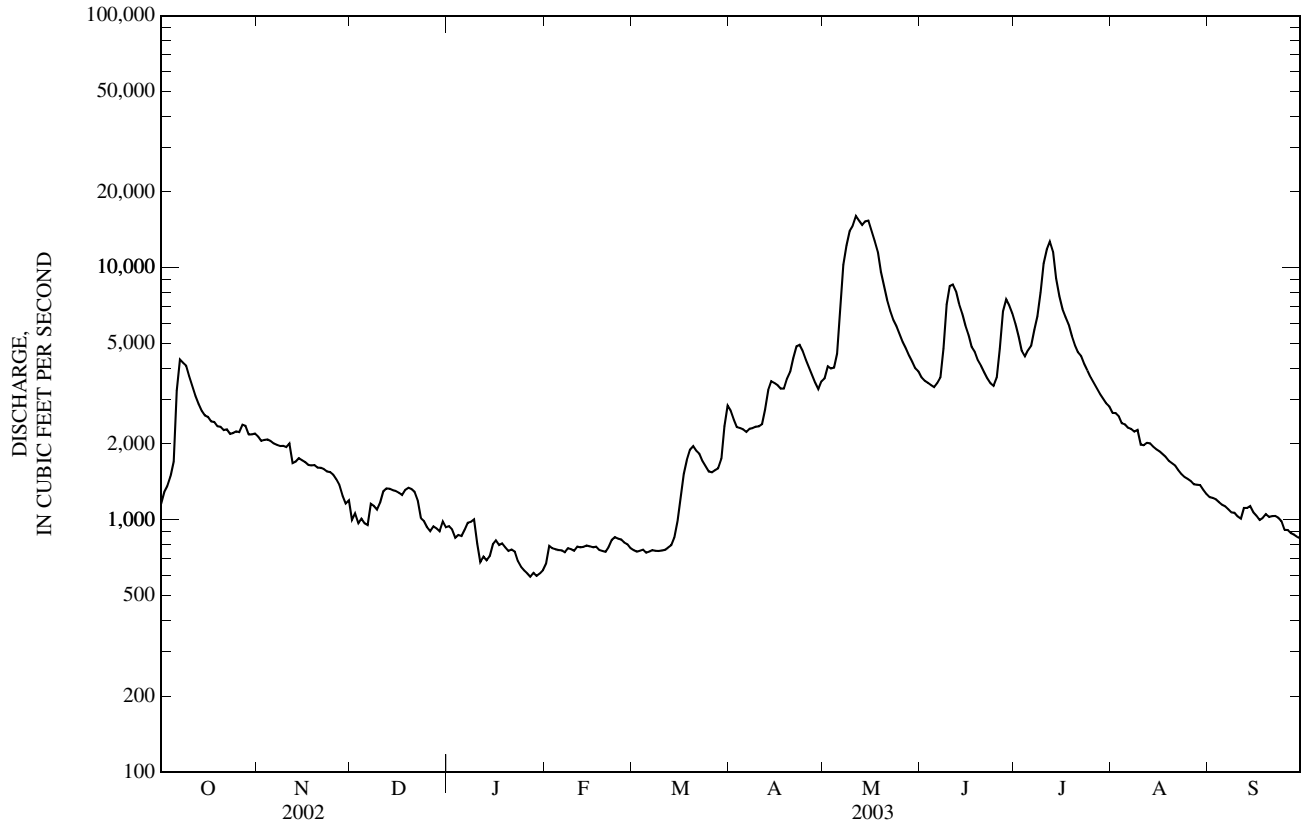
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	2,111	2,050	1,534	1,220	1,764	5,463	6,325	4,867	5,403	4,132	2,713	2,023
MAX	8,499	7,434	6,891	5,479	9,448	13,760	24,940	19,010	18,320	21,210	18,770	9,258
(WY)	(1987)	(1973)	(1983)	(1973)	(1984)	(1973)	(1993)	(1991)	(1993)	(1993)	(1993)	(1993)
MIN	364	370	266	252	188	687	741	732	474	455	328	387
(WY)	(1990)	(1990)	(1990)	(1959)	(1959)	(1964)	(1957)	(1977)	(1977)	(1989)	(1989)	(1955)

05464000 CEDAR RIVER AT WATERLOO, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	793,825		1,046,605			
ANNUAL MEAN	2,175		2,867		3,305	
HIGHEST ANNUAL MEAN					10,580	1993
LOWEST ANNUAL MEAN					636	1977
HIGHEST DAILY MEAN	7,790	Aug 8	16,000	May 11	74,000	Mar 29, 1961
LOWEST DAILY MEAN	781	Mar 4	595	Jan 27a	152	Jan 28, 1959
ANNUAL SEVEN-DAY MINIMUM	931	Feb 1	614	Jan 25	173	Feb 13, 1959
MAXIMUM PEAK FLOW			16,200	May 11	76,700	Mar 29, 1961
MAXIMUM PEAK STAGE			10.01	May 11	21.86	Mar 29, 1961
ANNUAL RUNOFF (AC-FT)	1,575,000		2,076,000		2,394,000	
ANNUAL RUNOFF (CFSM)	0.42		0.56		0.64	
ANNUAL RUNOFF (INCHES)	5.74		7.57		8.73	
10 PERCENT EXCEEDS	3,760		6,400		7,570	
50 PERCENT EXCEEDS	1,840		1,780		1,790	
90 PERCENT EXCEEDS	1,010		765		570	

a Ice affected.
e Estimated.



05464220 WOLF CREEK NEAR DYSART, IA

LOCATION.--Lat 42°15'06", long 92°17'55", in SE¼ NE¼ NE¼ sec.24, T.86 N., R.13 W., Tama County, Hydrologic Unit 07080205, on bank 20 ft upstream of right bank side of bridge on County Highway V37, 10.0 miles upstream of confluence with the Cedar River, and 5.0 miles north of Dysart.

DRAINAGE AREA.--299 mi^2.

PERIOD OF RECORD.--October 24, 1995 to September 30, 1998. May 16, 2001 to current year.

GAGE.--Water stage recorder. Datum of gage is 835 ft above NGVD of 1929, from map.

REMARKS.--Records good except those for estimated daily discharges, which is poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	36	e29	e22	e21	e21	29	183	207	256	83	23
2	36	35	e27	e20	e23	e19	30	224	203	238	76	22
3	49	35	e26	e19	e22	e19	29	194	207	222	70	22
4	55	35	e27	e18	e22	e18	29	172	199	206	66	20
5	50	36	e24	e17	e21	e21	31	239	191	225	65	20
6	45	38	e21	e17	e20	e18	28	395	198	273	64	19
7	38	36	e24	e18	e18	e17	27	376	253	267	63	19
8	35	35	e20	e20	e19	e16	33	519	310	251	58	19
9	34	35	e19	e18	e18	e15	33	1,200	462	321	54	18
10	33	35	e22	e13	e18	e16	34	1,160	432	457	51	17
11	32	34	e21	e14	e18	e16	46	1,170	380	383	50	17
12	30	31	e27	e16	e18	e19	58	673	339	312	47	24
13	27	31	e26	e16	e17	e26	53	529	315	271	45	34
14	26	31	e29	e16	e18	e72	47	553	292	245	45	35
15	27	31	e31	e14	e17	e103	44	1,040	272	233	43	23
16	28	30	e28	e16	e17	95	44	914	256	214	42	19
17	29	29	32	e15	e17	92	43	642	246	198	40	16
18	31	30	36	e17	e17	82	41	538	234	186	36	16
19	29	32	43	e17	e16	69	43	473	222	174	35	21
20	26	31	37	e18	e15	52	53	423	207	164	33	23
21	25	31	e31	e19	e16	43	72	380	198	161	32	22
22	25	30	e26	e22	e28	38	78	357	191	151	31	24
23	25	30	e12	e18	e37	35	74	333	183	135	31	23
24	27	30	e18	e18	e38	34	66	313	175	126	32	20
25	34	24	e22	e18	e34	32	63	294	195	120	30	16
26	36	e22	e24	e18	e23	30	59	275	357	113	33	16
27	36	e18	e19	e16	e20	32	55	261	414	108	29	17
28	34	e23	e22	e17	e21	35	53	252	342	102	27	16
29	35	e28	e24	e18	---	34	49	240	315	97	26	15
30	38	e24	e26	e19	---	31	67	233	280	91	24	14
31	38	---	e25	e20	---	29	---	221	---	87	22	---
TOTAL	1,034	926	798	544	589	1,179	1,411	14,776	8,075	6,387	1,383	610
MEAN	33.4	30.9	25.7	17.5	21.0	38.0	47.0	477	269	206	44.6	20.3
MAX	55	38	43	22	38	103	78	1,200	462	457	83	35
MIN	21	18	12	13	15	15	27	172	175	87	22	14
AC-FT	2,050	1,840	1,580	1,080	1,170	2,340	2,800	29,310	16,020	12,670	2,740	1,210
CFSM	0.11	0.10	0.09	0.06	0.07	0.13	0.16	1.59	0.90	0.69	0.15	0.07
IN.	0.13	0.12	0.10	0.07	0.07	0.15	0.18	1.84	1.00	0.79	0.17	0.08

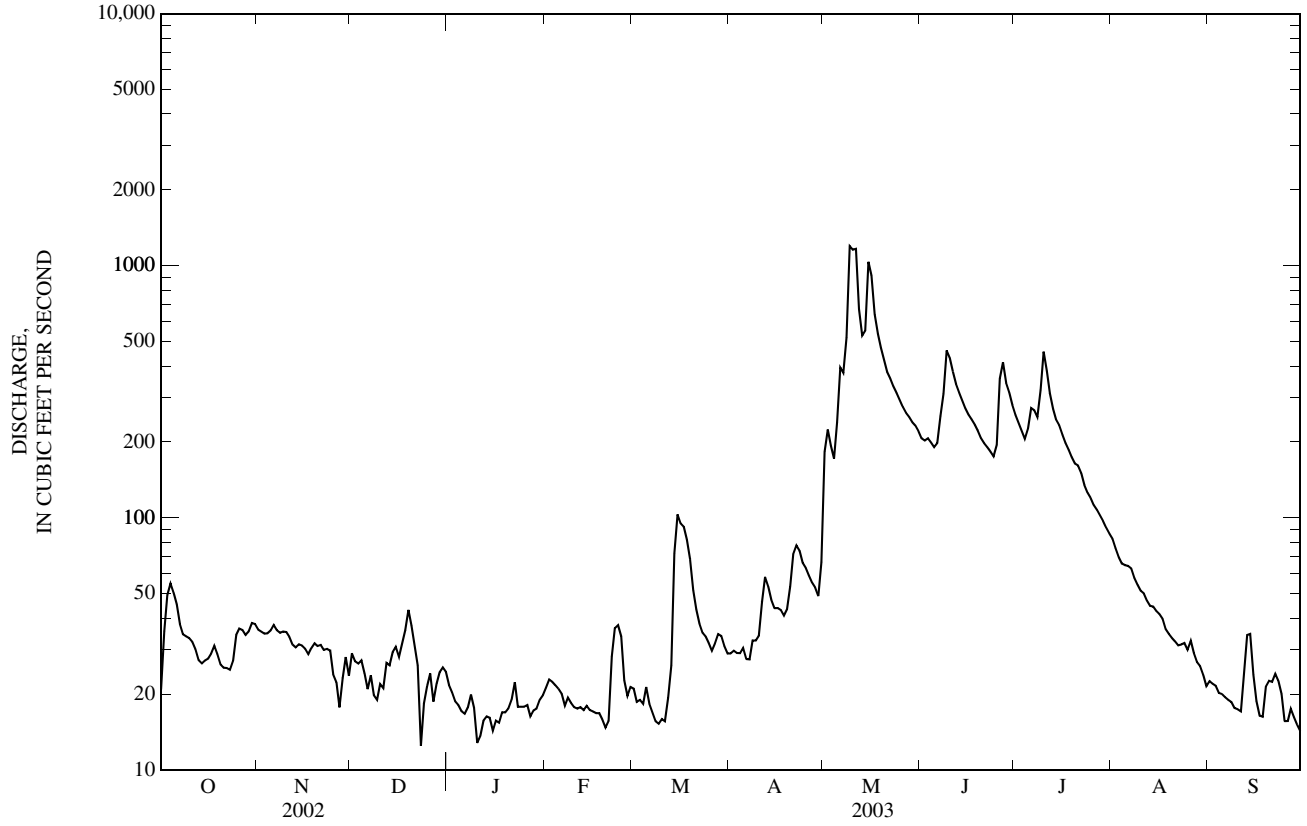
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2003, BY WATER YEAR (WY)

MEAN	104	59.0	55.5	42.6	179	158	199	286	553	215	73.9	36.5
MAX	267	101	119	92.6	513	440	695	477	1,773	584	163	62.9
(WY)	(1999)	(1997)	(1998)	(1998)	(1997)	(1998)	(1998)	(2003)	(1998)	(1998)	(1998)	(1998)
MIN	31.4	29.6	17.2	13.4	21.0	34.5	43.7	121	116	52.5	44.6	20.4
(WY)	(2002)	(2002)	(1996)	(2002)	(2003)	(2002)	(2002)	(2002)	(2002)	(2002)	(2003)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1995 - 2003	
ANNUAL TOTAL	18,590.4		37,712			
ANNUAL MEAN	50.9		103		179	
HIGHEST ANNUAL MEAN					394	1998
LOWEST ANNUAL MEAN					50.1	2002
HIGHEST DAILY MEAN	587	Aug 23	1,200	May 9	4,810	Jun 12, 1998
LOWEST DAILY MEAN	7.1	Jan 15	12	Dec 23a	7.1	Jan 15, 2002a
ANNUAL SEVEN-DAY MINIMUM	8.8	Jan 13	15	Jan 10	8.8	Jan 13, 2002
MAXIMUM PEAK FLOW			1,560	May 9	5,800	Jun 12, 1998
MAXIMUM PEAK STAGE			6.50	May 9	13.33	Jun 12, 1998
INSTANTANEOUS LOW FLOW					18	Oct 19, 1996
ANNUAL RUNOFF (AC-FT)	36,870		74,800		129,500	
ANNUAL RUNOFF (CFSM)	0.17		0.35		0.60	
ANNUAL RUNOFF (INCHES)	2.31		4.69		8.12	
10 PERCENT EXCEEDS	111		277		375	
50 PERCENT EXCEEDS	33		33		72	
90 PERCENT EXCEEDS	18		17		20	

05464220 WOLF CREEK NEAR DYSART, IA—Continued

a Ice affected
e Estimated



05464500 CEDAR RIVER AT CEDAR RAPIDS, IA

LOCATION.--Lat 41°58'14", long 91°40'01", in SE$^1/_4$ NW$^1/_4$ sec.28, T.83 N., R.7 W., Linn County, Hydrologic Unit 07080205, on right bank 400 ft upstream from bridge on Eighth Avenue in Cedar Rapids, 2.7 mi upstream from Prairie Creek, and at mile 112.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--6,510 mi^2.

PERIOD OF RECORD.--October 1902 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: 1924. WSP 1308: 1904, 1906-13, 1915, 1917, 1919-24, 1928, 1930,. WSP 1438: Drainage area. WSP 1558: 1915-18 (M), 1920 (M), 1922 (M), 1929, 1933, 1943.

GAGE.--Water-stage recorder. Datum of gage is 700.47 ft above NGVD of 1929. Prior to Aug. 20, 1920, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow affected by city hydroelectric dam 0.5 mile upstream since June 1979. U. S. Army Corps of Engineers rain gage and satellite data collection platform and U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1851 reached a stage of about 20 ft, discharge, 65,000 ft^3/s, estimated.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,660	2,300	1,330	e1,110	e713	e782	2,210	6,110	4,630	6,920	2,690	1,190
2	2,680	2,280	1,500	e1,010	e764	e870	2,560	5,250	4,540	6,420	2,560	1,160
3	2,320	2,170	1,210	e991	e821	e786	2,340	4,950	4,340	5,810	2,510	1,080
4	2,220	2,180	1,090	e1,010	e867	e760	2,170	4,870	4,220	5,150	2,370	1,130
5	2,210	2,180	1,060	e994	e851	e756	2,030	4,970	4,060	4,870	2,310	1,060
6	2,140	2,210	1,020	e1,120	e752	e658	1,950	5,260	4,080	4,970	2,190	1,060
7	2,780	2,160	1,110	e1,170	e715	e625	1,970	6,910	4,360	5,120	2,130	1,020
8	4,350	2,160	1,520	e1,230	e701	e778	1,950	9,840	4,730	5,820	2,070	1,010
9	4,900	2,150	1,530	e1,270	e752	e1,080	1,910	12,000	5,720	6,910	2,020	986
10	4,900	2,130	1,390	e902	e729	e967	1,900	13,800	7,220	7,890	2,020	963
11	4,580	2,160	1,470	e328	e644	e776	1,920	15,800	8,770	9,480	1,980	983
12	4,270	2,100	1,650	e326	e672	757	1,960	17,700	9,240	10,600	1,760	937
13	3,920	2,130	1,820	e358	e646	1,000	2,090	18,800	9,100	11,500	1,770	1,440
14	3,620	1,850	1,840	e792	e619	991	2,500	18,200	8,280	11,900	1,760	1,430
15	3,370	1,930	e1,770	e914	e646	1,070	2,950	18,700	7,490	10,800	1,730	1,110
16	3,140	1,940	e1,710	e943	e666	1,310	3,010	19,500	6,780	8,640	1,680	1,100
17	3,050	1,900	e1,610	e918	e691	2,030	3,040	19,400	6,160	7,270	1,650	1,020
18	2,890	1,860	e1,690	e880	e646	1,970	2,920	17,500	5,880	6,640	1,600	1,040
19	2,800	1,850	e1,710	e861	e623	1,850	2,990	15,200	5,770	6,140	1,570	1,000
20	2,690	1,850	e1,700	e839	e621	1,930	3,250	13,400	5,050	5,660	1,490	1,050
21	2,610	1,880	e1,600	e853	e660	1,980	3,590	11,500	4,700	6,110	1,460	1,050
22	2,490	1,820	e1,510	e819	e678	1,900	3,810	9,890	4,410	5,290	1,510	1,070
23	2,460	1,850	e1,330	e739	e831	1,760	4,380	8,690	4,160	4,770	1,350	1,040
24	2,440	1,800	e1,100	e672	e821	1,710	4,620	7,830	3,910	4,320	1,380	1,020
25	2,420	1,770	e822	e642	e794	1,620	4,520	7,250	4,230	4,100	1,330	1,000
26	2,570	1,770	e703	e666	e778	1,530	4,250	6,750	4,240	3,780	1,480	987
27	2,340	1,680	e700	e636	e766	1,450	3,980	6,200	4,810	3,560	1,320	1,000
28	2,400	1,600	e729	e642	e762	1,500	3,710	5,830	6,530	3,290	1,250	926
29	2,520	1,740	e810	e642	---	1,460	3,480	5,420	7,440	3,150	1,250	922
30	2,400	1,630	e1,020	e646	---	1,450	4,220	5,150	7,460	2,920	1,220	897
31	2,290	---	e1,180	e670	---	1,540	---	4,900	---	2,780	1,170	---
TOTAL	91,430	59,030	41,234	25,593	20,229	39,646	88,180	327,570	172,310	192,580	54,580	31,681
MEAN	2,949	1,968	1,330	826	722	1,279	2,939	10,570	5,744	6,212	1,761	1,056
MAX	4,900	2,300	1,840	1,270	867	2,030	4,620	19,500	9,240	11,900	2,690	1,440
MIN	1,660	1,600	700	326	619	625	1,900	4,870	3,910	2,780	1,170	897
MED	2,610	1,910	1,390	853	714	1,310	2,930	8,690	4,930	5,810	1,680	1,030
AC-FT	181,400	117,100	81,790	50,760	40,120	78,640	174,900	649,700	341,800	382,000	108,300	62,840
CFSM	0.45	0.30	0.20	0.13	0.11	0.20	0.45	1.62	0.88	0.95	0.27	0.16
IN.	0.52	0.34	0.24	0.15	0.12	0.23	0.50	1.87	0.98	1.10	0.31	0.18

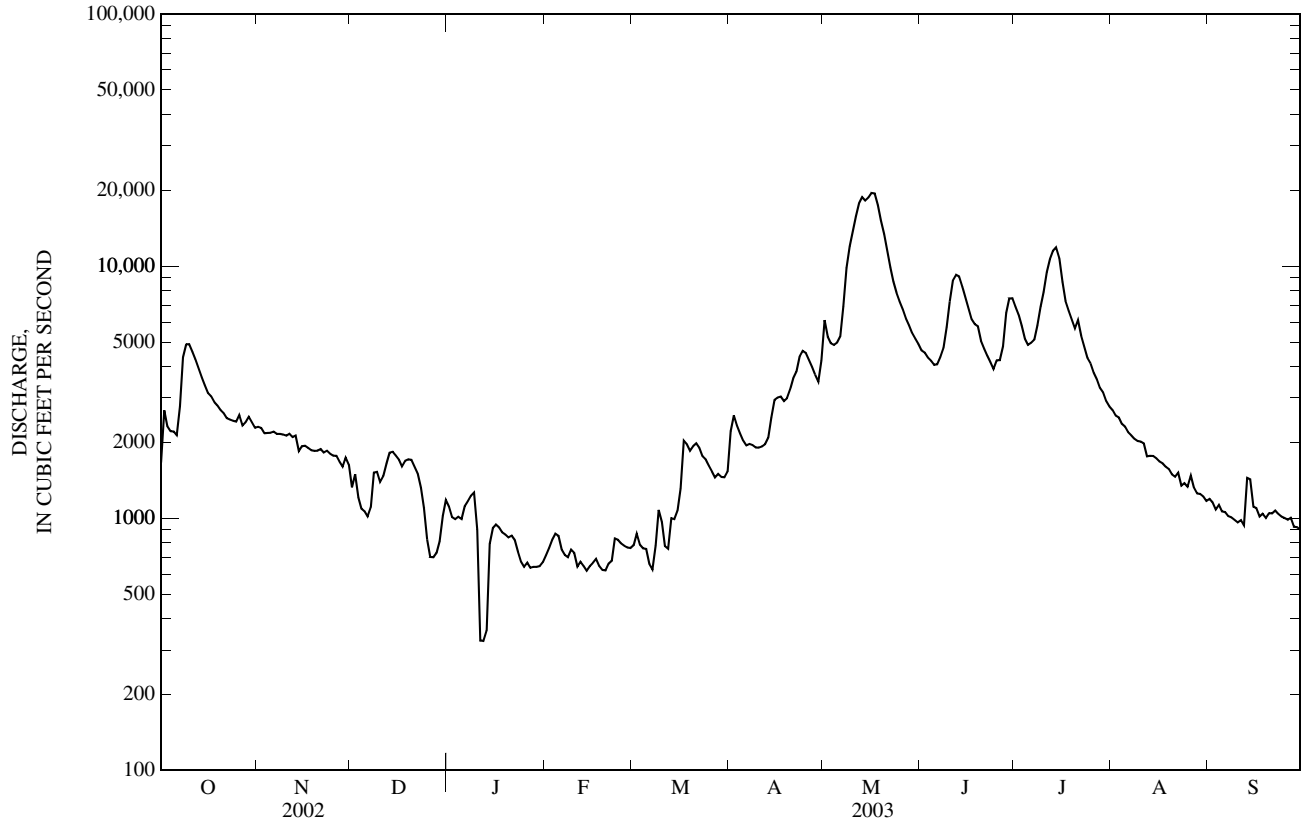
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 2003, BY WATER YEAR (WY)

MEAN	2,356	2,418	1,857	1,574	2,469	6,597	6,873	5,389	5,908	4,315	3,004	2,386
MAX	10,570	9,327	8,675	8,529	12,230	17,420	35,320	24,500	23,420	33,910	28,700	13,990
(WY)	(1987)	(1973)	(1983)	(1973)	(1984)	(1929)	(1993)	(1991)	(1947)	(1993)	(1993)	(1993)
MIN	463	410	290	299	304	664	1,045	527	350	533	377	466
(WY)	(1990)	(1990)	(1990)	(1911)	(1940)	(1934)	(1957)	(1934)	(1934)	(1989)	(1934)	(1934)

05464500 CEDAR RIVER AT CEDAR RAPIDS, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1903 - 2003	
ANNUAL TOTAL	991,261		1,144,063			
ANNUAL MEAN	2,716		3,134		3,765	
HIGHEST ANNUAL MEAN					15,130	1993
LOWEST ANNUAL MEAN					689	1934
HIGHEST DAILY MEAN	11,200	Jun 5	19,500	May 16	71,500	Mar 31, 1961
LOWEST DAILY MEAN	700	Dec 27	326	Jan 12a	140	Nov 18, 1989b
ANNUAL SEVEN-DAY MINIMUM	841	Dec 24	645	Feb 14	224	Dec 20, 1989
MAXIMUM PEAK FLOW			19,700	May 16	73,000	Mar 31, 1961
MAXIMUM PEAK STAGE			8.82	May 16	20.00	Mar 18, 1929
ANNUAL RUNOFF (AC-FT)	1,966,000		2,269,000		2,728,000	
ANNUAL RUNOFF (CFSM)	0.42		0.48		0.58	
ANNUAL RUNOFF (INCHES)	5.66		6.54		7.86	
10 PERCENT EXCEEDS	4,860		6,910		8,390	
50 PERCENT EXCEEDS	2,280		1,900		2,150	
90 PERCENT EXCEEDS	1,390		757		686	

a Ice affected
b Result of accidental gage operation at hydroelectric dam upstream.
e Estimated



05464942 HOOVER CREEK AT HOOVER NATIONAL HISTORIC SITE AT WEST BRANCH, IA

LOCATION.--Lat 41°40'10", long 91°21'02", in NW¼ NE¼ NE¼ sec.7, T.79 N., R.4 W., Cedar County, Hydrologic Unit 07080206, on right bank, at footbridge about 0.25 mi upstream of Hoover Presidental Library, at Hoover National Historic Site, at West Branch.

DRAINAGE AREA.--2.58 mi^2.

PERIOD OF RECORD.--April 27, 2000 to current year.

GAGE.--Water-stage recorder. Datum of gage is 704.890 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1967 reached a stage of 6.52 ft , discharge 1,500 ft^3/s from indirect discharge measurement, based on floodmarks at Downey Street bridge 1,100 ft downstream; flood of August 16, 1993 reached a stage of 10.41 ft, discharge 1,650 ft^3/s from indirect discharge measurement, based on floodmarks at Hoover National Historic Site.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.6	0.65	0.54	e0.38	e0.27	0.44	0.96	1.2	0.82	0.46	0.03
2	6.3	1.7	0.72	0.53	e0.34	e0.28	0.41	0.98	1.2	0.80	0.43	0.01
3	3.6	1.6	0.67	0.52	e0.31	e0.30	0.42	0.99	1.2	0.78	0.41	0.01
4	17	1.5	0.66	0.52	e0.23	e0.31	0.40	1.7	1.6	0.74	0.36	0.00
5	5.9	1.5	0.64	0.51	e0.17	0.25	0.37	4.5	1.4	0.77	0.34	0.00
6	4.4	1.4	0.63	0.49	e0.16	0.24	0.37	3.0	1.6	0.87	0.33	0.00
7	3.6	1.1	0.63	0.50	e0.10	0.25	0.42	2.3	1.5	0.85	0.28	0.00
8	3.1	0.93	0.57	0.52	e0.16	0.26	0.38	3.1	1.6	3.0	0.26	0.00
9	2.8	0.92	0.60	0.53	e0.12	0.23	0.39	12	1.6	1.7	0.24	0.00
10	2.5	0.89	0.60	0.51	e0.12	0.23	0.38	5.9	2.1	1.3	0.21	0.00
11	2.3	0.86	0.59	e0.48	e0.16	e0.50	0.35	4.6	2.0	1.1	0.20	0.00
12	2.2	0.83	0.60	e0.46	e0.18	e12	0.32	3.7	1.9	1.0	0.20	0.00
13	2.0	0.79	0.57	e0.46	e0.16	9.3	0.31	3.3	1.8	0.94	0.18	1.2
14	1.9	0.77	0.53	e0.45	e0.14	0.80	0.31	3.1	1.6	0.89	0.15	0.40
15	1.9	0.72	0.52	e0.45	e0.17	0.79	0.29	3.9	1.5	0.84	0.13	0.09
16	1.7	0.69	0.51	e0.48	e0.12	0.83	0.33	3.1	1.4	0.80	0.10	0.05
17	1.7	0.66	0.53	e0.47	e0.10	0.69	0.33	2.7	1.4	0.76	0.08	0.03
18	1.7	0.66	0.72	e0.46	e0.11	0.61	0.32	2.4	1.4	0.74	0.08	0.05
19	1.5	0.61	0.64	e0.49	e0.15	0.58	0.51	2.2	1.3	0.70	0.03	0.12
20	1.5	0.59	0.60	e0.50	e0.47	0.54	0.61	2.0	1.3	0.69	0.03	0.03
21	1.4	0.60	0.61	e0.40	e0.67	0.47	0.60	1.9	1.3	3.2	0.03	0.09
22	1.4	0.61	0.60	e0.33	e0.61	0.45	0.55	1.8	1.2	0.89	0.02	0.05
23	1.3	0.53	0.58	e0.22	e0.45	0.41	0.53	1.8	1.2	0.77	0.02	0.04
24	1.5	0.50	0.57	e0.16	e0.30	0.43	0.52	1.6	1.2	0.71	0.02	0.02
25	1.8	0.48	0.56	e0.16	e0.27	0.43	0.48	1.5	2.5	0.63	0.02	0.01
26	1.6	0.48	0.57	e0.11	e0.22	0.44	0.45	1.5	1.5	0.60	0.02	0.01
27	1.5	0.46	0.55	e0.10	e0.56	0.46	0.43	1.4	1.0	0.76	0.03	0.01
28	1.6	0.45	0.55	e0.17	e0.27	0.49	0.44	1.5	0.98	0.62	0.01	0.01
29	1.5	0.47	0.54	e0.21	---	0.45	0.49	1.3	0.90	0.58	0.01	0.01
30	1.5	0.61	0.56	e0.24	---	0.44	0.99	1.3	0.85	0.52	0.00	0.01
31	1.5	---	0.53	e0.30	---	0.45	---	1.2	---	0.50	0.02	---
TOTAL	85.4	25.51	18.40	12.27	7.20	34.18	13.14	83.23	43.23	29.87	4.70	2.28
MEAN	2.75	0.85	0.59	0.40	0.26	1.10	0.44	2.68	1.44	0.96	0.15	0.076
MAX	17	1.7	0.72	0.54	0.67	12	0.99	12	2.5	3.2	0.46	1.2
MIN	1.2	0.45	0.51	0.10	0.10	0.23	0.29	0.96	0.85	0.50	0.00	0.00
AC-FT	169	51	36	24	14	68	26	165	86	59	9.3	4.5
CFSM	1.07	0.33	0.23	0.15	0.10	0.43	0.17	1.04	0.56	0.37	0.06	0.03
IN.	1.23	0.37	0.27	0.18	0.10	0.49	0.19	1.20	0.62	0.43	0.07	0.03

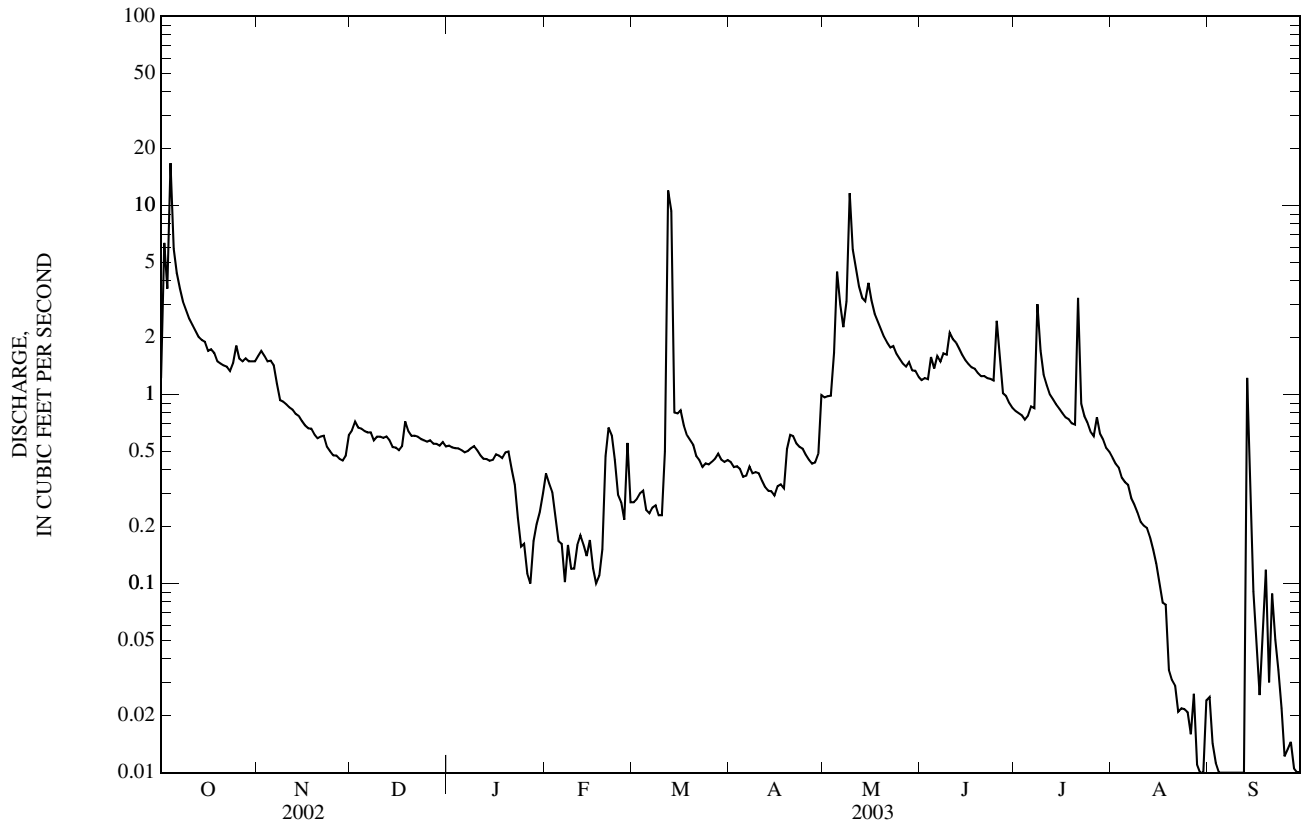
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2003, BY WATER YEAR (WY)

MEAN	1.34	0.64	0.49	0.46	2.82	2.81	2.57	4.89	3.40	1.57	0.88	0.24
MAX	2.75	0.85	0.65	0.54	7.46	5.28	3.92	7.60	5.51	2.26	2.89	0.49
(WY)	(2003)	(2003)	(2002)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2002)	(2002)	(2002)
MIN	0.28	0.38	0.22	0.40	0.26	1.10	0.44	2.68	1.44	0.96	0.15	0.076
(WY)	(2001)	(2001)	(2001)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)

05464942 HOOVER CREEK AT HOOVER NATIONAL HISTORIC SITE AT WEST BRANCH, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2000 - 2003	
ANNUAL TOTAL	737.11		359.41			
ANNUAL MEAN	2.02		0.98		1.84	
HIGHEST ANNUAL MEAN					2.68	2001
LOWEST ANNUAL MEAN					0.98	2003
HIGHEST DAILY MEAN	41	Aug 23	17	Oct 4	78	May 31, 2000
LOWEST DAILY MEAN	0.27	Jan 1	0.00	Aug 30a	0.00	Sep 5, 2001
ANNUAL SEVEN-DAY MINIMUM	0.32	Jan 13	0.00	Sep 4	0.00	Sep 4, 2003
MAXIMUM PEAK FLOW			80	Oct 4	207	May 31, 2000
MAXIMUM PEAK STAGE			4.35	Oct 4	7.45	Aug 23, 2002
INSTANTANEOUS LOW FLOW					0.00	Sep 4, 2001b
ANNUAL RUNOFF (AC-FT)	1,460		713		1,330	
ANNUAL RUNOFF (CFSM)	0.000		0.000		0.000	
ANNUAL RUNOFF (INCHES)	0.00		0.00		0.00	
10 PERCENT EXCEEDS	4.3		1.9		4.3	
50 PERCENT EXCEEDS	1.1		0.55		0.69	
90 PERCENT EXCEEDS	0.44		0.05		0.12	

a Also Sept. 4-12.
b Also Sept. 5, 6, 2001; Aug. 28-31, Sept. 4-13, 26, and Sept. 30, 2003.
e Estimated.



05465000 CEDAR RIVER NEAR CONESVILLE, IA

LOCATION.--Lat 41°24'36", long 91°17'06", in SW¼ SW¼ sec.2, T.76 N., R.4 W., Muscatine County, Hydrologic Unit 07080206, on right bank 10 ft downstream from bridge on county highway G28, 3.4 mi northeast of Conesville, 5.2 mi downstream from Wapsinonoc Creek, 10.7 mi upstream from mouth, and at mile 39.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--7,785 mi^2.

PERIOD OF RECORD.--September 1939 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 581.95 ft above NGVD of 1929. Prior to Feb. 2, 1940, and Apr. 11, 1952, to July 1, 1954, nonrecording gage, Feb. 2, 1940, to Apr. 10, 1952, and July 2, 1954, to Sept. 16, 1963, water-stage recorder, at site 150 ft downstream on left bank at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of 15.8 ft, from information by local residents to U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,770	2,990	2,340	2,310	e1,220	e1,250	2,150	4,560	6,070	8,210	3,410	1,550
2	2,100	2,950	2,290	2,320	e1,240	e1,320	2,360	7,480	5,740	7,680	3,310	1,510
3	4,250	2,950	2,160	2,150	e1,280	e1,310	2,710	7,530	5,590	7,280	3,180	1,490
4	4,900	2,920	2,240	1,980	e1,340	e1,220	2,790	6,180	5,480	6,720	3,090	1,460
5	4,960	2,870	2,080	1,900	e1,340	e1,210	2,680	6,160	5,320	6,070	3,030	1,410
6	3,970	2,860	2,000	1,880	e1,270	e1,150	2,560	6,440	5,190	5,640	2,890	1,430
7	3,470	2,860	2,010	1,910	e1,210	e1,080	2,490	6,570	5,160	5,600	2,790	1,420
8	3,280	2,830	2,060	2,010	e1,190	e1,150	2,460	7,330	5,390	5,780	2,710	1,410
9	3,980	2,810	e1,940	2,070	e1,290	e1,640	2,430	11,100	5,750	6,380	2,620	1,370
10	4,890	2,810	e1,880	e1,850	e1,270	e1,480	2,410	14,300	6,520	7,990	2,500	1,360
11	4,980	2,790	e1,960	e1,370	e1,220	e1,370	2,380	15,700	7,700	8,780	2,450	1,320
12	4,860	2,750	2,150	e1,130	e1,300	e1,330	2,380	16,900	9,380	9,840	2,450	1,360
13	4,570	2,740	2,160	e848	e1,300	e1,440	2,410	18,400	10,000	10,900	2,350	1,440
14	4,270	2,730	2,270	e1,120	e1,200	e1,410	2,460	19,800	10,000	11,700	2,220	1,640
15	4,020	2,680	2,370	e1,260	e1,170	e1,530	2,590	20,900	9,530	12,200	2,200	2,260
16	3,810	2,550	2,380	e1,300	e1,190	e1,790	2,880	20,900	8,670	11,600	2,180	1,830
17	3,640	2,590	2,400	e1,230	e1,200	2,250	3,070	21,500	7,800	10,000	2,110	1,520
18	3,520	2,560	2,410	e1,200	e1,130	2,420	3,160	21,700	7,120	8,480	2,050	1,460
19	3,440	2,550	2,440	e1,200	e1,060	2,820	3,140	21,100	6,650	7,610	1,990	1,430
20	3,300	2,520	2,530	e1,170	e1,030	2,620	3,220	18,600	6,710	7,020	1,920	1,420
21	3,220	2,510	2,510	e1,230	e1,030	2,620	3,400	15,900	6,140	6,860	1,890	1,390
22	3,120	2,500	2,370	e1,170	e1,070	2,650	3,550	13,400	5,560	7,440	1,840	1,380
23	3,060	2,490	2,340	e1,030	e1,280	2,650	3,650	11,700	5,290	6,440	1,790	1,370
24	3,020	2,470	e1,790	e1,060	e1,250	2,560	3,910	10,600	4,880	5,680	1,790	1,350
25	3,090	2,460	e1,390	e1,180	e1,210	2,490	4,270	9,670	4,740	5,180	1,670	1,330
26	3,150	2,420	e1,270	e1,140	e1,200	2,420	4,380	8,930	5,270	4,800	1,690	1,310
27	3,090	2,400	e1,380	e1,090	e1,190	2,330	4,250	8,220	5,690	4,540	1,710	1,290
28	3,160	2,370	e1,520	e1,140	e1,200	2,260	4,040	7,610	5,510	4,280	1,740	1,290
29	3,030	2,310	1,750	e1,110	---	2,220	3,870	7,180	6,740	3,980	1,640	1,270
30	3,100	2,370	1,800	e1,130	---	2,180	3,850	6,690	8,030	3,740	1,580	1,230
31	3,130	---	2,020	e1,190	---	2,140	---	6,400	---	3,590	1,590	---
TOTAL	112,150	79,610	64,210	44,678	33,880	58,310	91,900	379,450	197,620	222,010	70,380	43,300
MEAN	3,618	2,654	2,071	1,441	1,210	1,881	3,063	12,240	6,587	7,162	2,270	1,443
MAX	4,980	2,990	2,530	2,320	1,340	2,820	4,380	21,700	10,000	12,200	3,410	2,260
MIN	1,770	2,310	1,270	848	1,030	1,080	2,150	4,560	4,740	3,590	1,580	1,230
AC-FT	222,400	157,900	127,400	88,620	67,200	115,700	182,300	752,600	392,000	440,400	139,600	85,890
CFSM	0.46	0.34	0.27	0.19	0.16	0.24	0.39	1.57	0.85	0.92	0.29	0.19
IN.	0.54	0.38	0.31	0.21	0.16	0.28	0.44	1.81	0.94	1.06	0.34	0.21

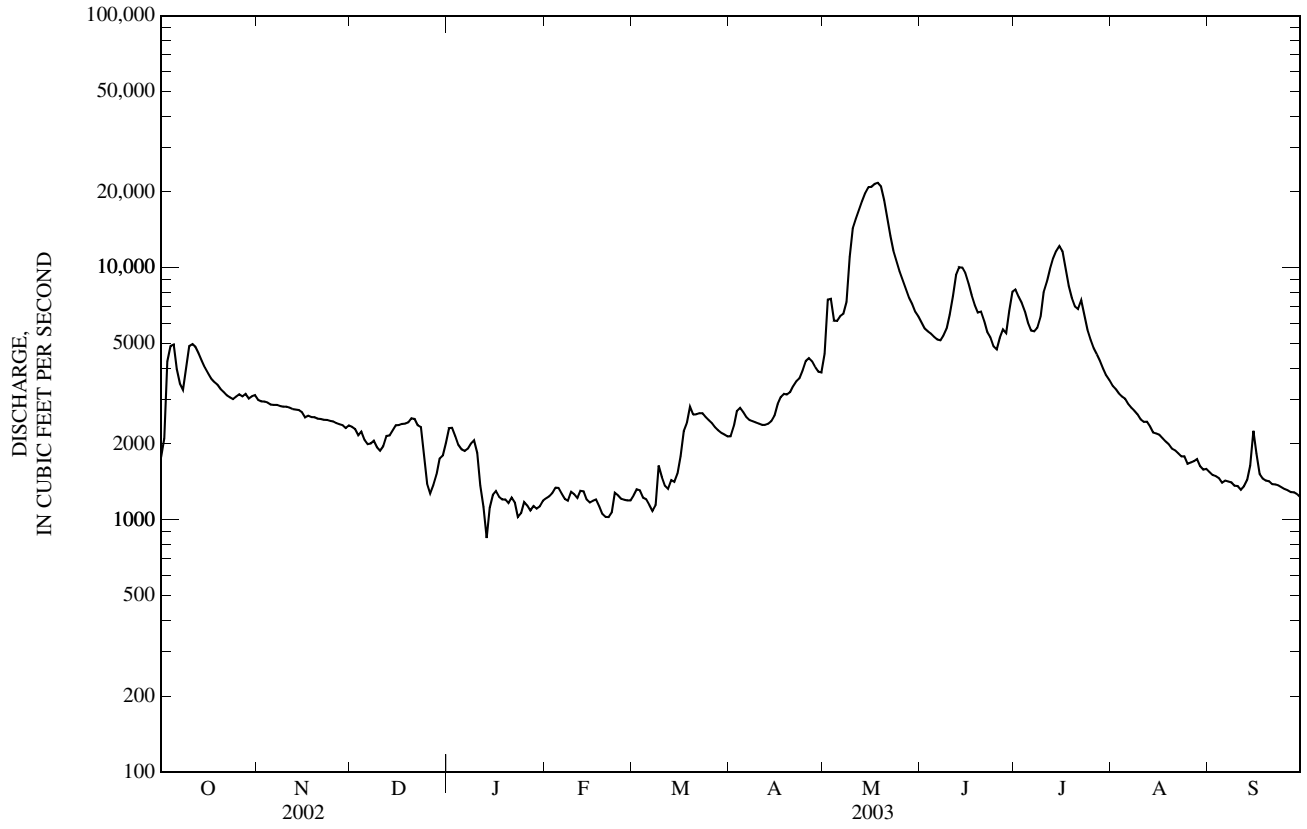
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

MEAN	3,114	3,287	2,575	2,357	3,207	7,893	9,502	7,725	8,282	6,518	4,194	3,245
MAX	12,380	10,240	11,110	11,860	12,000	17,590	36,790	24,440	27,780	42,110	34,190	19,530
(WY)	(1987)	(1973)	(1983)	(1973)	(1984)	(1948)	(1993)	(1991)	(1993)	(1993)	(1993)	(1993)
MIN	599	590	429	365	359	1,056	1,244	1,219	768	815	700	620
(WY)	(1957)	(1956)	(1990)	(1977)	(1940)	(1954)	(1957)	(1940)	(1977)	(1989)	(1989)	(1955)

05465000 CEDAR RIVER NEAR CONESVILLE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003	
ANNUAL TOTAL	1,325,990		1,397,498			
ANNUAL MEAN	3,633		3,829		5,163	
HIGHEST ANNUAL MEAN					18,710	1993
LOWEST ANNUAL MEAN					1,176	1956
HIGHEST DAILY MEAN	23,100	Jun 6	21,700	May 18	69,800	Apr 6, 1993
LOWEST DAILY MEAN	1,270	Dec 26	848	Jan 13a	250	Nov 28, 1955
ANNUAL SEVEN-DAY MINIMUM	1,460	Feb 3	1,100	Feb 16	329	Jan 30, 1940
MAXIMUM PEAK FLOW			21,900	May 18	74,000	Apr 6, 1993
MAXIMUM PEAK STAGE			13.37	May 18	17.11	Apr 6, 1993
ANNUAL RUNOFF (AC-FT)	2,630,000		2,772,000		3,740,000	
ANNUAL RUNOFF (CFSM)	0.47		0.49		0.66	
ANNUAL RUNOFF (INCHES)	6.33		6.68		9.01	
10 PERCENT EXCEEDS	6,180		7,740		11,900	
50 PERCENT EXCEEDS	2,950		2,490		3,120	
90 PERCENT EXCEEDS	1,760		1,220		950	

a Ice affected
e Estimated



05465500 IOWA RIVER AT WAPELLO, IA

LOCATION.--Lat 41°10'41", long 91°10'55", in NW¼ SE¼ sec.27, T.74 N., R.3 W., Louisa County, Hydrologic Unit 07080209, on right bank, 1200 ft. downstream from bridge on State Highway 99 at east edge of Wapello, 13.2 mi downstream from Cedar River, and at mile 15.8.

DRAINAGE AREA.--12,499 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1914 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1917, 1923-30, 1932. WSP 1438: Drainage area. WSP 1558: 1918, 1923-25 (M), 1929. WSP 1708: 1955(P), 1956. WDR IA-95-1:location.

GAGE.--Water-stage recorder. Datum of gage is 538.17 ft above NGVD of 1929; Oct. 1, 1914 to Apr. 15, 1934, nonrecording gage and Apr. 16, 1934 to Sept. 30, 1972, water-stage recorder at datum 10.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by Coralville Lake (station 05453510) 67.3 mi upstream, since Sept. 17, 1958. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum instantaneous discharge, 111,000 ft^3/s, July 8, 1993, gage height, 29.53 ft; minimum daily discharge, 300 ft^3/s, Nov. 28, 1955.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3,210	4,620	3,200	2,680	e1,750	e2,410	2,810	8,460	10,200	11,200	5,340	2,090
2	3,310	4,460	3,200	3,020	e1,820	e2,460	2,730	8,450	9,110	11,300	5,020	1,980
3	4,470	4,330	3,160	3,070	e1,900	e2,570	2,940	10,600	8,580	10,800	4,790	1,880
4	10,900	4,270	3,070	2,920	e1,970	e2,610	3,300	10,900	8,310	10,400	4,520	1,810
5	11,400	4,190	3,170	2,730	e2,060	e2,280	3,380	11,400	8,060	9,770	4,320	1,780
6	9,310	3,940	3,210	2,600	e2,050	e2,450	3,320	12,200	7,780	9,040	4,030	1,740
7	6,780	3,840	3,500	2,560	e1,970	e2,480	3,300	12,300	7,620	8,530	3,810	1,710
8	5,960	3,710	e3,860	2,580	e1,880	e2,570	3,210	12,000	7,660	8,330	3,780	1,650
9	5,780	3,560	e3,690	2,660	e1,830	e2,670	3,170	14,500	8,080	8,680	3,680	1,620
10	7,010	3,490	e3,740	2,740	e1,920	e2,600	3,120	20,300	8,480	10,100	3,540	1,570
11	7,940	3,630	e4,030	e2,390	e1,880	e2,400	3,090	24,900	9,620	12,500	3,380	1,520
12	8,160	3,830	e4,160	e2,250	e1,830	e2,620	3,120	24,200	11,100	14,300	3,300	1,470
13	7,890	3,860	3,930	e2,020	e1,870	e3,770	3,050	24,800	12,800	15,200	3,310	1,550
14	7,540	3,810	3,560	e1,770	e1,870	e5,090	3,030	25,700	13,300	15,700	3,190	1,950
15	7,120	3,740	3,470	e2,000	e1,830	e5,410	3,030	26,700	13,200	16,200	3,050	2,210
16	6,690	3,620	3,390	e2,050	e1,780	e5,020	3,150	27,600	12,900	16,700	2,990	2,700
17	6,390	3,540	3,330	e1,950	e1,810	e5,350	3,510	27,800	11,800	15,900	2,910	2,240
18	6,020	3,560	3,500	e1,920	e1,860	5,630	3,900	28,200	10,900	14,100	2,820	1,860
19	5,620	3,530	3,520	e1,830	e1,830	6,040	4,090	28,400	10,100	12,400	2,730	1,720
20	5,230	3,530	3,480	e1,790	e1,800	6,140	4,220	27,500	9,480	11,400	2,610	1,630
21	4,970	3,490	3,500	e1,820	e1,730	5,380	4,460	25,200	9,020	10,800	2,510	1,630
22	4,740	3,520	3,450	e1,810	e2,260	4,910	4,900	22,700	8,360	10,700	2,450	1,600
23	4,580	3,530	3,280	e1,700	e2,960	4,650	5,240	20,400	7,950	10,300	2,350	1,590
24	4,520	3,510	e2,960	e1,730	e3,380	4,260	5,370	18,700	7,610	8,910	2,300	1,580
25	4,550	3,460	e2,550	e1,760	e3,480	3,850	5,650	17,400	6,820	7,830	2,280	1,530
26	4,650	3,460	e2,170	e1,720	e2,770	3,510	6,010	16,200	7,510	7,170	2,190	1,500
27	4,720	3,390	e2,250	e1,670	e2,410	3,310	6,170	15,100	8,440	6,800	2,160	1,480
28	4,780	3,280	e2,400	e1,600	e2,380	3,150	6,040	13,800	8,490	6,610	2,160	1,440
29	4,770	3,200	e2,480	e1,680	---	3,040	5,810	12,800	8,710	6,460	2,180	1,440
30	4,610	3,050	e2,570	e1,640	---	2,970	5,810	11,900	10,100	6,210	2,090	1,430
31	4,680	---	2,460	e1,700	---	2,900	---	11,100	---	5,830	2,040	---
TOTAL	188,300	110,950	100,240	66,360	58,880	114,500	120,930	572,210	282,090	330,170	97,830	51,900
MEAN	6,074	3,698	3,234	2,141	2,103	3,694	4,031	18,460	9,403	10,650	3,156	1,730
MAX	11,400	4,620	4,160	3,070	3,480	6,140	6,170	28,400	13,300	16,700	5,340	2,700
MIN	3,210	3,050	2,170	1,600	1,730	2,280	2,730	8,450	6,820	5,830	2,040	1,430
AC-FT	373,500	220,100	198,800	131,600	116,800	227,100	239,900	1,135,000	559,500	654,900	194,000	102,900
CFSM	0.49	0.30	0.26	0.17	0.17	0.30	0.32	1.48	0.75	0.85	0.25	0.14
IN.	0.56	0.33	0.30	0.20	0.18	0.34	0.36	1.70	0.84	0.98	0.29	0.15

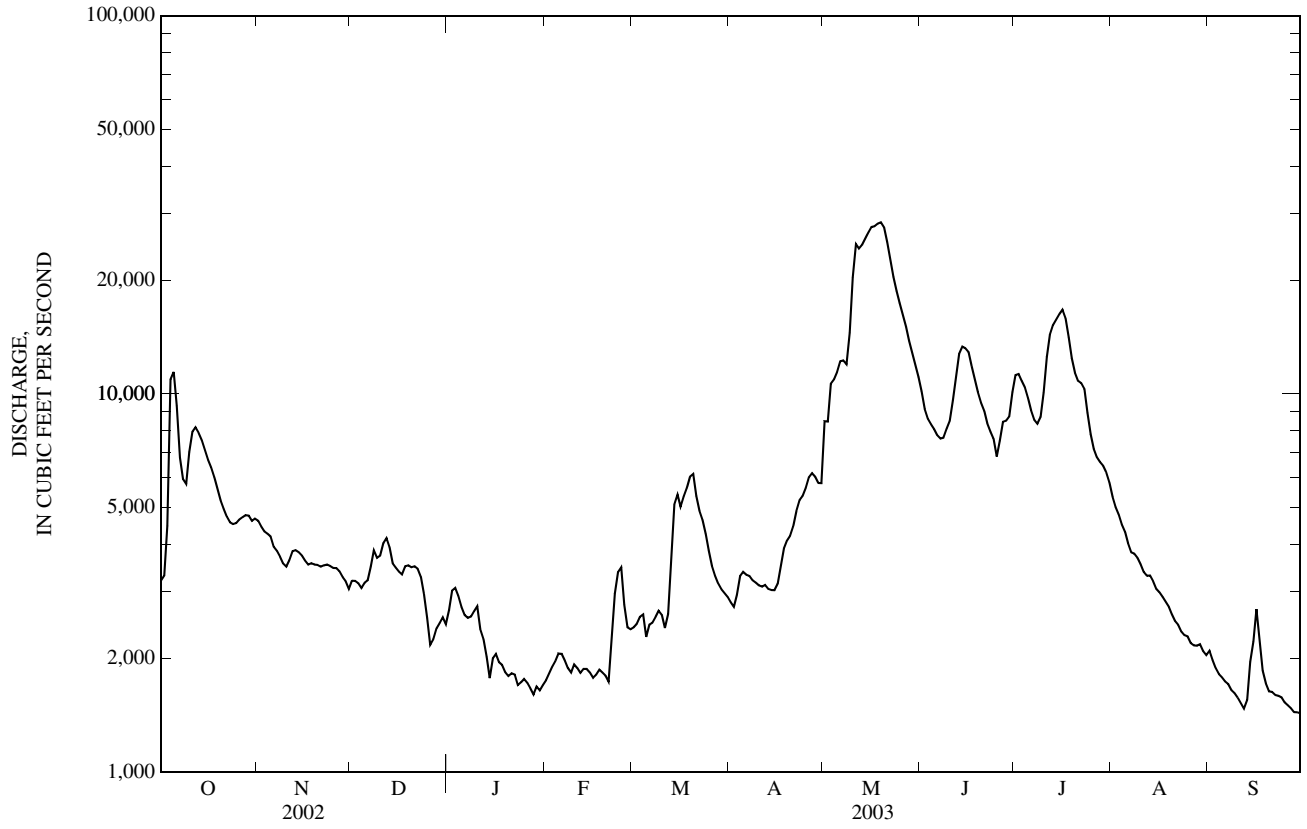
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	5,425	5,968	5,177	4,350	6,116	13,240	16,100	14,020	14,030	12,330	7,815	5,890
MAX	17,200	16,080	18,150	20,420	17,080	26,130	45,840	33,030	36,630	77,320	61,750	37,270
(WY)	(1987)	(1993)	(1983)	(1973)	(1984)	(1982)	(1993)	(1993)	(1993)	(1993)	(1993)	(1993)
MIN	926	882	664	533	661	2,273	2,536	1,709	1,022	1,019	873	982
(WY)	(1990)	(1990)	(1990)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1989)	(1989)	(1988)

05465500 IOWA RIVER AT WAPELLO, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003a	
ANNUAL TOTAL	2,117,020		2,094,360			
ANNUAL MEAN	5,800		5,738		9,215	
HIGHEST ANNUAL MEAN					30,550	1993
LOWEST ANNUAL MEAN					1,908	1989
HIGHEST DAILY MEAN	27,500	Jun 7	28,400	May 19	106,000	Jul 8, 1993
LOWEST DAILY MEAN	1,950	Feb 7	1,430	Sep 30	460	Jan 21, 1977
ANNUAL SEVEN-DAY MINIMUM	2,140	Feb 4	1,490	Sep 24	470	Jan 20, 1977
MAXIMUM PEAK FLOW			28,500	May 19	111,000	Jul 8, 1993
MAXIMUM PEAK STAGE			19.69	May 19	29.53	Jul 7, 1993
ANNUAL RUNOFF (AC-FT)	4,199,000		4,154,000		6,676,000	
ANNUAL RUNOFF (CFSM)	0.46		0.46		0.74	
ANNUAL RUNOFF (INCHES)	6.30		6.23		10.02	
10 PERCENT EXCEEDS	9,900		12,100		21,100	
50 PERCENT EXCEEDS	4,640		3,530		5,870	
90 PERCENT EXCEEDS	2,630		1,810		1,760	

a Post regulation.
e Estimated.



05465500 IOWA RIVER AT WAPELLO, IA—Continued

WATER-QUALITY RECORDS

LOCATION -- Samples collected at bridge on State Highway 99, 1200 ft. upstream of gage.

PERIOD OF RECORD.--January 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1978 to current year.
WATER TEMPERATURE: January 1978 to current year.
SUSPENDED-SEDIMENT DISCHARGE: April 1978 to current year.

REMARKS.--During periods of ice effect samples are collected in open water channel or through ice cover. Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 920 microsiemens Dec. 17, 1988; minimum daily, 168 microsiemens June 21, 1990.
WATER TEMPERATURES: Maximum daily, 33.0°C July 25, 1987; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,970 mg/L June 25, 1981; minimum daily mean, 1 mg/L Jan. 21, 22, 1981.
SEDIMENT LOADS: Maximum daily 604,000 tons June 20, 1990; minimum daily, 4.7 tons Dec. 23, 24, 1989.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 783 microsiemens Feb. 5; minimum daily, 474 microsiemens Aug. 7.
WATER TEMPERATURES: Maximum daily, 26.1°C, Aug. 7; minimum daily, 0.0°C Dec. 4.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 490 mg/L May 20; minimum daily mean, 5 mg/L Feb. 4-6.
SEDIMENT LOADS: Maximum daily, 36,500 tons May 20; minimum daily, 27 tons Feb. 4.

EXTREMES FOR CURRENT YEAR.--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Gage height, feet (00065)	Instantaneous discharge, cfs (00061)	Turbidity, water, unfltrd field, NTU (61028)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)
OCT													
03...	0904	11.66	4,040	94	747	7.6	84	8.0	510	16.0	19.8	153	183
NOV													
06...	0940	11.96	3,970	14	745	13.4	104	7.9	655	--	4.9	218	262
DEC													
04...	1040	11.43	3,060	--	760	17.0	117	8.2	642	-7.0	0.0	178	213
JAN													
08...	0955	11.11	2,560	--	740	14.3	105	8.0	670	--	1.4	227	272
FEB													
05...	1045	11.46	2,060	4.1	751	14.4	100	8.0	745	-8.4	0.1	230	281
APR													
09...	0930	11.67	3,190	--	756	17.3	131	8.7	547	--	3.4	186	185
MAY													
06...	0850	15.55	12,200	--	742	9.7	96	8.0	515	16.0	13.5	156	190
JUN													
05...	0900	14.12	8,080	--	747	10.7	115	8.6	518	--	17.7	155	182
JUL													
01...	0838	15.12	11,200	42	752	7.4	93	8.3	578	--	25.6	186	210
AUG													
07...	0930	12.00	3,810	14	747	9.9	115	8.8	409	--	21.6	107	109

05465500 IOWA RIVER AT WAPELLO, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	2,6-Diethylaniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Acetochlor, water, fltrd, ug/L (49260)	Alachlor, water, fltrd, ug/L (46342)
OCT													
03...	2	36.6	39.6	1.6	<0.04	1.93	0.022	0.04	0.39	<0.006	E.077	<0.006	<0.004
NOV													
06...	2	30.9	39.1	0.56	<0.04	6.48	0.010	0.14	0.22	--	--	--	--
DEC													
04...	2	36.5	45.6	0.95	0.15	5.21	0.013	0.10	0.20	<0.006	E.050	<0.006	<0.004
JAN													
08...	2	41.9	47.9	0.65	0.10	4.74	0.012	0.14	0.21	<0.006	E.037	0.044	0.010
FEB													
05...	--	64.9	51.9	0.63	0.08	4.54	0.019	0.21	0.30	<0.006	E.054	0.167	0.030
APR													
09...	20	38.7	39.7	1.8	<0.04	2.95	0.019	0.03	0.29	<0.006	E.095	0.191	<0.004
MAY													
06...	--	25.8	29.1	1.9	0.06	6.64	0.038	0.08	0.49	<0.006	E.090	2.89	0.044
JUN													
05...	4	28.2	34.0	1.9	<0.04	7.01	0.026	--	0.27	<0.006	E.083	0.066	E.003
JUL													
01...	8	25.7	29.1	1.6	<0.04	8.94	0.088	0.02	0.37	<0.006	E.155	1.61	<0.004
AUG													
07...	11	32.7	37.9	2.3	<0.04	2.42	0.033	<0.02	0.25	<0.006	E.052	0.008	<0.004

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	alpha-HCH, water, fltrd, ug/L (34253)	Atrazine, water, fltrd, ug/L (39632)	Azinphosmethyl, water, fltrd 0.7u GF ug/L (82686)	Benfluralin, water, fltrd 0.7u GF ug/L (82673)	Butylate, water, fltrd, ug/L (04028)	Carbaryl, water, fltrd 0.7u GF ug/L (82680)	Carbofuran, water, fltrd 0.7u GF ug/L (82674)	Chlorpyrifos water, fltrd, ug/L (38933)	cis-Permethrin water fltrd 0.7u GF ug/L (82687)	Cyanazine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Diazinon, water, fltrd, ug/L (39572)	Dieldrin, water, fltrd, ug/L (39381)
OCT													
03...	<0.005	0.100	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
NOV													
06...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
04...	<0.005	0.063	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
JAN													
08...	<0.005	0.303	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
FEB													
05...	<0.005	0.912	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
APR													
09...	<0.005	3.93	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
MAY													
06...	<0.005	7.70	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
JUN													
05...	<0.005	0.471	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
JUL													
01...	<0.005	2.63	<0.050	<0.010	<0.002	<0.041	E.010	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005
AUG													
07...	<0.005	0.175	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	<0.005

05465500 IOWA RIVER AT WAPELLO, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Disulfoton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethalfluralin, water, fltrd 0.7u GF ug/L (82663)	Ethoprop, water, fltrd 0.7u GF ug/L (82672)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Malathion, water, fltrd, ug/L (39532)	Methyl parathion, water, fltrd 0.7u GF ug/L (82667)	Metolachlor, water, fltrd, ug/L (39415)	Metribuzin, water, fltrd, ug/L (82630)	Molinate, water, fltrd 0.7u GF ug/L (82671)	Napropamide, water, fltrd 0.7u GF ug/L (82684)
OCT													
03...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.036	<0.006	<0.002	<0.007
NOV													
06...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
04...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.020	<0.006	<0.002	<0.007
JAN													
08...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.036	<0.006	<0.002	<0.007
FEB													
05...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.025	<0.006	<0.002	<0.007
APR													
09...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.122	<0.006	<0.002	<0.007
MAY													
06...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	2.59	<0.006	<0.002	<0.007
JUN													
05...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.105	<0.006	<0.002	<0.007
JUL													
01...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.277	<0.006	<0.002	<0.007
AUG													
07...	<0.02	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.046	<0.006	<0.002	<0.007

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	p,p'-DDE, water, fltrd, ug/L (34653)	Parathion, water, fltrd, ug/L (39542)	Pebulate, water, fltrd 0.7u GF ug/L (82669)	Pendimethalin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prometon, water, fltrd, ug/L (04037)	Pronamide, water, fltrd 0.7u GF ug/L (82676)	Propachlor, water, fltrd, ug/L (04024)	Propanil, water, fltrd 0.7u GF ug/L (82679)	Propargite, water, fltrd 0.7u GF ug/L (82685)	Tebuthiuron water fltrd 0.7u GF ug/L (82670)	Terbacil, water, fltrd 0.7u GF ug/L (82665)	Terbufos, water, fltrd 0.7u GF ug/L (82675)
OCT													
03...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
NOV													
06...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
04...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
JAN													
08...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
FEB													
05...	<0.003	<0.010	<0.004	<0.022	<0.011	0.02	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
APR													
09...	<0.003	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
MAY													
06...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
JUN													
05...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
JUL													
01...	<0.003	<0.010	<0.004	<0.022	<0.011	0.05	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02
AUG													
07...	<0.003	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.02	<0.034	<0.02

05465500 IOWA RIVER AT WAPELLO, IA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Thiobencarb water fltrd 0.7u GF ug/L (82681)	Triallate, water, fltrd 0.7u GF ug/L (82678)	Trifluralin, water, fltrd 0.7u GF ug/L (82661)	Suspended sediment concentration mg/L (80154)
OCT				
03...	<0.005	<0.002	<0.009	147
NOV				
06...	--	--	--	59
DEC				
04...	<0.005	<0.002	<0.009	18
JAN				
08...	<0.005	<0.002	<0.009	13
FEB				
05...	<0.005	<0.002	<0.009	5
APR				
09...	<0.005	<0.002	<0.009	29
MAY				
06...	<0.005	<0.002	<0.009	326
JUN				
05...	<0.005	<0.002	<0.009	106
JUL				
01...	<0.005	<0.002	<0.009	299
AUG				
07...	<0.005	<0.002	<0.009	57

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Temperature, water, deg C (00010)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT						
03...	0945	4,040	19.8	95	170	1,850
NOV						
06...	1025	3,970	4.9	96	17	182
APR						
09...	0950	3,190	3.4	96	35	301
MAY						
06...	1000	12,200	13.5	81	338	11,100
14...	1215	25,800	16.1	81	342	23,800
JUN						
05...	1000	8,080	17.7	97	108	2,360
JUL						
01...	0900	11,200	25.6	60	352	10,600
AUG						
07...	1005	3,810	21.6	95	71	730

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Bed sediment, dry svd sve dia percent <.063mm (80164)	Bed sediment, dry svd sve dia percent <.125mm (80165)	Bed sediment, dry svd sve dia percent <.25mm (80166)	Bed sediment, dry svd sve dia percent <.5 mm (80167)	Bed sediment, dry svd sve dia percent <1 mm (80168)	Bed sediment, dry svd sve dia percent <2 mm (80169)	Bed sediment, dry svd sve dia percent <4 mm (80170)	Bed sediment, dry svd sve dia percent <8 mm (80171)	Bed sediment, dry svd sve dia percent <16 mm (80172)	Number of sampling points, count (00063)
OCT											
03...	0945	1	2	7	40	79	94	99	100	--	5
NOV											
06...	1025	0.0	1	7	35	75	93	98	100	--	5
APR											
09...	0950	1	2	12	45	87	98	100	--	--	5
MAY											
06...	0945	--	0.0	13	59	87	97	99	100	--	5
JUN											
05...	1000	--	0.0	5	34	75	93	97	98	100	5
JUL											
01...	0900	--	0.0	3	17	54	83	94	98	100	3
AUG											
07...	1005	--	0.0	4	53	87	96	99	100	--	5

05465500 IOWA RIVER AT WAPELLO, IA—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	594	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	533	---	---	---	---	---	---	---	---	---	---	---
4	---	---	680	---	---	---	---	---	---	---	---	---
5	---	---	---	---	783	---	---	---	547	---	---	---
6	---	592	---	---	---	---	---	522	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	474	---
8	---	---	---	686	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	566	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	497	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	25.6	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	19.8	---	---	---	---	---	---	---	---	---	---	---
4	---	---	0.0	---	---	---	---	---	---	---	---	---
5	---	---	---	---	0.1	---	---	---	17.7	---	---	---
6	---	4.9	---	---	---	---	---	13.5	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	26.1	---
8	---	---	---	1.4	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	3.4	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	16.0	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---

05465500 IOWA RIVER AT WAPELLO, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

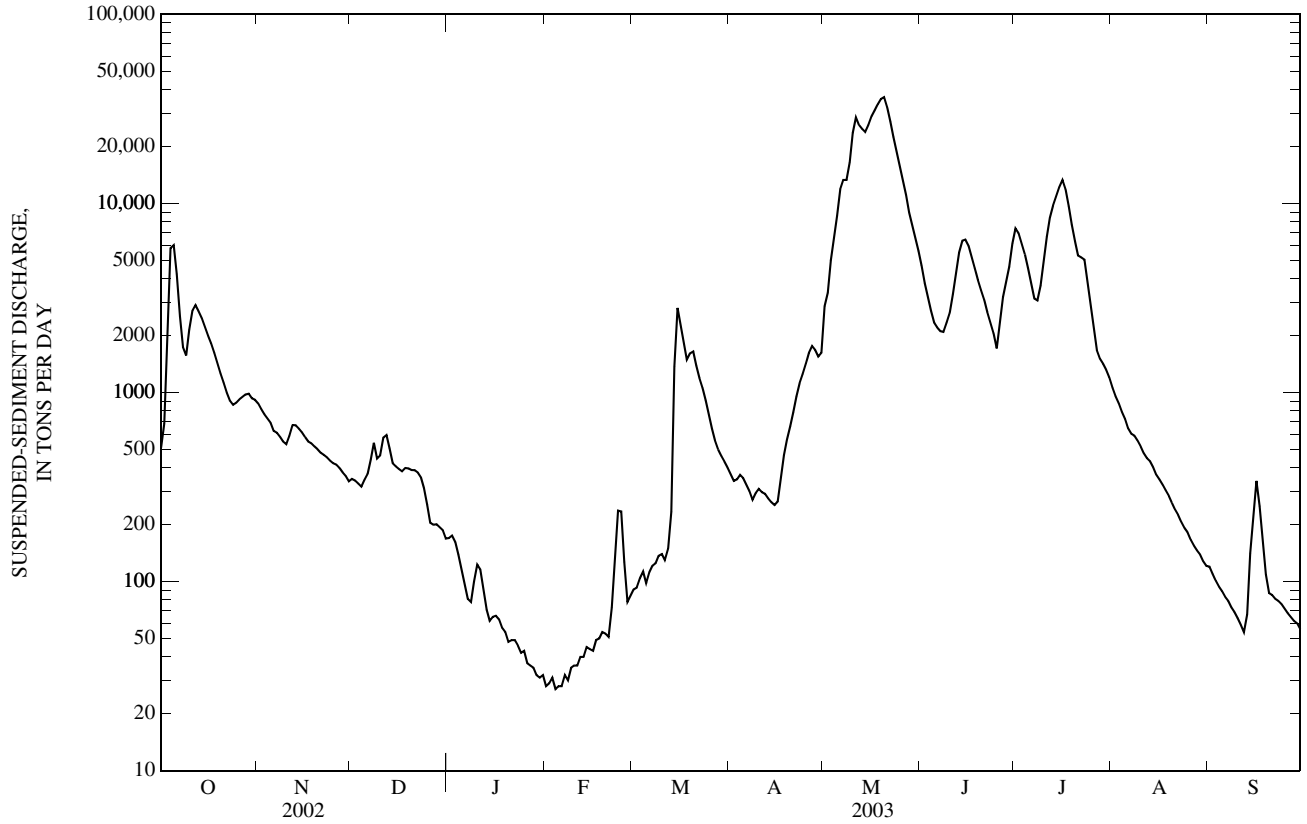
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	59	510	70	875	40	349	23	170	6	28	14	91
2	76	684	68	817	40	342	21	175	6	29	14	93
3	155	1,910	66	767	39	330	20	162	6	31	15	104
4	195	5,800	63	729	38	318	18	139	5	27	16	113
5	195	6,020	61	691	40	346	16	116	5	28	16	98
6	168	4,230	59	627	43	371	14	96	5	28	17	112
7	138	2,530	59	613	47	443	12	81	6	32	18	121
8	108	1,740	58	582	52	542	11	78	6	30	18	125
9	101	1,570	57	550	45	448	14	100	7	35	19	137
10	114	2,150	56	532	46	465	17	123	7	36	20	140
11	126	2,710	60	589	53	577	18	116	7	36	20	130
12	132	2,900	65	673	53	595	15	91	8	40	21	149
13	127	2,690	64	671	48	507	13	71	8	40	23	234
14	121	2,470	63	645	44	422	13	62	9	45	100	1,370
15	116	2,230	61	616	43	407	12	65	9	44	192	2,800
16	111	2,000	59	581	43	394	12	66	9	43	166	2,250
17	105	1,820	58	550	43	383	12	63	10	49	125	1,810
18	100	1,620	56	539	42	399	11	57	10	50	98	1,490
19	95	1,430	54	518	42	397	11	54	11	54	99	1,610
20	89	1,260	53	501	41	389	10	48	11	53	99	1,650
21	84	1,130	51	480	41	388	10	49	11	51	95	1,390
22	79	1,000	49	468	41	378	10	49	12	73	90	1,190
23	73	905	48	454	40	356	10	46	16	128	84	1,060
24	71	862	46	436	39	312	9	42	26	237	79	909
25	72	883	45	422	37	255	9	43	25	235	73	765
26	73	918	44	415	35	205	8	37	17	127	68	644
27	74	948	44	399	33	200	8	36	12	78	62	558
28	76	976	43	378	31	201	8	35	13	84	59	499
29	77	985	42	362	29	194	7	32	---	---	56	461
30	75	931	41	339	27	187	7	31	---	---	54	431
31	72	915	---	---	25	169	7	32	---	---	51	401
TOTAL	---	58,727	---	16,819	---	11,269	---	2,365	---	1,771	---	22,935

05465500 IOWA RIVER AT WAPELLO, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	49	370	125	2,860	171	4,690	244	7,370	73	1,060	21	120
2	46	341	147	3,370	154	3,790	228	6,950	71	956	20	110
3	44	347	174	5,000	137	3,180	210	6,140	68	877	20	101
4	41	367	224	6,590	121	2,710	192	5,380	65	793	19	94
5	39	353	279	8,580	108	2,340	173	4,570	62	726	18	89
6	36	325	362	11,900	105	2,210	155	3,770	59	647	18	83
7	34	300	401	13,300	103	2,110	136	3,140	59	605	17	79
8	31	271	410	13,300	101	2,090	137	3,070	58	591	16	73
9	34	294	420	16,500	108	2,340	157	3,680	56	557	16	69
10	37	309	430	23,600	115	2,630	177	4,820	54	518	15	64
11	36	297	426	28,600	128	3,310	197	6,670	52	477	14	59
12	34	291	398	26,000	144	4,330	217	8,410	50	449	14	54
13	33	275	370	24,800	160	5,520	238	9,750	48	433	16	67
14	32	263	345	23,900	177	6,350	258	10,900	46	402	26	141
15	31	254	360	26,000	181	6,430	278	12,200	44	368	37	226
16	31	265	387	28,800	172	5,970	294	13,300	42	347	46	341
17	37	354	413	31,000	163	5,200	278	11,900	41	325	41	250
18	44	466	439	33,500	154	4,540	254	9,660	40	304	32	162
19	51	565	466	35,700	145	3,950	230	7,710	38	284	23	109
20	58	662	490	36,500	136	3,480	206	6,310	37	261	20	87
21	65	784	474	32,300	127	3,090	182	5,310	35	240	19	85
22	72	953	441	27,100	118	2,660	180	5,180	34	225	19	81
23	79	1,120	407	22,500	109	2,340	181	5,040	32	206	18	79
24	86	1,250	374	18,900	100	2,060	159	3,830	31	192	18	76
25	93	1,420	340	16,000	92	1,710	136	2,870	29	182	17	72
26	100	1,620	307	13,400	112	2,280	113	2,180	28	166	17	68
27	106	1,760	273	11,100	140	3,200	91	1,670	26	155	17	65
28	103	1,680	241	8,980	168	3,860	85	1,510	25	146	16	62
29	99	1,550	221	7,620	197	4,630	82	1,420	23	139	16	60
30	103	1,620	204	6,570	225	6,150	79	1,320	22	128	15	56
31	---	---	187	5,600	---	---	76	1,200	22	121	---	---
TOTAL	---	20,726	---	569,870	---	109,150	---	177,230	---	12,880	---	3,082
YEAR	1,006,824											

05465500 IOWA RIVER AT WAPELLO, IA—Continued



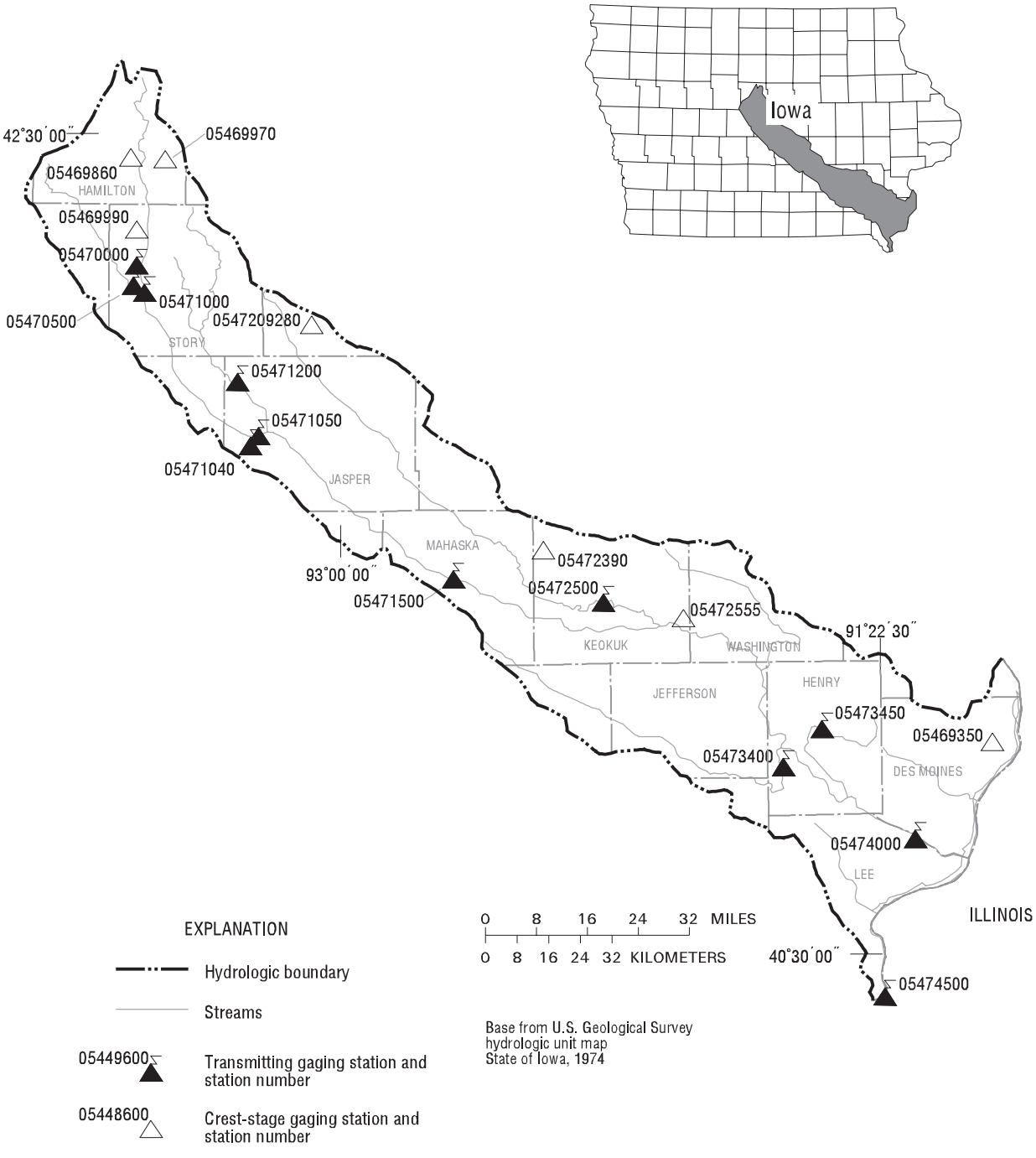


Figure 11. Locations of active continuous-record and crest-stage gaging stations in the Skunk River drainage basins.

Gaging Stations

05470000 South Skunk River near Ames, IA 216
05470500 Squaw Creek at Ames, IA 218
05471000 South Skunk River below Squaw Creek near Ames, IA 220
05471040 Squaw Creek near Colfax, IA. 222
05471050 South Skunk River at Colfax, IA 232
05471200 Indian Creek near Mingo, IA 234
05471500 South Skunk River near Oskaloosa, IA 236
05472500 North Skunk River near Sigourney, IA 238
05473400 Cedar Creek near Oakland Mills, IA 240
05473450 Big Creek near Mt. Pleasant. 242
05474000 Skunk River at Augusta, IA 244
05474500 Mississippi River at Keokuk, IA 252

Crest Stage Gaging Stations

05469350 Haight Creek at Kingston, IA. 460
05469860 Mud Lake Drainage Ditch 71 at Jewell, IA 460
05469970 Long Dick Creek near Ellsworth, IA 460
05469990 Keigley Branch near Story City, IA 460
0547209280 Snipe Creek Tributary at Melbourne, IA 460
05472390 Middle Creek near Lacey, IA 460
05472555 Skunk River Tributary near Richland, IA 460

05470000 SOUTH SKUNK RIVER NEAR AMES, IA

LOCATION.--Lat 42°04'06", long 93°37'09", in NW¼ SW¼ sec.23, T.84 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 2.5 mi north of Ames, 3.5 mi downstream from Keigley Branch, 5.2 mi upstream from Squaw Creek, and at mile 228.1 upstream from mouth of Skunk River.

DRAINAGE AREA.--315 mi^2.

PERIOD OF RECORD.--July 1920 to September 1927, October 1932 to September 1995, October 1, 1996 to current year. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1966, published as "Skunk River near Ames".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1921, 1925-26, 1934-35 (M), 1937 (M), 1939 (M), 1947-50 (M). WDR IA-67-1: 1965. WDR IA-74-1: 1973 (P).

GAGE.--Water-stage recorder. Concrete control since July 21, 1934. Datum of gage is 893.61 ft above NGVD of 1929 (Iowa Highway Commission benchmark). Prior to Aug. 25, 1921, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with phone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 17, 1996 reached about 14,000 ft^3/s, from rating curve extension, gage height 15.89 ft, from highwater mark.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	102	e33	11	19	e23	59	795	163	228	52	3.9
2	49	94	52	12	e19	e16	61	591	162	199	45	3.7
3	92	91	e40	e8.1	e15	e22	61	459	170	173	40	3.5
4	156	86	47	12	e12	e21	64	468	162	150	38	2.9
5	372	83	43	12	e11	e16	65	1,140	157	287	38	2.5
6	302	81	43	12	e11	e24	59	1,340	166	e300	39	e2.7
7	208	75	44	12	e6.3	27	61	978	268	326	34	e2.8
8	160	74	44	14	e12	25	65	808	281	282	30	e2.9
9	136	e72	40	e14	e9.0	e21	67	1,090	146	1,240	26	e2.9
10	120	e72	41	e12	e11	e29	77	1,110	263	1,930	25	e3.1
11	108	71	e36	e11	e14	e37	125	795	297	1,730	23	e3.5
12	99	66	e31	e13	e9.5	30	160	649	268	998	20	e5.2
13	91	63	e30	e16	e14	31	144	548	242	694	18	e6.1
14	81	67	e35	e14	e21	36	126	716	212	519	16	e4.8
15	79	69	44	e12	e12	e41	118	712	193	413	12	e4.2
16	77	65	e38	e14	e9.0	e48	126	579	174	329	10	e3.6
17	73	63	e40	e13	e15	e63	127	490	158	262	10	e4.2
18	72	64	46	e12	e22	e84	127	426	155	222	11	e4.6
19	69	62	49	e13	e16	78	e150	386	138	192	10	e5.5
20	63	60	47	e18	25	68	e180	343	123	169	9.6	e4.9
21	61	59	37	e15	e21	54	e584	309	114	154	10	e4.3
22	61	57	33	e13	e17	49	e475	293	108	139	8.3	e5.8
23	58	56	e23	e9.3	e14	48	389	278	102	121	7.1	e4.3
24	60	56	e18	e15	e10	47	e344	262	97	109	6.2	e4.8
25	66	50	14	e12	e8.4	40	e335	247	225	100	5.6	e2.5
26	70	37	12	e8.1	e13	36	e326	228	643	91	7.7	e2.7
27	74	e32	12	e10	e17	36	e292	218	506	84	11	e2.8
28	76	52	12	e17	e21	41	e267	207	388	79	6.4	e2.7
29	83	61	14	e9.3	---	54	e244	199	347	70	5.2	e2.6
30	111	38	15	e16	---	64	464	192	273	64	4.8	e2.1
31	108	---	14	20	---	59	---	178	---	58	4.6	---
TOTAL	3,270	1,978	1,027	399.8	404.2	1,268	5,742	17,034	6,701	11,712	583.5	112.1
MEAN	105	65.9	33.1	12.9	14.4	40.9	191	549	223	378	18.8	3.74
MAX	372	102	52	20	25	84	584	1,340	643	1,930	52	6.1
MIN	35	32	12	8.1	6.3	16	59	178	97	58	4.6	2.1
AC-FT	6,490	3,920	2,040	793	802	2,520	11,390	33,790	13,290	23,230	1,160	222
CFSM	0.33	0.21	0.11	0.04	0.05	0.13	0.61	1.74	0.71	1.20	0.06	0.01
IN.	0.39	0.23	0.12	0.05	0.05	0.15	0.68	2.01	0.79	1.38	0.07	0.01

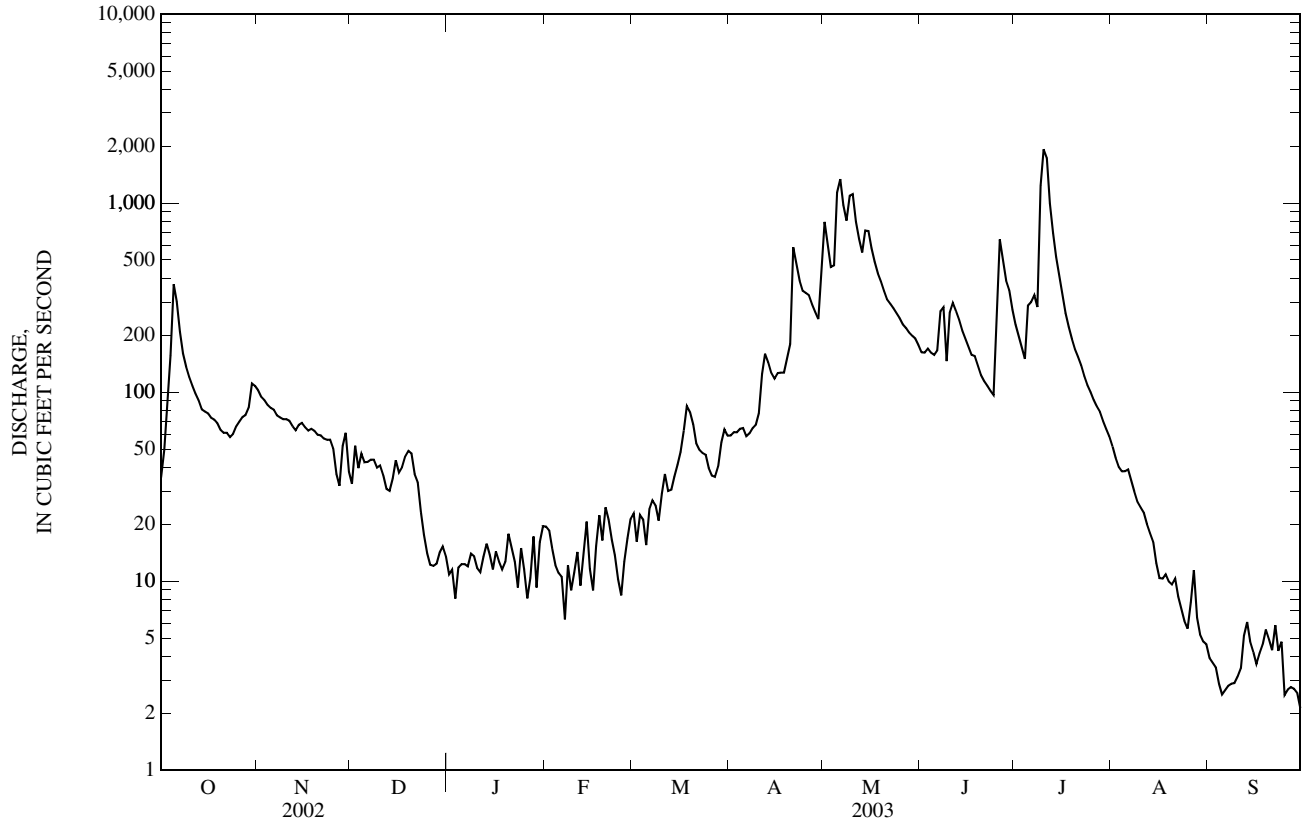
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2003, BY WATER YEAR (WY)

MEAN	93.1	96.6	69.2	48.6	116	308	279	285	384	223	111	92.4
MAX	723	726	537	315	623	1,034	1,208	1,193	1,900	2,628	1,782	577
(WY)	(1987)	(1973)	(1983)	(1973)	(1984)	(1979)	(1965)	(1944)	(1947)	(1993)	(1993)	(1926)
MIN	0.12	0.14	0.000	0.000	0.31	6.35	5.44	2.28	0.011	0.017	0.087	0.081
(WY)	(1954)	(1956)	(1977)	(1977)	(1956)	(1981)	(2000)	(1934)	(1977)	(1977)	(1934)	(1976)

05470000 SOUTH SKUNK RIVER NEAR AMES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1921 - 2003	
ANNUAL TOTAL	40,930.1		50,231.6			
ANNUAL MEAN	112		138		176	
HIGHEST ANNUAL MEAN					752	1993
LOWEST ANNUAL MEAN					5.58	1956
HIGHEST DAILY MEAN	1,940	May 12	1,930	Jul 10	8,980	Jul 9, 1993
LOWEST DAILY MEAN	9.1	Sep 18	2.1	Sep 30	0.00	Jun 20, 1934
ANNUAL SEVEN-DAY MINIMUM	9.7	Sep 12	2.8	Sep 4	0.00	Jun 20, 1934a
MAXIMUM PEAK FLOW			2,030	Jul 10	11,200	Aug 16, 1993
MAXIMUM PEAK STAGE			5.92	Jul 10	14.23	Aug 16, 1993
INSTANTANEOUS LOW FLOW			2.1	Sep 30	0.00	Jun 20, 1934
ANNUAL RUNOFF (AC-FT)	81,180		99,630		127,200	
ANNUAL RUNOFF (CFSM)	0.36		0.44		0.56	
ANNUAL RUNOFF (INCHES)	4.83		5.93		7.57	
10 PERCENT EXCEEDS	240		343		430	
50 PERCENT EXCEEDS	64		54		57	
90 PERCENT EXCEEDS	24		6.4		2.5	

a Many days in 1934, 1953-56, 1976-77.
e Estimated.



05470500 SQUAW CREEK AT AMES, IA

LOCATION.--Lat 42°01'21", long 93°37'45", in NE¼ NW¼ sec.10, T.83 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 65 ft downstream from Lincoln Way Bridge in Ames, 0.2 mi downstream from College Creek, and 2.4 mi upstream from mouth.

DRAINAGE AREA.--204 mi^2.

PERIOD OF RECORD.--May 1919 to September 1927, May 1965 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: Drainage area, 1920-22 (M), 1923, 1924-25 (M), 1926, 1927 (M), WDR IA-66-1: 1965, WDR IA-71-1: 1970 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 881.00 ft. above NGVD of 1929 (levels by Iowa State University). Prior to Mar. 11, 1925, nonrecording gage at site 0.6 mi upstream at different datum. Mar. 11, 1925 to Apr. 30, 1927, nonrecording gage at site 65 ft. upstream at datum about 4 ft. higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with phone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 4, 1918 reached a stage of 14.5 ft. from floodmarks, site and datum used 1919-25, discharge, 6,900 ft^3/s. Flood of Mar. 1, 1965 reached a stage of 10.7 ft. from graph based on gage readings, at present site and datum, discharge, 4,200 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	40	e10	e7.9	e4.6	e9.0	28	596	111	387	44	1.4
2	34	37	e14	e7.3	e5.5	e5.3	27	406	123	371	38	1.8
3	13	36	e11	e6.5	e4.9	e9.1	26	331	114	355	32	2.8
4	38	35	17	e9.6	e3.0	e9.9	28	465	106	345	29	2.8
5	110	35	15	e11	e2.2	e8.5	27	1,040	e105	1,010	32	2.4
6	71	33	15	e11	e1.5	e16	23	781	118	916	31	1.5
7	48	30	15	e11	e1.7	e18	31	622	120	722	26	0.98
8	38	29	e13	e12	e3.3	e15	31	532	134	692	22	0.17
9	33	29	e9.7	e11	e1.7	e13	28	973	140	2,160	20	0.00
10	30	28	e12	e7.0	e2.4	e18	42	727	140	2,080	20	0.00
11	26	27	e10	e3.8	e4.3	e24	74	529	127	1,250	19	12
12	23	25	e9.0	e4.6	e2.0	e11	72	421	117	951	16	8.9
13	21	24	e9.0	e5.0	e2.6	e12	61	377	110	666	14	5.5
14	19	25	e11	e4.4	e3.0	e16	54	614	98	460	12	4.1
15	17	25	e14	e2.9	e1.9	e23	53	525	89	325	11	1.7
16	18	24	e13	e4.7	e1.8	e32	60	411	84	253	10	0.76
17	e15	22	18	e2.9	e4.0	e38	51	351	86	217	8.9	0.00
18	18	24	21	e1.9	e5.6	e43	50	307	92	189	7.8	4.3
19	16	23	22	e2.5	e4.4	e38	83	272	91	166	6.4	1.6
20	15	22	18	e4.3	e6.6	35	219	243	89	150	12	0.00
21	15	21	12	e2.6	e5.2	26	234	222	93	138	6.0	28
22	14	20	11	e1.9	e4.0	22	175	210	98	119	4.0	8.9
23	14	20	11	e0.55	e2.9	21	148	197	103	102	3.3	1.2
24	23	20	e11	e1.9	e2.0	21	153	185	112	91	2.9	0.04
25	29	14	e10	e1.4	e1.3	19	153	173	531	80	2.1	0.03
26	25	16	e9.4	e0.49	e2.6	18	157	158	670	69	20	0.00
27	28	15	e9.6	e1.7	e5.5	24	146	148	533	118	4.7	0.00
28	31	21	e9.9	e4.1	e8.5	24	139	143	572	81	2.5	0.00
29	34	25	e10	e1.4	---	28	130	133	486	63	1.9	0.00
30	46	14	e10	e3.2	---	31	365	134	419	56	1.4	0.00
31	43	---	e9.0	e4.4	---	29	---	120	---	49	1.4	---
TOTAL	915	759	389.6	154.94	99.0	656.8	2,868	12,346	5,811	14,631	461.3	90.88
MEAN	29.5	25.3	12.6	5.00	3.54	21.2	95.6	398	194	472	14.9	3.03
MAX	110	40	22	12	8.5	43	365	1,040	670	2,160	44	28
MIN	10	14	9.0	0.49	1.3	5.3	23	120	84	49	1.4	0.00
AC-FT	1,810	1,510	773	307	196	1,300	5,690	24,490	11,530	29,020	915	180
CFSM	0.14	0.12	0.06	0.02	0.02	0.10	0.47	1.95	0.95	2.31	0.07	0.01
IN.	0.17	0.14	0.07	0.03	0.02	0.12	0.52	2.25	1.06	2.67	0.08	0.02

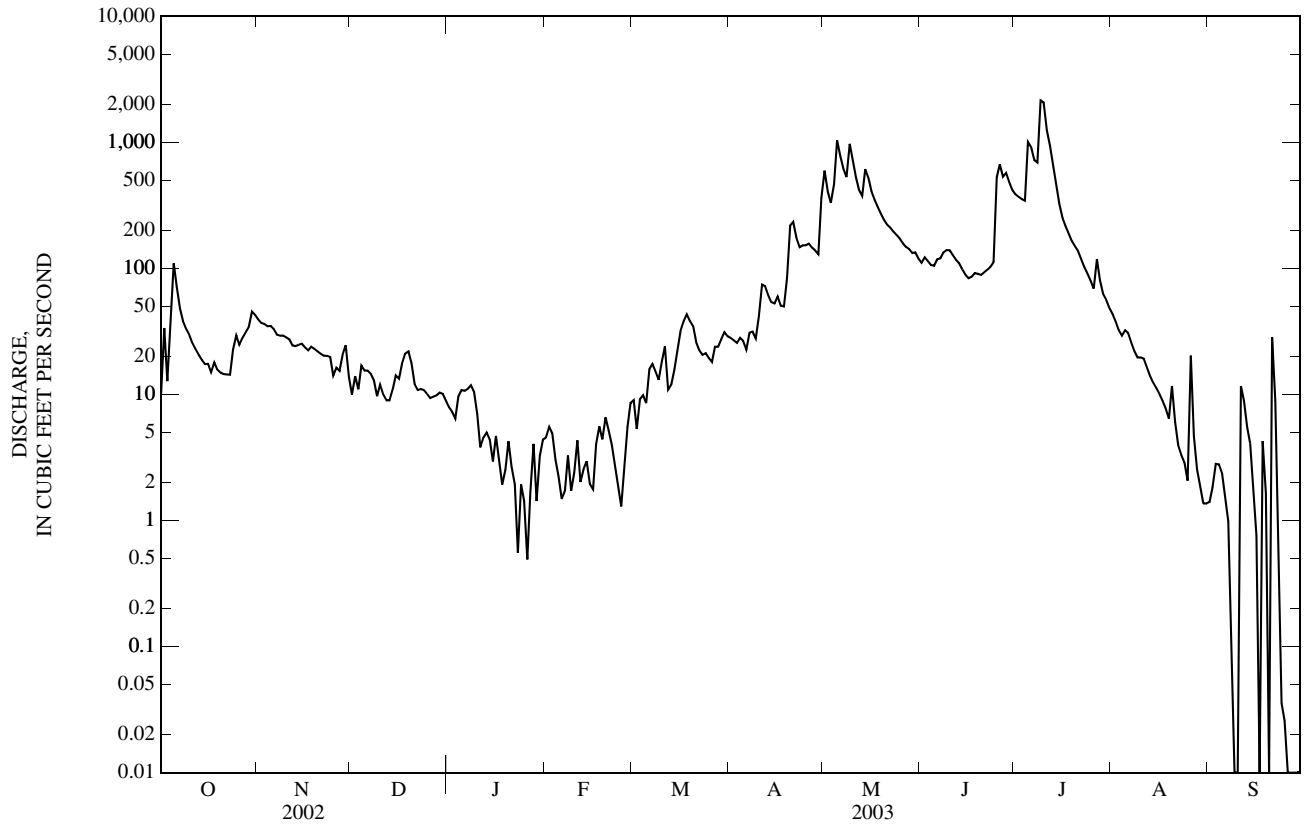
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 2003, BY WATER YEAR (WY)

MEAN	76.6	81.2	58.3	38.3	94.0	202	216	237	314	175	81.6	76.6
MAX	505	491	372	275	465	777	796	817	1,107	2,128	1,177	568
(WY)	(1974)	(1973)	(1983)	(1973)	(1973)	(1979)	(1999)	(1990)	(1975)	(1993)	(1993)	(1926)
MIN	0.30	0.63	0.001	0.000	0.093	2.51	4.32	1.42	2.97	3.61	0.95	0.071
(WY)	(2001)	(1967)	(1977)	(1977)	(1977)	(1981)	(1977)	(1981)	(1977)	(1927)	(1989)	(1971)

05470500 SQUAW CREEK AT AMES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1920 - 2003	
ANNUAL TOTAL	21,074.23		39,182.52			
ANNUAL MEAN	57.7		107		138	
HIGHEST ANNUAL MEAN					528	1993
LOWEST ANNUAL MEAN					13.6	1981
HIGHEST DAILY MEAN	830	May 12	2,160	Jul 9	12,200	Jul 9, 1993
LOWEST DAILY MEAN	0.51	Sep 26	0.00	Sep 9	0.00	Jul 31, 1925a
ANNUAL SEVEN-DAY MINIMUM	0.76	Sep 24	0.01	Sep 24	0.00	Oct 7, 1971
MAXIMUM PEAK FLOW			3,200	Jul 9	24,300	Jul 9, 1993
MAXIMUM PEAK STAGE			7.80	Jul 9	18.54	Jul 9, 1993
INSTANTANEOUS LOW FLOW			0.00	Sep 8b	0.00	Jul 31, 1925a
ANNUAL RUNOFF (AC-FT)	41,800		77,720		99,980	
ANNUAL RUNOFF (CFSM)	0.28		0.53		0.68	
ANNUAL RUNOFF (INCHES)	3.84		7.15		9.19	
10 PERCENT EXCEEDS	161		347		340	
50 PERCENT EXCEEDS	27		22		44	
90 PERCENT EXCEEDS	5.8		1.9		1.7	

a Many years.
b Also Sept. 9-11, 16-21, 24-30.
e Estimated.



05471000 SOUTH SKUNK RIVER BELOW SQUAW CREEK NEAR AMES, IA

LOCATION.--Lat 42°00'24", long 93°35'43", in NE¼ NW¼ sec.13, T.83 N., R.24 W., Story County, Hydrologic Unit 07080105, on right bank 500 ft downstream from bridge on county highway, 0.2 mi downstream from Squaw Creek, 200 ft upstream from bridge on U.S. Highway 30, 2 mi southeast of Ames, and at mile 222.6 upstream from mouth of Skunk River.

DRAINAGE AREA.--556 mi^2.

PERIOD OF RECORD.--October 1952 to December 1979, October 1991 to current year. Prior to October 1966, published as "Skunk River below Squaw Creek near Ames".

REVISED RECORDS.--WDR IA-95-1: Location.

GAGE.--Water-stage recorder. Datum of gage is 857.10 ft above NGVD of 1929. Prior to Oct. 1, 1973, at datum 10.00 ft higher. Prior to Oct. 1991, at site 500 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Low flows are affected by pumpage by City of Ames from surficial aquifer and do not represent the natural flow of the stream. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1944, reached a stage of 13 ft, from floodmarks, discharge, 10,000 ft^3/s, datum then in use.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	136	e50	e19	e22	e32	94	1,580	e305	456	84	5.7
2	e85	129	e61	e20	e21	e28	92	e1,350	303	396	72	3.9
3	e115	123	e53	e19	e19	e33	90	e1,130	300	347	63	6.4
4	166	118	e60	e21	e16	e32	93	958	284	306	56	6.3
5	370	115	e55	e22	e14	e26	94	2,530	276	979	57	3.4
6	348	116	e56	e22	e13	e36	88	2,560	306	1,030	56	2.0
7	233	108	e57	e21	e12	e38	96	1,780	389	709	49	1.5
8	189	101	e57	e22	e16	e36	e90	1,450	419	594	43	1.3
9	165	102	e55	e21	e13	e39	e89	2,370	470	3,430	39	0.91
10	149	100	e56	e18	e15	e50	113	2,190	463	4,480	36	0.76
11	131	97	e51	e15	e17	e67	173	1,470	428	3,040	35	4.8
12	117	89	e45	e17	e15	e60	211	1,130	394	1,780	31	11
13	106	85	e44	e21	e20	e58	190	e1,000	366	1,220	28	1.7
14	98	86	e50	e19	e24	e70	172	1,480	331	929	24	2.3
15	93	87	e54	e17	e16	e85	157	1,340	304	735	21	2.5
16	93	83	e51	e20	e14	e117	169	1,040	285	599	17	1.4
17	90	82	e53	e17	e21	e115	159	857	272	513	15	1.1
18	88	82	e56	e16	e26	e120	152	737	267	450	17	1.4
19	83	82	e58	e18	e23	132	205	662	248	398	16	2.9
20	79	79	e55	e21	e27	e120	e237	594	227	359	17	0.51
21	76	77	e47	e19	e25	89	e716	542	e210	329	14	33
22	76	76	e43	e17	e23	84	e557	511	204	291	14	11
23	75	75	e35	e16	e19	82	e416	486	196	255	12	5.0
24	83	e74	e28	e19	e14	81	e361	457	189	226	17	2.9
25	99	e71	e24	e16	e13	72	e357	431	623	198	13	4.1
26	90	e59	e20	e12	e20	68	349	402	1,170	170	32	5.0
27	99	e51	e20	e14	e25	73	317	379	929	242	12	4.6
28	105	e59	e20	e20	e31	77	291	362	840	167	7.9	2.0
29	105	e68	e22	e15	---	85	262	344	687	129	8.0	1.1
30	139	e52	e23	e21	---	101	573	e325	544	112	13	0.62
31	142	---	e23	e22	---	96	---	e308	---	96	13	---
TOTAL	3,925	2,662	1,382	577	534	2,202	6,963	32,755	12,229	24,965	931.9	131.10
MEAN	127	88.7	44.6	18.6	19.1	71.0	232	1,057	408	805	30.1	4.37
MAX	370	136	61	22	31	132	716	2,560	1,170	4,480	84	33
MIN	38	51	20	12	12	26	88	308	189	96	7.9	0.51
AC-FT	7,790	5,280	2,740	1,140	1,060	4,370	13,810	64,970	24,260	49,520	1,850	260
CFSM	0.23	0.16	0.08	0.03	0.03	0.13	0.42	1.90	0.73	1.45	0.05	0.01
IN.	0.26	0.18	0.09	0.04	0.04	0.15	0.47	2.19	0.82	1.67	0.06	0.01

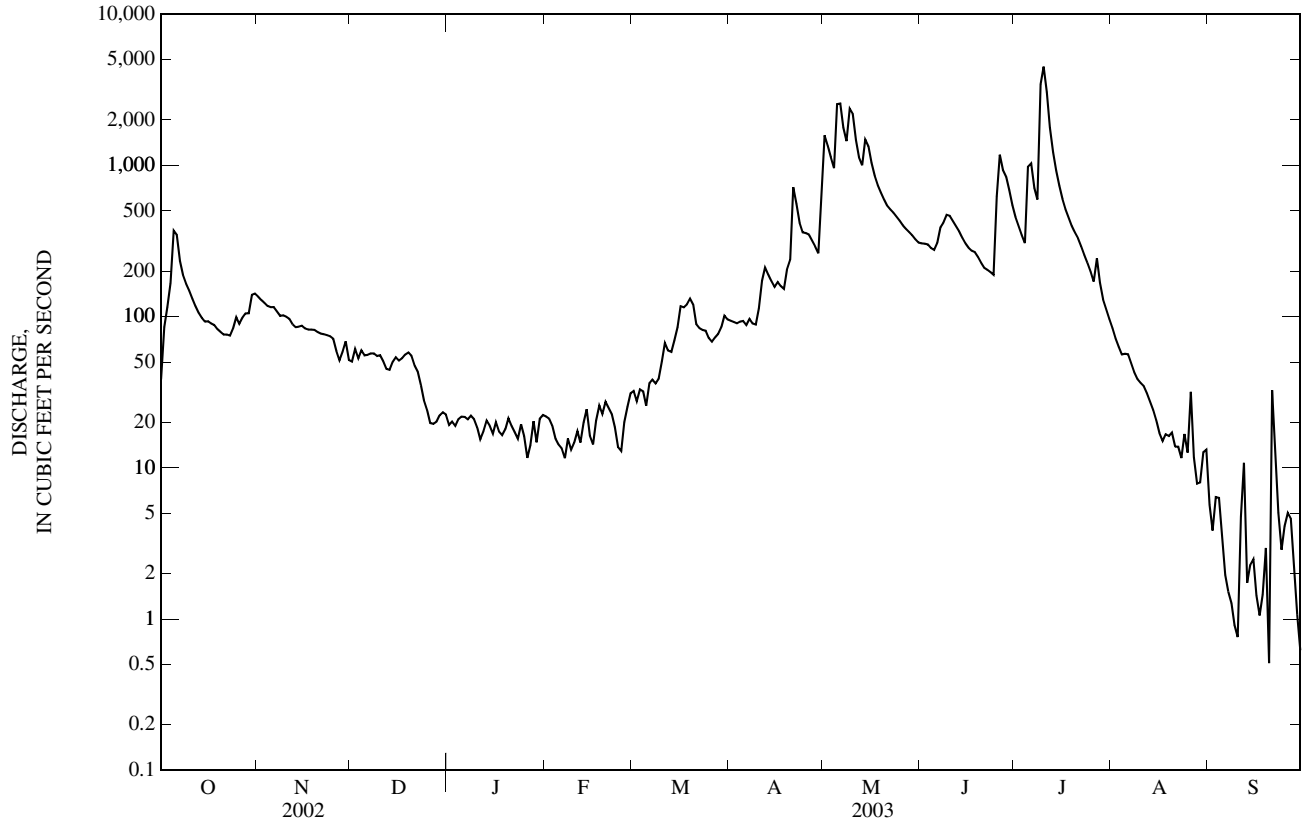
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2003, BY WATER YEAR (WY)

MEAN	160	173	117	78.9	176	521	534	547	794	492	271	154
MAX	1,079	1,270	438	599	919	2,026	2,037	1,421	2,818	5,220	3,921	1,157
(WY)	(1974)	(1973)	(1997)	(1973)	(1973)	(1979)	(1965)	(1974)	(1998)	(1993)	(1993)	(1993)
MIN	0.000	0.005	0.003	0.000	0.000	8.71	3.62	6.71	0.000	0.000	0.032	0.029
(WY)	(1957)	(1977)	(1977)	(1956)	(1956)	(1956)	(1956)	(1967)	(1977)	(1956)	(1956)	(2000)

05471000 SOUTH SKUNK RIVER BELOW SQUAW CREEK NEAR AMES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1953 - 2003	
ANNUAL TOTAL	61,612		89,257.00			
ANNUAL MEAN	169		245		335	
HIGHEST ANNUAL MEAN					1,475	1993
LOWEST ANNUAL MEAN					5.95	1956
HIGHEST DAILY MEAN	2,580	May 12	4,480	Jul 10	20,500	Jul 9, 1993
LOWEST DAILY MEAN	11	Sep 15	0.51	Sep 20	0.00	Dec 17, 1953a
ANNUAL SEVEN-DAY MINIMUM	12	Sep 11	1.7	Sep 14	0.00	Jan 11, 1954
MAXIMUM PEAK FLOW			5,720	Jul 9	26,500	Jul 9, 1993
MAXIMUM PEAK STAGE			19.98	Jul 9	25.57	Jun 27, 1975
INSTANTANEOUS LOW FLOW			0.31	Sep 20	0.00	Dec 17, 1953
ANNUAL RUNOFF (AC-FT)	122,200		177,000		242,500	
ANNUAL RUNOFF (CFSM)	0.30		0.44		0.60	
ANNUAL RUNOFF (INCHES)	4.12		5.97		8.18	
10 PERCENT EXCEEDS	394		596		814	
50 PERCENT EXCEEDS	93		79		104	
90 PERCENT EXCEEDS	38		13		1.1	

a Many days in 1953-56, 1963-68, 1976-77, 2000, 2001.
e Estimated.



05471040 SQUAW CREEK NEAR COLFAX, IA

LOCATION.--Lat 41°39'33", long 93°16'14", in NE¼ NE¼ sec.15, T.79 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on right bank at downstream side of bridge on county road S44 Ave. W., 2 mi southwest of Colfax.

DRAINAGE AREA.--18.4 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1995 to current year.

GAGE.--Water-stage recorder. Datum of gage is 785.96 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	4.6	e4.1	2.8	e2.3	1.6	2.6	25	13	19	13	1.4
2	57	4.7	3.8	e2.6	e2.3	1.6	2.5	15	14	18	13	0.76
3	13	4.8	e3.4	e2.7	e2.4	1.6	2.6	13	15	17	13	0.51
4	9.2	4.8	e3.3	2.8	e2.0	1.7	2.6	62	14	16	4.4	0.44
5	7.3	4.8	e3.1	2.8	e1.7	1.8	2.5	93	14	19	4.1	0.42
6	6.5	4.9	3.4	2.7	e1.5	1.8	2.4	42	18	17	4.4	0.40
7	5.8	4.7	3.5	2.7	e1.3	1.8	2.6	112	24	24	4.4	0.47
8	5.5	4.7	3.4	2.7	e2.0	1.8	2.6	92	32	61	4.1	0.50
9	5.0	4.7	e3.1	2.7	e1.3	1.7	2.6	239	30	109	4.4	0.54
10	5.0	4.6	3.1	e2.5	e1.5	1.7	3.1	74	31	55	4.2	0.60
11	4.8	4.3	3.2	e2.4	1.6	e4.8	3.2	54	29	36	4.1	0.35
12	4.6	4.1	3.3	e2.2	1.5	e14	3.0	43	26	32	4.4	4.7
13	4.4	4.1	3.4	e2.3	1.4	e20	2.9	36	25	30	5.2	0.94
14	4.4	4.1	3.3	e2.3	1.4	e18	2.9	52	24	27	2.5	1.1
15	4.3	4.1	3.4	e2.2	1.4	e11	2.9	39	22	25	1.9	0.73
16	4.2	4.1	3.3	e2.2	1.4	e7.6	3.2	33	21	22	2.0	0.65
17	4.2	4.0	3.3	e1.9	1.4	6.1	3.2	31	21	21	2.3	0.59
18	4.1	4.0	3.5	e2.2	1.4	4.2	2.9	30	20	20	2.6	0.60
19	4.0	3.9	3.4	e1.8	1.4	3.9	4.3	28	20	19	2.7	0.95
20	3.8	3.8	3.4	e2.0	1.4	3.8	11	26	19	19	2.0	0.67
21	3.8	3.8	3.1	e1.7	e7.3	3.5	9.5	24	19	19	1.2	0.90
22	3.7	3.8	3.1	e1.9	e7.1	3.2	8.2	23	19	18	1.2	1.3
23	3.6	3.8	3.2	e1.8	e2.6	3.1	6.8	21	19	18	1.3	0.93
24	3.9	3.8	3.0	e1.9	e1.2	3.0	7.1	20	18	18	1.3	0.79
25	5.3	3.7	2.9	2.0	e0.76	2.9	8.0	19	63	16	1.2	0.77
26	5.3	3.9	2.9	2.0	e1.0	2.7	7.4	17	53	9.1	1.2	0.73
27	4.7	e3.5	2.8	2.1	1.2	2.8	6.2	16	30	9.6	1.1	0.80
28	4.9	3.6	2.9	e2.2	1.4	2.7	5.8	16	29	11	0.93	0.53
29	4.8	3.7	2.9	e2.2	---	2.5	5.0	15	24	11	0.96	0.55
30	4.7	3.7	e2.8	e2.2	---	2.5	17	14	21	11	0.95	0.57
31	4.7	---	e2.7	e2.3	---	2.6	---	13	---	13	1.0	---
TOTAL	208.1	125.1	100.0	70.8	55.16	142.0	146.6	1,337	727	759.7	111.04	25.19
MEAN	6.71	4.17	3.23	2.28	1.97	4.58	4.89	43.1	24.2	24.5	3.58	0.84
MAX	57	4.9	4.1	2.8	7.3	20	17	239	63	109	13	4.7
MIN	1.6	3.5	2.7	1.7	0.76	1.6	2.4	13	13	9.1	0.93	0.35
AC-FT	413	248	198	140	109	282	291	2,650	1,440	1,510	220	50
CFSM	0.36	0.23	0.18	0.12	0.11	0.25	0.27	2.34	1.32	1.33	0.19	0.05
IN.	0.42	0.25	0.20	0.14	0.11	0.29	0.30	2.70	1.47	1.54	0.22	0.05

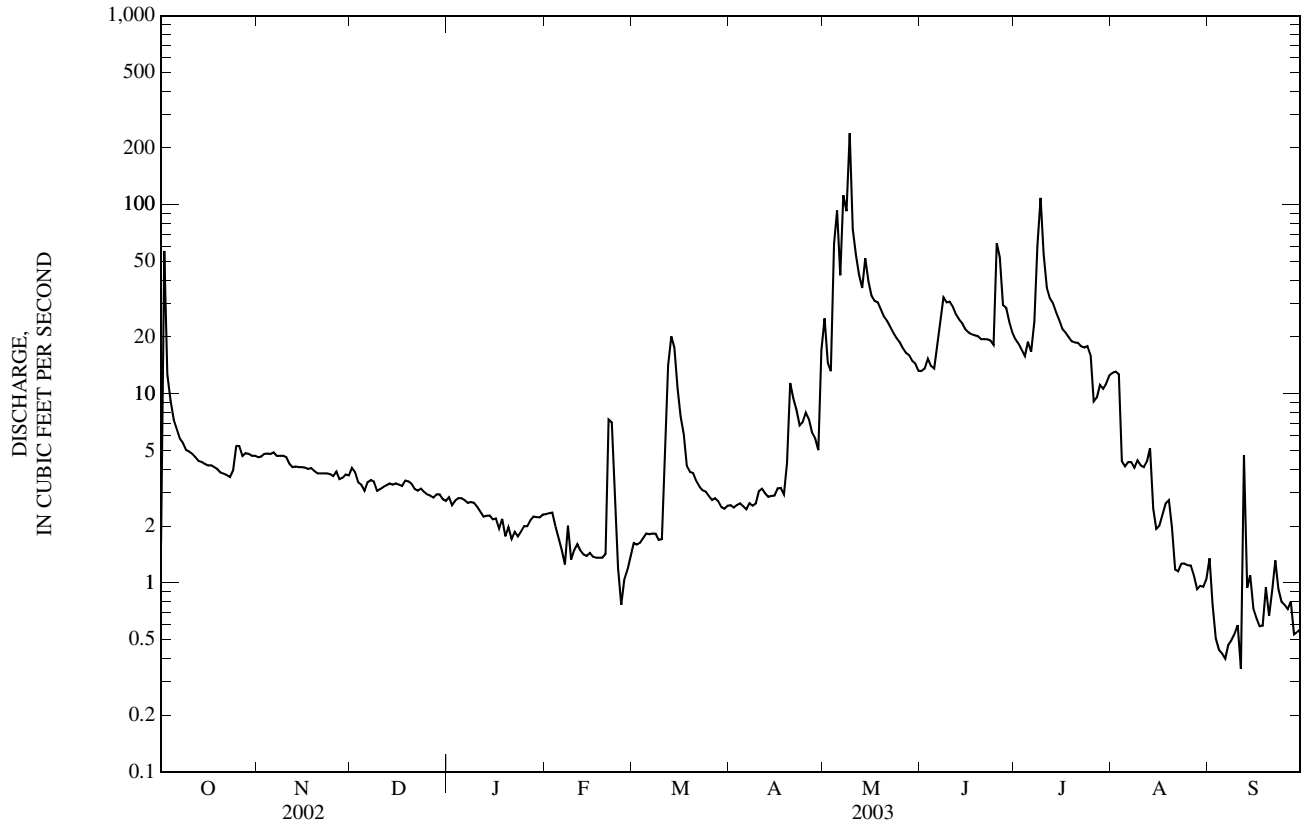
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2003, BY WATER YEAR (WY)

MEAN	3.86	4.20	3.37	3.16	15.1	14.1	12.9	33.5	31.4	13.8	5.52	1.75
MAX	8.91	11.3	9.33	9.52	65.0	48.4	45.4	65.7	83.0	34.3	15.8	3.80
(WY)	(1998)	(1999)	(1998)	(1998)	(1996)	(2001)	(1998)	(1996)	(1998)	(1998)	(1999)	(1998)
MIN	0.90	1.02	0.82	0.84	1.51	1.81	3.03	13.5	12.5	6.78	1.90	0.84
(WY)	(1996)	(2001)	(2001)	(2002)	(2002)	(2002)	(2000)	(2001)	(1997)	(2001)	(2001)	(2003)

05471040 SQUAW CREEK NEAR COLFAX, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1995 - 2003	
ANNUAL TOTAL	2,185.07		3,807.69			
ANNUAL MEAN	5.99		10.4		12.1	
HIGHEST ANNUAL MEAN					25.4	1998
LOWEST ANNUAL MEAN					5.05	2002
HIGHEST DAILY MEAN	122	Jun 13	239	May 9	847	Jun 18, 1998
LOWEST DAILY MEAN	0.27	Jan 1	0.35	Sep 11	0.27	Jan 1, 2002
ANNUAL SEVEN-DAY MINIMUM	0.45	Jan 1	0.47	Sep 3	0.37	Dec 29, 2001
MAXIMUM PEAK FLOW			765	May 9	7,020	Jun 18, 1998
MAXIMUM PEAK STAGE			10.66	May 9	13.94	Jun 18, 1998
INSTANTANEOUS LOW FLOW			0.00	Sep 11	0.00	Sep 11, 2003
ANNUAL RUNOFF (AC-FT)	4,330		7,550		8,740	
ANNUAL RUNOFF (CFSM)	0.33		0.57		0.66	
ANNUAL RUNOFF (INCHES)	4.42		7.70		8.91	
10 PERCENT EXCEEDS	12		25		28	
50 PERCENT EXCEEDS	3.4		3.8		4.2	
90 PERCENT EXCEEDS	1.0		1.2		1.0	

e Estimated



05471040 SQUAW CREEK NEAR COLFAX, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1995 to current year.
WATER TEMPERATURES: May 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: May 1995 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 680 microsiemens Jan. 4, 2002; minimum daily, 170 microsiemens May 24, 1996.
WATER TEMPERATURES: Maximum daily, 32.0°C July 29, 1999; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,270 mg/L May 24, 1996; minimum daily mean, 6.0 mg/L Apr. 22, 1996.
SEDIMENT LOADS: Maximum daily, 11,400 tons June 18, 1998; minimum daily, 0.01 tons Jan. 6, 7, 1996, and Oct. 4, 8, 2001.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 651 microsiemens Sept. 16; minimum daily, 305 microsiemens Mar. 13.
WATER TEMPERATURES: Maximum daily, 29.0°C Aug. 26; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,590 mg/L May 9; minimum daily mean, 8.0 mg/L Feb. 27.
SEDIMENT LOADS: Maximum daily, 1,620 tons May 9; minimum daily, 0.02 tons Feb. 25, 26, Sept. 6, 7.

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	551	459	446	455	508	---	538	547	480	572	520	558
2	365	517	519	476	524	---	537	543	563	561	575	558
3	585	534	524	461	465	551	526	---	541	554	---	599
4	594	526	455	424	455	544	475	422	504	---	472	---
5	---	554	445	427	461	507	509	532	542	---	571	---
6	564	515	481	470	543	469	---	544	528	594	575	---
7	533	---	---	437	---	468	452	511	---	520	528	541
8	554	---	463	452	---	---	496	531	588	532	508	553
9	484	---	488	443	---	462	532	498	586	506	582	530
10	464	---	425	460	478	461	530	533	574	580	581	551
11	522	472	476	512	435	526	535	541	554	577	574	555
12	---	492	572	481	428	340	528	546	517	---	452	474
13	---	498	459	503	494	305	535	551	563	---	493	---
14	453	522	---	484	548	314	529	535	---	---	434	626
15	514	499	479	451	---	395	485	545	573	---	---	643
16	443	---	469	474	530	446	499	549	522	---	---	651
17	---	556	458	635	459	517	492	551	493	---	---	626
18	487	427	532	492	448	524	540	---	539	---	---	---
19	449	503	470	445	549	524	---	553	576	---	---	599
20	552	505	446	432	519	549	556	566	---	473	---	578
21	543	481	439	461	404	544	548	552	---	580	---	---
22	448	446	---	470	---	---	551	560	---	578	---	571
23	491	477	440	---	504	---	540	517	---	515	---	631
24	585	432	423	---	567	544	520	---	---	548	517	629
25	586	454	---	---	581	---	546	---	---	483	555	---
26	---	489	492	524	574	---	553	541	---	592	554	---
27	---	471	471	619	561	---	544	472	---	590	582	---
28	589	---	---	629	558	---	532	545	---	587	595	570
29	541	450	458	564	---	---	539	466	584	503	568	577
30	---	---	414	518	---	533	517	566	590	563	569	---
31	532	---	438	472	---	489	---	---	---	529	---	---

05471040 SQUAW CREEK NEAR COLFAX, IA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	4.0	1.0	1.0	0.0	---	17.0	10.0	17.0	23.5	22.0	22.0
2	16.2	4.0	0.0	1.0	0.0	---	18.0	14.0	11.0	22.0	21.0	23.0
3	13.0	5.0	0.0	0.0	0.0	0.0	15.0	---	13.0	23.0	---	21.0
4	15.0	4.0	0.0	2.0	0.0	0.0	4.0	9.0	16.0	---	23.0	---
5	---	5.0	0.0	1.0	0.0	0.0	5.0	11.0	16.0	---	20.0	---
6	14.0	7.0	1.0	1.0	0.0	0.0	---	14.0	15.0	21.0	22.0	---
7	12.0	---	---	2.0	---	0.0	3.0	13.0	---	23.0	23.0	24.0
8	14.0	---	0.0	3.0	---	---	6.0	10.0	15.0	19.0	23.0	24.0
9	14.0	---	0.0	1.0	---	0.0	10.0	15.0	18.0	20.0	23.0	23.0
10	16.0	---	0.0	0.0	0.0	0.0	12.0	12.0	17.0	18.0	22.0	24.0
11	15.0	4.0	1.0	0.0	0.0	0.0	15.0	9.0	17.0	18.0	24.0	25.0
12	---	5.0	1.0	0.0	0.0	0.0	15.0	14.0	17.0	---	22.0	21.0
13	---	6.0	1.0	0.0	0.0	1.0	15.0	14.0	18.0	---	23.0	---
14	11.0	5.0	---	0.0	0.0	2.0	21.0	14.0	---	---	21.0	18.0
15	11.0	4.0	2.0	0.0	---	4.0	19.0	12.0	19.0	---	---	21.0
16	8.0	---	1.0	0.0	0.0	4.0	16.0	14.0	19.0	---	---	23.0
17	---	3.0	2.5	0.0	0.0	10.0	10.0	15.0	19.0	---	---	23.0
18	11.0	1.0	4.0	0.0	0.0	10.0	9.0	---	18.0	---	---	---
19	9.0	5.0	3.0	0.0	0.0	5.0	---	14.0	17.0	---	---	18.0
20	8.0	7.0	1.0	0.0	0.0	6.0	9.0	13.0	---	21.0	---	16.0
21	8.0	5.0	1.0	0.0	0.3	5.0	12.0	10.0	---	22.0	---	---
22	8.0	4.0	---	0.0	---	---	15.0	15.0	---	20.0	---	16.0
23	6.0	4.0	1.0	---	0.0	---	14.0	15.0	---	21.0	---	16.0
24	5.0	2.0	0.0	---	0.0	12.0	9.0	---	---	21.0	27.0	16.0
25	8.0	1.0	---	---	0.0	---	15.0	---	---	23.0	28.0	---
26	---	1.0	0.0	0.0	0.0	---	16.0	17.0	---	25.0	29.0	---
27	---	1.0	0.0	0.0	0.0	---	17.0	18.0	---	20.0	28.0	---
28	7.0	---	---	0.0	0.0	---	16.0	18.0	---	23.0	24.0	13.0
29	8.0	2.0	0.0	0.0	---	---	11.0	17.0	18.0	23.0	26.0	13.0
30	---	---	1.0	0.0	---	7.0	10.0	19.0	20.0	22.0	21.0	---
31	5.0	---	1.0	0.0	---	10.0	---	---	---	22.0	---	---

05471040 SQUAW CREEK NEAR COLFAX, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

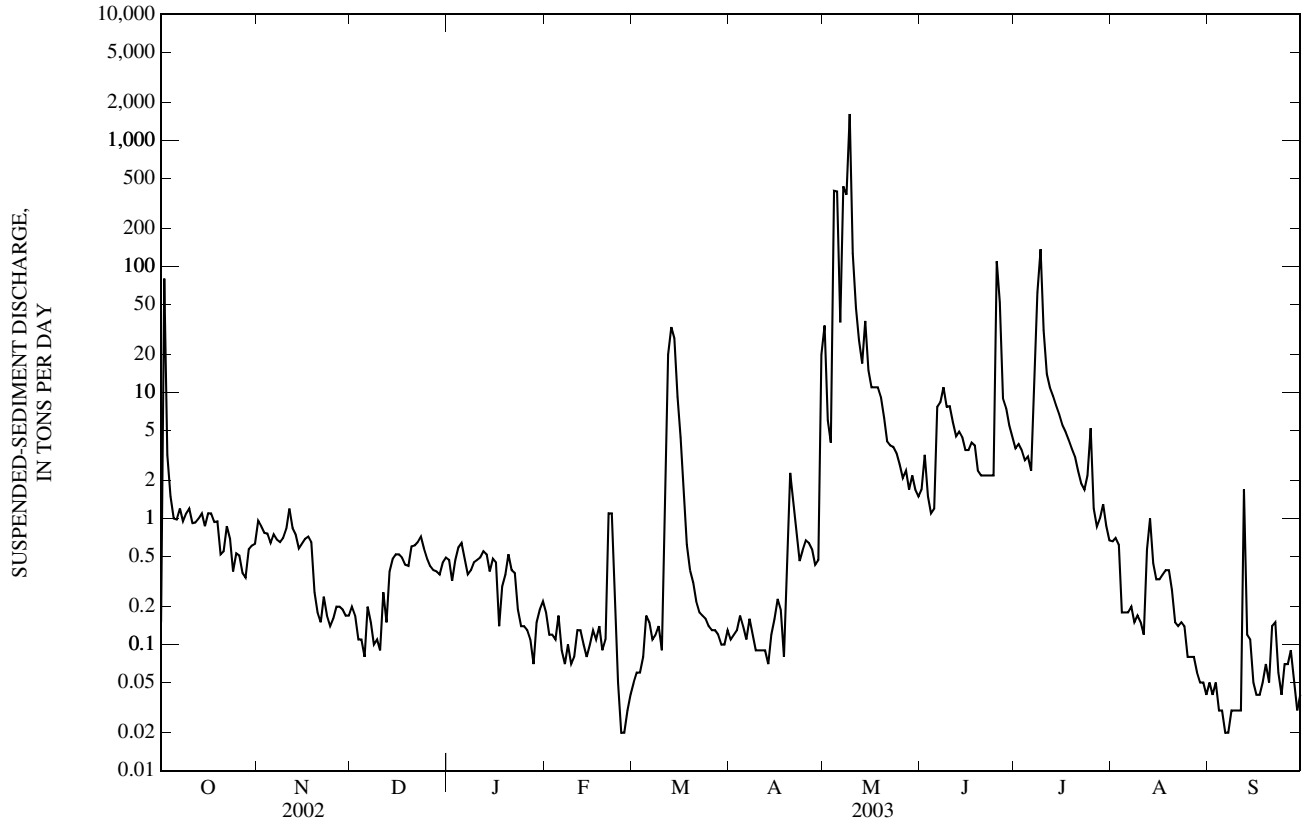
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	35	0.15	77	0.96	18	0.20	61	0.47	29	0.18	11	0.05
2	332	80	70	0.87	16	0.17	46	0.32	19	0.12	13	0.06
3	91	3.2	60	0.77	12	0.11	64	0.47	19	0.12	15	0.06
4	59	1.5	59	0.76	12	0.11	78	0.59	21	0.11	16	0.08
5	52	1.0	50	0.64	10	0.08	84	0.64	37	0.17	33	0.17
6	56	0.98	57	0.75	22	0.20	64	0.48	23	0.09	31	0.15
7	75	1.2	54	0.68	15	0.15	51	0.36	19	0.07	22	0.11
8	63	0.95	52	0.65	11	0.10	54	0.39	19	0.10	24	0.12
9	78	1.1	55	0.70	13	0.11	63	0.45	19	0.07	30	0.14
10	93	1.2	67	0.83	10	0.09	69	0.47	20	0.08	20	0.09
11	71	0.92	106	1.2	30	0.26	76	0.49	31	0.13	169	2.2
12	75	0.93	75	0.84	17	0.15	92	0.55	31	0.13	532	20
13	85	1.0	67	0.75	42	0.38	84	0.52	26	0.10	618	33
14	93	1.1	52	0.58	54	0.48	61	0.38	20	0.08	553	27
15	75	0.87	56	0.63	57	0.52	80	0.48	26	0.10	310	9.2
16	100	1.1	62	0.69	59	0.52	75	0.45	35	0.13	212	4.4
17	98	1.1	67	0.72	55	0.49	28	0.14	30	0.11	98	1.6
18	84	0.94	59	0.65	46	0.43	48	0.29	39	0.14	55	0.62
19	89	0.95	25	0.26	45	0.42	75	0.36	25	0.09	37	0.39
20	50	0.52	17	0.18	67	0.60	96	0.52	30	0.11	30	0.31
21	54	0.55	14	0.15	72	0.61	84	0.39	55	1.1	23	0.22
22	87	0.87	23	0.24	78	0.65	73	0.37	59	1.1	21	0.18
23	71	0.69	17	0.17	85	0.72	39	0.19	30	0.21	20	0.17
24	36	0.38	14	0.14	71	0.58	28	0.14	15	0.05	19	0.16
25	37	0.53	16	0.16	61	0.48	26	0.14	10	0.02	18	0.14
26	35	0.51	19	0.20	54	0.42	24	0.13	9	0.02	17	0.13
27	30	0.37	21	0.20	51	0.39	19	0.11	8	0.03	17	0.13
28	26	0.34	20	0.19	48	0.38	11	0.07	10	0.04	16	0.12
29	44	0.57	17	0.17	45	0.36	25	0.15	---	---	15	0.10
30	49	0.61	17	0.17	59	0.45	32	0.19	---	---	15	0.10
31	50	0.63	---	---	67	0.49	35	0.22	---	---	19	0.13
TOTAL	---	106.76	---	15.90	---	11.10	---	10.92	---	4.80	---	101.33

05471040 SQUAW CREEK NEAR COLFAX, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	16	0.11	466	34	47	1.7	69	3.6	19	0.66	15	0.05
2	17	0.12	151	6.0	87	3.2	79	3.9	20	0.70	22	0.04
3	18	0.13	113	4.0	36	1.5	76	3.5	18	0.62	38	0.05
4	23	0.17	1,200	398	28	1.1	68	2.9	15	0.18	27	0.03
5	20	0.14	1,230	393	32	1.2	60	3.1	16	0.18	23	0.03
6	17	0.11	306	36	146	7.7	54	2.4	16	0.18	19	0.02
7	22	0.16	1,120	432	130	8.4	96	11	17	0.20	15	0.02
8	18	0.12	626	371	124	11	339	62	14	0.15	19	0.03
9	13	0.09	1,590	1,620	94	7.7	401	137	14	0.17	19	0.03
10	11	0.09	622	127	94	7.8	203	31	13	0.15	18	0.03
11	11	0.09	319	47	75	5.8	137	14	11	0.12	25	0.03
12	11	0.09	220	26	64	4.5	124	11	46	0.57	113	1.7
13	9	0.07	171	17	74	4.9	116	9.4	74	1.0	45	0.12
14	15	0.12	254	37	69	4.4	108	7.9	65	0.44	35	0.11
15	21	0.16	142	15	59	3.5	101	6.7	63	0.33	23	0.05
16	27	0.23	118	11	62	3.5	93	5.5	60	0.33	25	0.04
17	22	0.19	134	11	72	4.0	85	4.9	58	0.36	22	0.04
18	10	0.08	132	11	69	3.8	78	4.2	55	0.39	31	0.05
19	17	0.32	122	9.2	45	2.4	70	3.6	53	0.39	28	0.07
20	74	2.3	91	6.3	41	2.2	62	3.1	50	0.27	26	0.05
21	49	1.3	62	4.1	42	2.2	47	2.4	48	0.15	52	0.14
22	34	0.76	62	3.8	43	2.2	40	1.9	46	0.14	40	0.15
23	25	0.46	66	3.7	44	2.2	35	1.7	43	0.15	24	0.06
24	27	0.56	61	3.3	44	2.2	47	2.2	40	0.14	16	0.04
25	31	0.67	52	2.7	276	110	120	5.2	24	0.08	35	0.07
26	32	0.64	44	2.1	292	52	51	1.2	23	0.08	33	0.07
27	33	0.57	54	2.4	112	9.0	33	0.86	26	0.08	41	0.09
28	27	0.43	40	1.7	98	7.5	34	1.0	25	0.06	30	0.05
29	34	0.47	54	2.2	84	5.5	46	1.3	20	0.05	20	0.03
30	314	20	44	1.7	76	4.4	29	0.88	18	0.05	24	0.04
31	---	---	41	1.5	---	---	20	0.67	16	0.04	---	---
TOTAL	---	30.75	---	3,640.7	---	287.5	---	350.01	---	8.41	---	3.33
YEAR	4,571.51											

05471040 SQUAW CREEK NEAR COLFAX, IA—Continued



05471040 SQUAW CREEK NEAR COLFAX, IA—Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--July 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

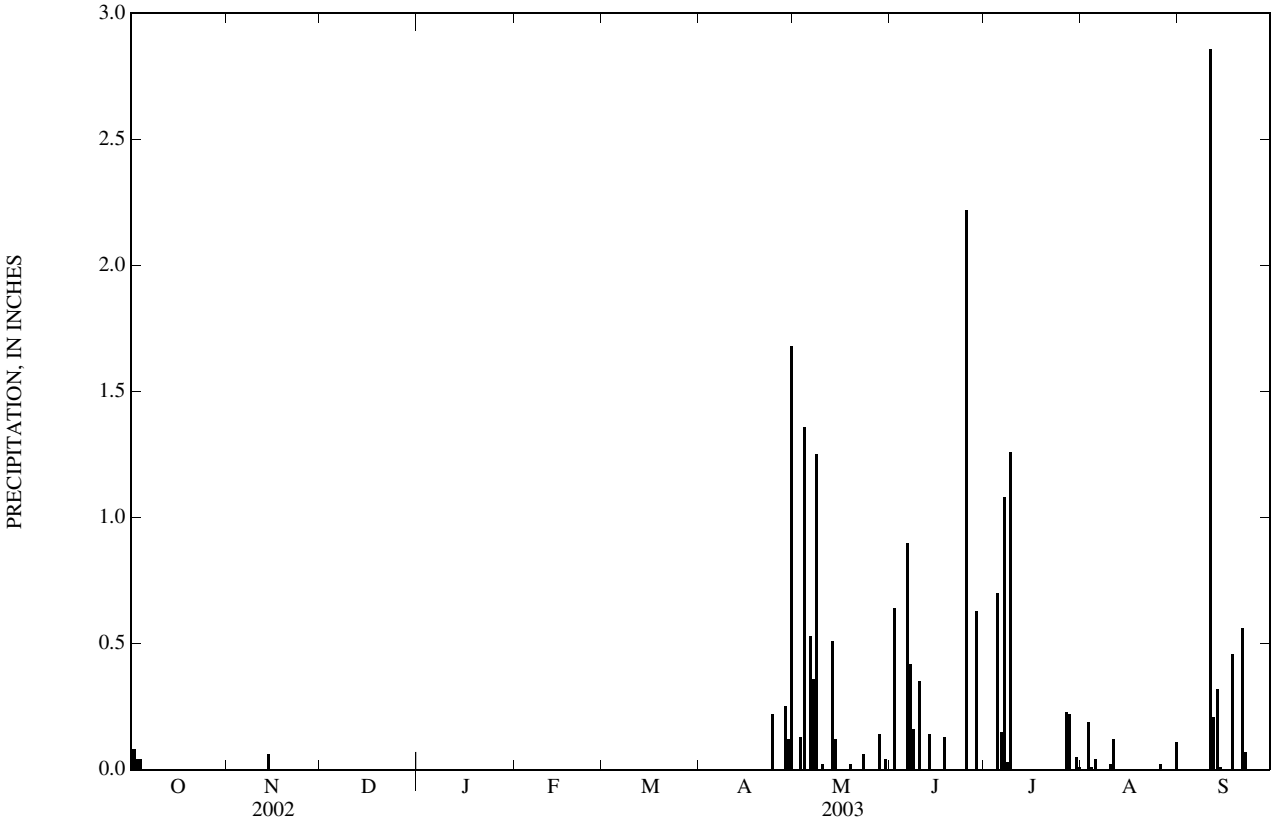
EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.86 in., Sept. 11, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.86 in., Sept. 11.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.08	0.00	0.00	0.00	---	---	---	0.00	0.00	0.00	0.00	0.00
2	0.08	0.00	0.00	0.00	---	---	---	0.00	0.64	0.00	0.00	0.00
3	0.04	0.00	0.00	0.00	---	---	---	0.13	0.00	0.00	0.19	0.00
4	0.04	0.00	0.00	0.00	0.00	---	---	1.36	0.00	0.00	0.01	0.00
5	0.00	0.00	0.00	0.00	---	---	---	0.00	0.00	0.70	0.04	0.00
6	0.00	0.00	0.00	0.00	---	---	---	0.53	0.90	0.15	0.00	0.00
7	0.00	0.00	0.00	0.00	---	---	---	0.36	0.42	1.08	0.00	0.00
8	0.00	0.00	0.00	0.00	---	---	---	1.25	0.16	0.03	0.00	0.00
9	0.00	0.00	0.00	0.00	---	---	---	0.00	0.00	1.26	0.00	0.00
10	0.00	0.00	0.00	0.00	---	---	---	0.02	0.35	0.00	0.02	0.00
11	0.00	0.00	0.00	0.00	---	---	---	0.00	0.00	0.00	0.12	2.86
12	0.00	0.00	0.00	0.00	---	---	---	0.00	0.00	0.00	0.00	0.21
13	0.00	0.00	0.00	0.00	---	---	---	0.51	0.14	0.00	0.00	0.32
14	0.00	0.06	0.00	0.00	---	---	---	0.12	0.00	0.00	0.00	0.01
15	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.13	0.00	0.00	0.46
19	0.00	0.00	0.00	0.00	---	---	0.00	0.02	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.56
22	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.07
23	0.00	0.00	0.00	0.00	---	---	0.00	0.06	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	---	---	0.22	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	---	---	0.00	0.00	2.22	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.02	0.00
27	0.00	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.23	0.00	0.00
28	0.00	0.00	0.00	0.00	---	---	0.25	0.14	0.63	0.22	0.00	0.00
29	0.00	0.00	0.00	0.00	---	---	0.12	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	---	---	1.68	0.04	0.00	0.05	0.00	0.00
31	0.00	---	0.00	---	---	---	---	0.00	---	0.01	0.11	---
TOTAL	0.24	0.06	0.00	---	---	---	---	4.54	5.59	3.73	0.51	4.49
MEAN	0.01	0.00	0.00	---	---	---	---	0.15	0.19	0.12	0.02	0.15
MAX	0.08	0.06	0.00	---	---	---	---	1.36	2.22	1.26	0.19	2.86
MIN	0.00	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	0.00

05471040 SQUAW CREEK NEAR COLFAX, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05471050 SOUTH SKUNK RIVER AT COLFAX, IA

LOCATION.--Lat 41°40'55", long 93°14'47", in NE¼ NE¼ SW¼ sec.1, T.79 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on left bank 15 ft downstream of bridge on State Highway 117 at north edge of Colfax, 1 mi downstream from Sugar Creek, 2.8 mi upstream from Indian Creek, and at mile 191 upstream from mouth of Skunk River.

DRAINAGE AREA.--803 mi^2.

PERIOD OF RECORD.--June 1974 to June 1977, (operated as a partial-record low-flow measurement site), October 1985 to current year.

REVISED RECORDS.--Daily discharge for Aug. 26, 27, and Sept. 6-30, 2000.

GAGE.--Water-stage recorder. Datum of gage is 770.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	180	71	e38	e36	e48	122	1,800	553	e710	278	40
2	e195	175	81	e40	e34	e38	113	1,700	538	619	255	38
3	169	169	e69	e38	e33	e42	108	1,220	565	560	232	36
4	153	163	78	e41	e31	e39	106	1,430	551	510	212	34
5	220	162	e75	e42	e30	e31	110	2,900	532	668	193	35
6	374	154	e78	e42	e30	e45	116	3,260	554	1,290	181	34
7	356	146	e81	e40	e30	e50	115	2,830	624	1,140	167	31
8	290	140	e81	e42	e33	e47	120	2,210	726	1,070	148	30
9	251	133	79	e41	e29	e42	118	3,630	780	1,850	138	30
10	228	130	79	e38	e30	51	121	3,450	837	4,750	126	29
11	213	123	85	e33	e33	57	130	2,440	790	4,200	124	33
12	198	120	83	e35	e28	e89	182	1,820	735	2,920	117	59
13	187	118	e80	e37	e33	e108	219	1,490	689	1,900	110	39
14	180	113	89	e35	e41	e114	207	1,710	634	1,410	101	37
15	168	105	94	e33	e33	e147	186	2,020	586	1,140	94	34
16	147	108	88	e34	e29	265	183	1,660	548	939	87	33
17	146	105	86	e31	e36	282	196	1,380	518	882	78	32
18	142	101	96	e30	e43	242	190	1,200	507	804	70	32
19	135	99	84	e31	e38	212	200	1,080	501	716	64	34
20	126	100	81	e33	e48	211	274	978	467	650	60	32
21	e120	98	80	e29	e45	183	567	891	446	603	56	35
22	e114	94	75	e26	e36	152	602	888	432	552	52	38
23	112	94	60	e23	e29	137	485	876	426	502	49	46
24	118	91	e48	e29	e24	126	428	834	418	457	45	36
25	136	85	e44	e26	e21	117	415	789	488	423	45	32
26	143	e76	e40	e23	e29	106	388	747	1,300	387	43	33
27	132	70	e40	e27	e38	104	375	703	1,670	363	52	33
28	141	e76	e40	e34	e45	105	356	676	e1,310	440	42	33
29	146	e89	e42	e29	---	101	335	642	e1,110	350	40	33
30	146	e72	e44	e35	---	104	983	620	e838	317	38	32
31	176	---	e43	e36	---	122	---	591	---	300	40	---
TOTAL	5,424	3,489	2,194	1,051	945	3,517	8,050	48,465	20,673	33,422	3,337	1,053
MEAN	175	116	70.8	33.9	33.8	113	268	1,563	689	1,078	108	35.1
MAX	374	180	96	42	48	282	983	3,630	1,670	4,750	278	59
MIN	62	70	40	23	21	31	106	591	418	300	38	29
AC-FT	10,760	6,920	4,350	2,080	1,870	6,980	15,970	96,130	41,000	66,290	6,620	2,090
CFSM	0.22	0.14	0.09	0.04	0.04	0.14	0.33	1.95	0.86	1.34	0.13	0.04
IN.	0.25	0.16	0.10	0.05	0.04	0.16	0.37	2.25	0.96	1.55	0.15	0.05

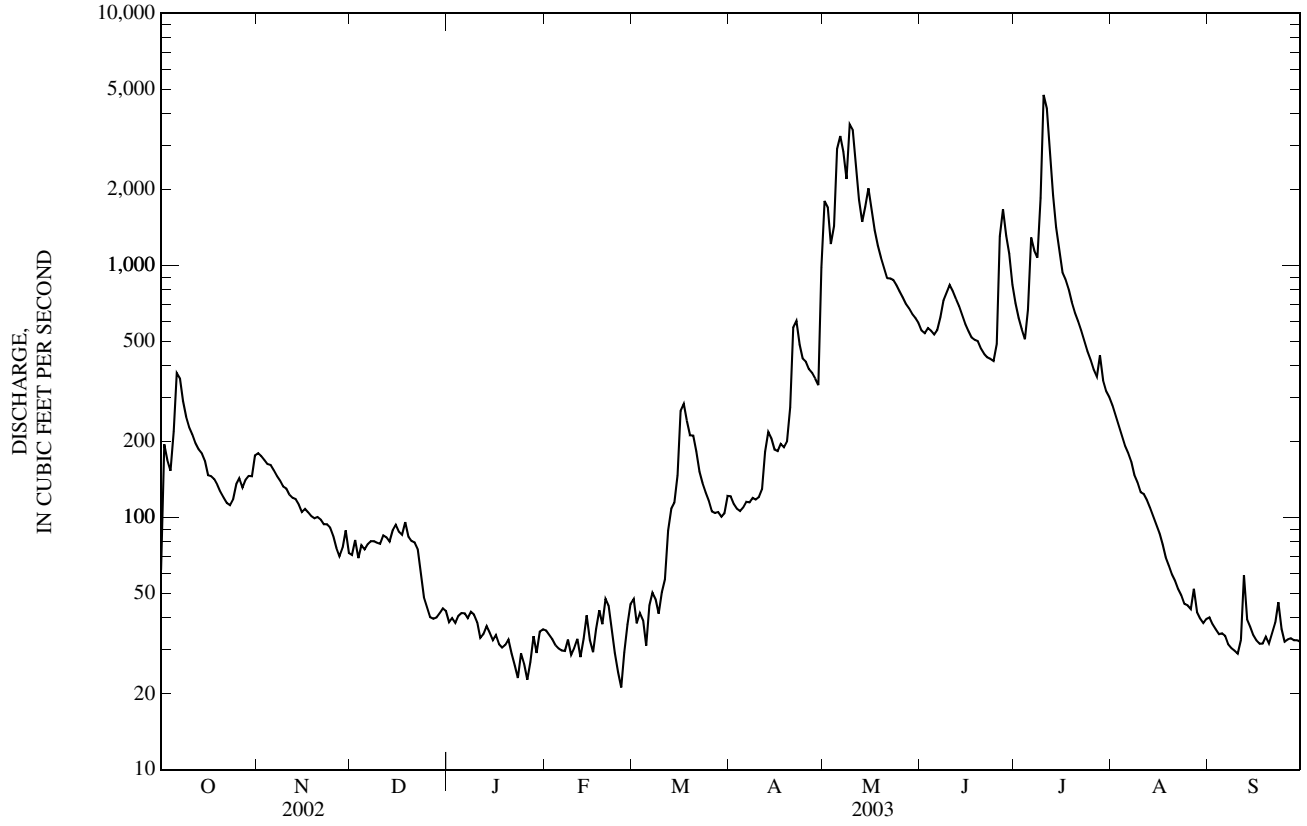
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 2003, BY WATER YEAR (WY)

MEAN	287	266	238	153	301	725	827	1,093	1,313	942	470	269
MAX	1,807	981	626	451	849	2,094	2,435	2,481	3,844	5,640	3,549	1,911
(WY)	(1987)	(1997)	(1993)	(1992)	(1997)	(1993)	(1991)	(1991)	(1998)	(1993)	(1993)	(1993)
MIN	11.9	17.5	12.4	12.3	16.2	77.5	57.0	113	96.7	31.8	12.6	6.75
(WY)	(1989)	(1989)	(1989)	(1989)	(1990)	(2000)	(2000)	(2000)	(1988)	(1988)	(1988)	(1988)

05471050 SOUTH SKUNK RIVER AT COLFAX, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1986 - 2003	
ANNUAL TOTAL	89,322		131,620			
ANNUAL MEAN	245		361		575	
HIGHEST ANNUAL MEAN					1,831	1993
LOWEST ANNUAL MEAN					69.6	1989
HIGHEST DAILY MEAN	2,540	May 13	4,750	Jul 10	13,100	Jul 12, 1993
LOWEST DAILY MEAN	39	Sep 17	21	Feb 25a	1.4	Aug 18, 1988
ANNUAL SEVEN-DAY MINIMUM	41	Sep 12	26	Jan 21	3.2	Sep 8, 1988
MAXIMUM PEAK FLOW			4,920	Jul 10	14,200	Jul 12, 1993
MAXIMUM PEAK STAGE			15.61	Jul 10	21.53	Jul 12, 1993
INSTANTANEOUS LOW FLOW					1.2	Aug 18, 1988b
ANNUAL RUNOFF (AC-FT)	177,200		261,100		416,300	
ANNUAL RUNOFF (CFSM)	0.30		0.45		0.72	
ANNUAL RUNOFF (INCHES)	4.14		6.10		9.72	
10 PERCENT EXCEEDS	576		910		1,400	
50 PERCENT EXCEEDS	142		115		240	
90 PERCENT EXCEEDS	70		33		34	

a Ice affected.
b Also Aug. 19, 1988.
e Estimated.



05471200 INDIAN CREEK NEAR MINGO, IA

LOCATION.--Lat 41°48'30", long 93°18'53", in NW¼ NW¼ sec.28, T.81 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on left bank 20 ft downstream from bridge on State Highway 117, 0.7 mi downstream from Wolf Creek, 2.2 mi upstream from Byers Branch, 2.9 mi northwest of Mingo, and 11.3 mi upstream from South Skunk River.

DRAINAGE AREA.--276 mi^2.

PERIOD OF RECORD.--May 1958 to September 1975; October 1985 to current year.

REVISED RECORDS.--WSP 1728: 1958 (M), 1959 (M).

GAGE.--Water-stage recorder. Datum of gage is 810.47 ft above NGVD of 1929.

REMARKS.--Records fair except those for estimated daily discharge, which are poor. U.S. Geological Survey satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 20, 1944, reached a stage of 21.4 ft, from information by local resident, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	24	e24	e21	e11	e16	25	e837	134	175	46	8.0
2	14	22	e26	e21	e10	e8.9	23	e696	134	155	41	7.7
3	19	22	e27	e22	e9.5	e10	23	e342	142	e150	e38	7.2
4	17	22	e27	e22	e7.9	e9.3	25	e468	136	e140	e32	7.0
5	16	23	25	e18	e6.8	e7.9	26	e875	133	e330	27	20
6	15	24	27	e16	e6.3	e21	26	e1,080	140	e460	26	27
7	13	23	27	e22	e4.7	e26	29	e868	149	e320	25	14
8	13	23	27	e14	e7.8	e22	29	431	185	e250	23	8.4
9	12	21	e28	e10	e6.9	e19	28	2,250	204	e600	21	7.0
10	13	20	31	e9.4	e8.6	e29	30	e1,060	209	e1,330	19	6.3
11	13	19	32	e9.6	e11	e45	31	e715	195	e750	19	6.9
12	13	20	e29	e9.8	e8.8	e53	35	e533	180	e480	17	11
13	12	20	e27	e8.8	e13	e54	37	e443	169	e350	16	10
14	12	20	29	e8.2	e17	e59	36	e665	154	e280	15	7.7
15	12	19	28	e9.2	e11	e70	34	e749	143	e230	15	6.6
16	12	19	21	e8.4	e8.0	e95	35	e550	135	e190	14	6.0
17	13	20	19	e6.2	e12	e77	43	e438	129	174	13	5.6
18	13	20	22	e6.2	e19	67	e46	e364	126	155	13	5.8
19	13	19	19	e5.3	e17	61	e59	331	132	136	12	5.8
20	13	19	18	e10	e22	56	e84	295	111	122	12	5.4
21	13	19	e16	e6.9	e20	48	e110	265	102	113	11	6.9
22	13	20	e16	e5.6	e17	44	e137	248	97	100	11	7.7
23	13	19	e20	e5.0	e12	41	e93	e250	96	86	11	7.8
24	15	18	e18	e9.8	e7.8	37	e72	e240	97	77	10	6.0
25	20	22	e17	e7.0	e6.1	35	e80	e230	e100	71	9.5	5.1
26	22	22	e16	e4.2	e9.7	31	e70	e210	144	65	10	4.9
27	20	e26	e21	e6.0	e13	32	e69	e200	203	74	14	5.0
28	21	e30	e19	e9.8	e15	31	e67	e190	267	86	11	4.8
29	23	28	e18	e6.4	---	30	e63	e170	242	64	9.0	4.5
30	23	19	e16	e10	---	28	e604	161	204	56	8.2	4.2
31	23	---	e19	e11	---	27	---	146	---	52	8.0	---
TOTAL	472.4	642	709	338.8	318.9	1,190.1	2,069	16,300	4,592	7,621	556.7	240.3
MEAN	15.2	21.4	22.9	10.9	11.4	38.4	69.0	526	153	246	18.0	8.01
MAX	23	30	32	22	22	95	604	2,250	267	1,330	46	27
MIN	8.4	18	16	4.2	4.7	7.9	23	146	96	52	8.0	4.2
AC-FT	937	1,270	1,410	672	633	2,360	4,100	32,330	9,110	15,120	1,100	477
CFSM	0.06	0.08	0.08	0.04	0.04	0.14	0.25	1.91	0.55	0.89	0.07	0.03
IN.	0.06	0.09	0.10	0.05	0.04	0.16	0.28	2.20	0.62	1.03	0.08	0.03

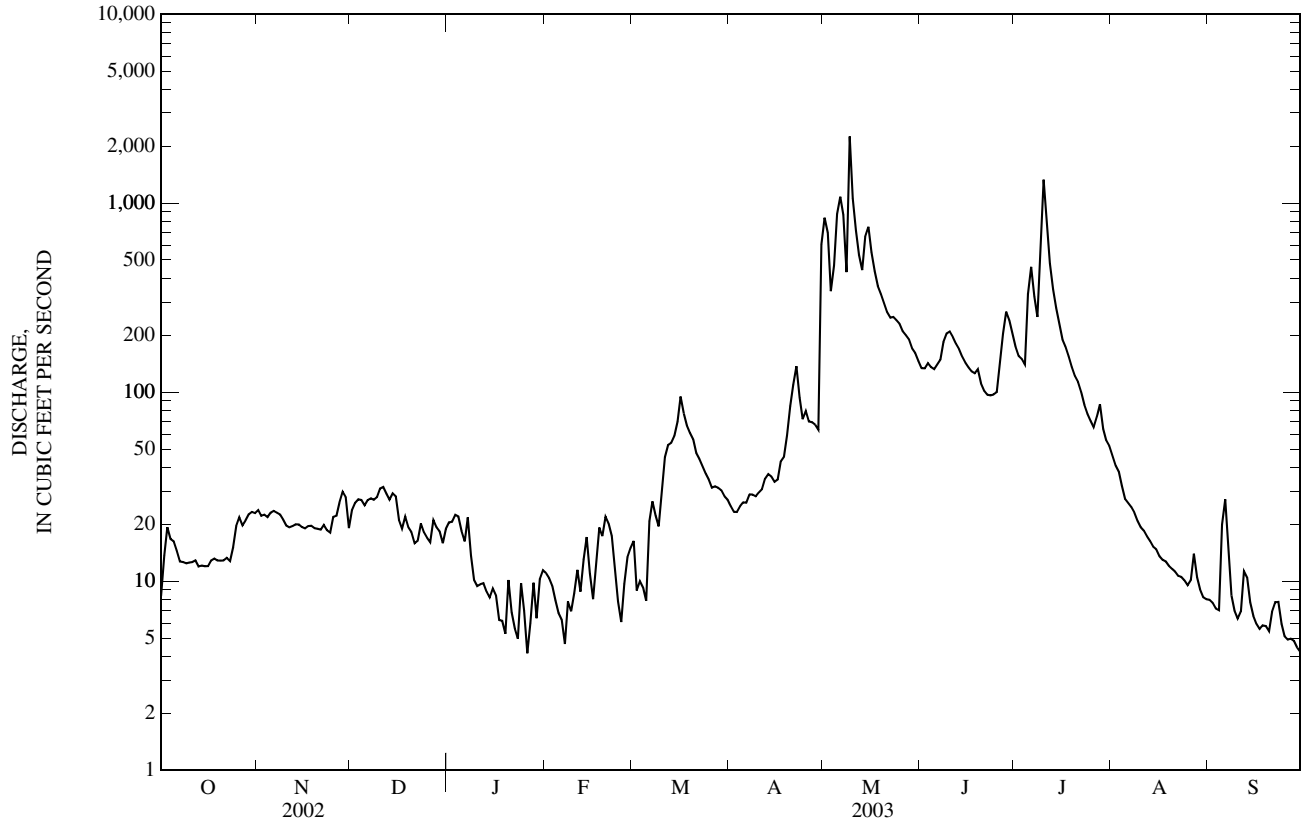
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	102	93.1	76.0	56.5	113	292	271	375	490	304	144	81.8
MAX	689	549	319	289	619	816	834	936	1,732	2,809	1,500	678
(WY)	(1987)	(1973)	(1973)	(1973)	(1971)	(1993)	(1965)	(1974)	(1998)	(1993)	(1993)	(1993)
MIN	1.11	4.12	2.05	1.87	2.25	10.9	8.07	5.58	10.9	3.49	1.44	0.91
(WY)	(1972)	(1968)	(1990)	(1968)	(1967)	(1968)	(1989)	(1967)	(1989)	(1988)	(1988)	(1988)

05471200 INDIAN CREEK NEAR MINGO, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003	
ANNUAL TOTAL	36,999.6		35,050.2			
ANNUAL MEAN	101		96.0		200	
HIGHEST ANNUAL MEAN					751	1993
LOWEST ANNUAL MEAN					11.9	1989
HIGHEST DAILY MEAN	2,040	Jun 13	2,250	May 9	12,000	Jul 10, 1993
LOWEST DAILY MEAN	1.6	Mar 27	4.2	Jan 26ab	0.01	Aug 18, 1989
ANNUAL SEVEN-DAY MINIMUM	2.9	Apr 4	4.9	Sep 24	0.15	Aug 16, 1989
MAXIMUM PEAK FLOW			2,830	May 9	23,500	Jun 4, 1991
MAXIMUM PEAK STAGE			11.29	May 9	19.16	Jun 4, 1991
ANNUAL RUNOFF (AC-FT)	73,390		69,520		145,000	
ANNUAL RUNOFF (CFSM)	0.37		0.35		0.73	
ANNUAL RUNOFF (INCHES)	4.99		4.72		9.85	
10 PERCENT EXCEEDS	242		241		473	
50 PERCENT EXCEEDS	27		22		68	
90 PERCENT EXCEEDS	9.7		7.7		5.0	

a Ice affected.
b Also Sept. 30.
e Estimated.



05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA

LOCATION.--Lat 41°21'21", long 92°39'24", in NW$^1/_4$ SW$^1/_4$ sec.25, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080105, on left bank downstream from bridge on U.S. Highway 63, 0.3 mi downstream from Painter Creek, 4.0 mi north of Oskaloosa, 52.0 mi upstream from confluence with North Skunk River, and at mile 147.3 upstream from mouth of Skunk River.

DRAINAGE AREA.--1,635 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as "Skunk River near Oskaloosa." Prior to October 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WDR IA-95-1: Location.

GAGE.--Water-stage recorder. Datum of gage is 685.50 ft above NGVD of 1929. Prior to Nov. 21, 1947, nonrecording gage at site 400 ft downstream at same datum. Gage was moved to the left bank on downstream side of the Highway 63 bridge on May 3, 1995. Accubar pressure sensor installed at site on May 3, 1995.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 25.8 ft, from floodmarks, discharge, 37,000 ft^3/s, from rating curve extended above 18,000 ft^3/s on basis of velocity-area study.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104	276	e169	e150	e73	e123	211	3,990	805	1,660	504	109
2	463	290	e165	e140	e87	e121	211	3,780	751	1,410	490	109
3	866	300	e156	e123	e105	e122	200	2,990	777	1,250	425	104
4	423	294	e150	e114	e88	e120	194	2,420	789	1,100	390	97
5	337	291	e147	e106	e77	e120	187	4,720	725	982	363	90
6	329	295	e142	e100	e71	e121	185	5,730	755	1,510	343	88
7	447	292	e149	e97	e67	e108	202	5,430	1,070	2,270	328	98
8	471	283	e144	e122	e62	e95	206	5,160	1,140	2,410	307	105
9	409	277	e139	e152	e56	e88	203	6,420	1,330	2,910	285	93
10	358	268	e145	e115	e56	e93	207	e7,810	1,570	4,980	262	89
11	320	254	e141	e120	e51	e95	208	e6,740	1,530	6,480	263	89
12	300	241	e159	e116	e57	e411	207	e4,600	1,380	5,570	239	145
13	276	241	e154	e112	e59	e719	230	3,430	1,300	4,090	227	335
14	256	243	e171	e107	e47	e1,360	275	3,050	1,240	3,040	216	229
15	249	233	e177	e86	e44	e2,110	275	3,630	1,140	2,400	209	150
16	239	230	e169	e85	e41	e2,670	256	3,630	1,050	1,980	202	112
17	231	225	e175	e88	e41	e1,840	254	3,020	1,020	1,680	187	97
18	229	226	e187	e81	e44	e1,260	250	2,540	990	1,460	177	88
19	230	225	e160	e78	e109	563	267	2,210	942	1,310	168	91
20	219	225	e140	e76	e201	471	371	1,970	890	1,190	166	106
21	213	224	e137	e73	e238	415	468	1,740	802	1,090	163	97
22	209	213	e122	e78	e222	362	830	1,560	734	991	156	104
23	204	212	e109	e61	e198	307	885	1,450	678	892	145	118
24	207	211	e133	e52	e167	278	751	1,350	630	804	133	111
25	233	203	e143	e48	e138	252	723	1,260	1,430	737	127	102
26	289	188	e159	e51	e118	232	661	1,180	3,080	670	122	89
27	274	e128	e155	e42	e121	223	590	1,080	2,200	646	120	89
28	256	e156	e161	e50	e125	223	555	1,030	2,310	703	119	87
29	266	e170	e164	e55	---	208	538	963	2,310	763	128	86
30	282	e162	e171	e58	---	205	586	923	2,020	610	112	84
31	275	---	e164	e63	---	200	---	900	---	542	108	---
TOTAL	9,464	7,076	4,757	2,799	2,763	15,515	11,186	96,706	37,388	58,130	7,184	3,391
MEAN	305	236	153	90.3	98.7	500	373	3,120	1,246	1,875	232	113
MAX	866	300	187	152	238	2,670	885	7,810	3,080	6,480	504	335
MIN	104	128	109	42	41	88	185	900	630	542	108	84
AC-FT	18,770	14,040	9,440	5,550	5,480	30,770	22,190	191,800	74,160	115,300	14,250	6,730
CFSM	0.19	0.14	0.09	0.06	0.06	0.31	0.23	1.91	0.76	1.15	0.14	0.07
IN.	0.22	0.16	0.11	0.06	0.06	0.35	0.25	2.20	0.85	1.32	0.16	0.08

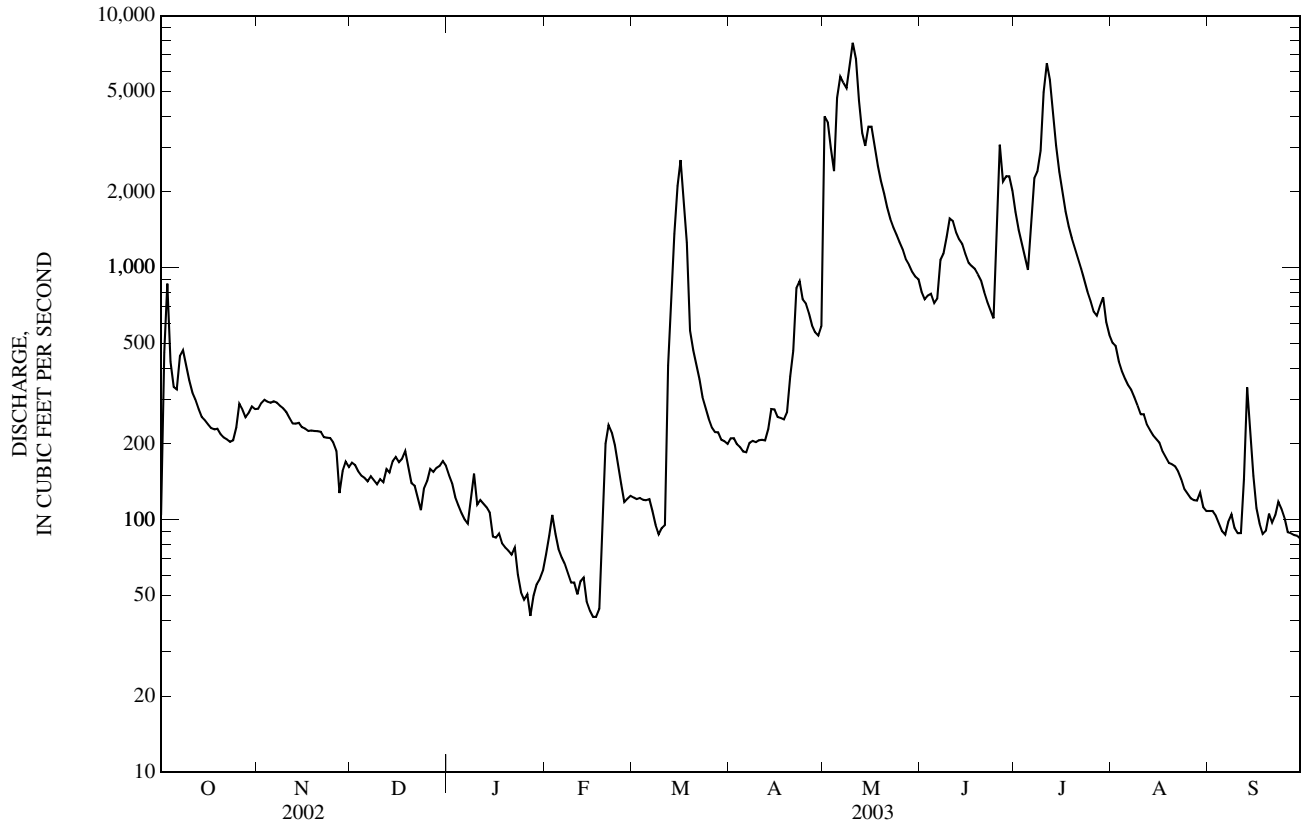
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 2003, BY WATER YEAR (WY)

MEAN	489	535	441	444	797	1,587	1,604	1,737	2,145	1,412	645	459
MAX	3,646	3,576	2,322	3,906	3,587	4,841	5,366	6,168	9,222	11,770	7,772	5,140
(WY)	(1987)	(1984)	(1983)	(1973)	(1973)	(1979)	(1983)	(1974)	(1947)	(1993)	(1993)	(1993)
MIN	8.47	14.5	7.55	5.30	42.9	45.9	42.1	74.2	39.4	27.3	43.3	27.8
(WY)	(1957)	(1957)	(1956)	(1956)	(1954)	(1954)	(1956)	(1956)	(1977)	(1977)	(1988)	(1956)

05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1946 - 2003	
ANNUAL TOTAL	192,238		256,359			
ANNUAL MEAN	527		702		1,025	
HIGHEST ANNUAL MEAN					3,884	1993
LOWEST ANNUAL MEAN					40.1	1956
HIGHEST DAILY MEAN	4,450	Jun 13	7,810	May 10	20,400	Jul 15, 1993
LOWEST DAILY MEAN	88	Sep 18	41	Feb 16a	1.8	Oct 11, 1956
ANNUAL SEVEN-DAY MINIMUM	96	Sep 12	48	Feb 12	2.0	Oct 7, 1956
MAXIMUM PEAK FLOW			7,890	May 10	20,700	Jul 15, 1993
MAXIMUM PEAK STAGE			18.87	May 10	24.78	Jul 15, 1993
ANNUAL RUNOFF (AC-FT)	381,300		508,500		742,300	
ANNUAL RUNOFF (CFSM)	0.32		0.43		0.63	
ANNUAL RUNOFF (INCHES)	4.37		5.83		8.51	
10 PERCENT EXCEEDS	1,260		1,970		2,550	
50 PERCENT EXCEEDS	295		226		438	
90 PERCENT EXCEEDS	150		88		57	

a Also Feb. 17; Ice affected.
e Estimated.



05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA

LOCATION.--Lat 41°18'03", long 92°12'16", in NE¼ SE¼ sec.14, T.75 N., R.12 W., Keokuk County, Hydrologic Unit 07080106, on right bank 10 ft downstream from bridge on State Highway 149, 1.2 mi downstream from Cedar Creek, 2.2 mi south of Sigourney, 4.0 mi upstream from Bridge Creek, and 16.2 mi upstream from confluence with South Skunk River.

DRAINAGE AREA.--730 mi^2.

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946-47 (M).

GAGE.--Water stage recorder. Datum of gage is 651.53 ft above NGVD of 1929. Prior to June 10, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 22.8 ft, from floodmark, discharge, 14,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e83	143	e77	64	e41	e26	115	468	302	459	152	42
2	e74	133	e73	67	e44	e26	110	1,720	273	387	148	40
3	1,680	124	e69	55	e48	e28	109	1,110	259	350	145	38
4	1,130	118	e73	56	e44	e28	103	828	270	322	129	36
5	464	115	e70	55	e42	e28	98	871	280	298	118	34
6	330	113	e68	55	e37	e32	96	1,710	281	276	110	32
7	247	112	e70	54	e30	e28	98	1,360	292	305	106	30
8	198	115	e63	63	e28	e32	96	1,430	480	330	98	29
9	166	110	e60	61	e27	e30	99	2,350	535	369	92	27
10	147	108	e63	e45	e27	e42	102	2,760	647	1,490	86	27
11	132	105	e61	e44	e30	e67	107	2,770	690	1,410	82	26
12	122	102	e62	e50	e32	e139	111	2,140	599	841	78	25
13	113	97	e62	e42	e32	e394	110	1,430	529	633	75	33
14	105	95	e68	e42	e35	e1,150	106	1,130	571	494	73	51
15	96	95	e75	e33	e39	e1,410	101	1,050	535	419	70	97
16	95	93	76	e32	e32	e1,280	96	1,060	443	363	69	76
17	93	90	77	e35	e32	e1,060	93	941	373	327	67	57
18	89	88	79	e31	e35	851	91	820	332	430	65	44
19	88	86	80	e31	e37	532	101	736	307	448	61	37
20	89	86	84	e31	e49	411	114	681	291	337	59	31
21	87	87	e79	e30	e95	306	137	627	270	298	63	28
22	83	86	e75	e34	e111	255	185	574	247	276	63	30
23	82	85	e54	e28	e76	213	174	546	234	262	60	34
24	81	83	e59	e26	e53	187	155	526	223	248	54	32
25	86	82	e62	e25	e37	170	152	488	222	237	52	33
26	92	e76	e64	e27	e32	158	162	449	1,110	228	50	32
27	125	e55	e70	e21	e30	144	172	412	1,090	211	48	27
28	131	e62	e64	e25	e28	131	151	388	606	214	45	24
29	114	e70	58	e28	---	136	135	353	512	231	42	22
30	110	e69	60	e34	---	135	282	335	552	201	45	20
31	122	---	60	e38	---	122	---	320	---	163	42	---
TOTAL	6,654	2,883	2,115	1,262	1,183	9,551	3,761	32,383	13,355	12,857	2,447	1,094
MEAN	215	96.1	68.2	40.7	42.2	308	125	1,045	445	415	78.9	36.5
MAX	1,680	143	84	67	111	1,410	282	2,770	1,110	1,490	152	97
MIN	74	55	54	21	27	26	91	320	222	163	42	20
AC-FT	13,200	5,720	4,200	2,500	2,350	18,940	7,460	64,230	26,490	25,500	4,850	2,170
CFSM	0.29	0.13	0.09	0.06	0.06	0.42	0.17	1.43	0.61	0.57	0.11	0.05
IN.	0.34	0.15	0.11	0.06	0.06	0.49	0.19	1.65	0.68	0.66	0.12	0.06

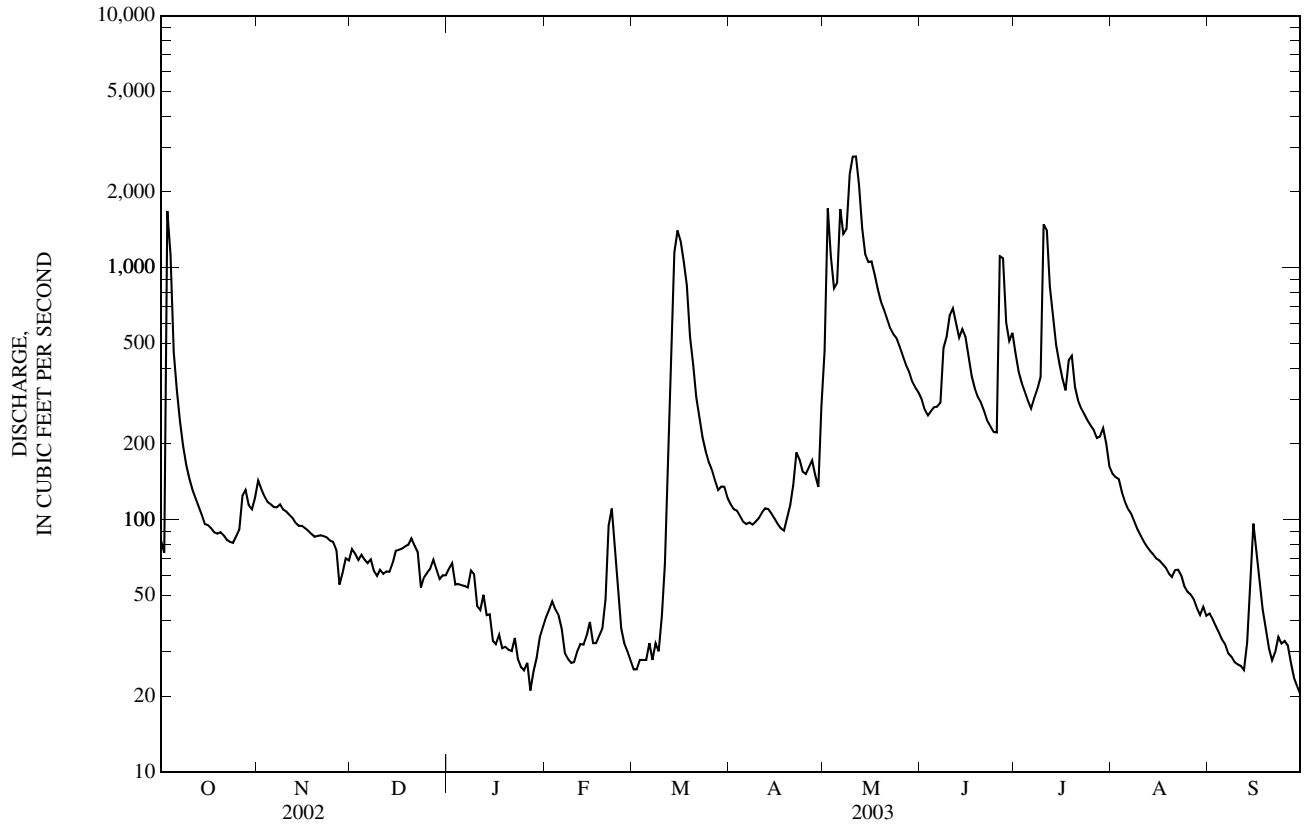
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 2003, BY WATER YEAR (WY)

MEAN	222	281	220	250	414	843	764	834	800	544	283	274
MAX	1,603	1,890	1,208	1,767	1,311	2,996	2,826	4,170	4,145	5,098	3,668	2,708
(WY)	(1987)	(1962)	(1983)	(1946)	(1973)	(1979)	(1993)	(1974)	(1947)	(1993)	(1993)	(1993)
MIN	0.13	3.38	2.58	2.26	12.8	17.0	11.2	14.4	20.1	11.2	7.90	4.35
(WY)	(1957)	(1957)	(1956)	(1954)	(1954)	(1954)	(1956)	(1956)	(1977)	(1977)	(1955)	(1956)

05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1946 - 2003	
ANNUAL TOTAL	82,670		89,545			
ANNUAL MEAN	226		245		477	
HIGHEST ANNUAL MEAN					2,041	1993
LOWEST ANNUAL MEAN					27.7	1956
HIGHEST DAILY MEAN	2,590	May 12	2,770	May 11	23,200	Mar 31, 1960
LOWEST DAILY MEAN	26	Jan 15	20	Sep 30	0.10	Oct 7, 1956
ANNUAL SEVEN-DAY MINIMUM	28	Jan 13	26	Jan 23	0.10	Oct 7, 1956
MAXIMUM PEAK FLOW			2,840	May 11	27,500	Mar 31, 1960
MAXIMUM PEAK STAGE			13.00	May 11	25.33	Mar 31, 1960
INSTANTANEOUS LOW FLOW			19	Sep 30		
ANNUAL RUNOFF (AC-FT)	164,000		177,600		345,800	
ANNUAL RUNOFF (CFSM)	0.31		0.34		0.65	
ANNUAL RUNOFF (INCHES)	4.21		4.56		8.88	
10 PERCENT EXCEEDS	536		602		1,170	
50 PERCENT EXCEEDS	110		95		164	
90 PERCENT EXCEEDS	45		31		19	

e Estimated



05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA

LOCATION.--Lat. 40°55'20", long 91°40'10", in SE¼ NW¼ sec.28, T.71 N., R.7 W., Henry County, Hydrologic Unit 07080107, on left bank 30 ft upstream from bridge on county highway H46, 3.0 mi west of Oakland Mills, 2.9 mi upstream from Wolf Creek, and 4.3 mi upstream from mouth.

DRAINAGE AREA.--530 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1957 to 1977. July 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 565.07 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional high-water measurements were made by U.S. Army Corps of Engineers in 1965, 1966, 1970, and 1974 and by U.S. Geological Survey in 1966 and 1967. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 22, 1973 reached a stage of 24.09 ft, discharge not determined. Flood of June 1905 reached a stage approximately 2 feet higher from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	8.4	e4.9	e5.9	e9.4	e8.7	18	143	15	36	7.5	11
2	7.0	8.2	e4.5	e5.8	e9.9	e7.3	17	241	15	28	6.4	8.6
3	7.4	7.8	e4.0	e5.8	e9.1	e5.9	16	152	14	23	5.7	10
4	25	6.9	e5.5	e5.3	e8.3	e5.0	18	87	13	20	5.7	8.1
5	22	6.2	e4.0	e5.7	e8.1	e5.3	19	369	14	17	5.4	4.3
6	17	5.6	e3.2	e6.9	e7.2	e4.5	20	228	18	16	4.9	3.0
7	12	5.5	e4.8	e8.4	e5.4	e4.5	27	164	33	24	4.2	2.4
8	8.4	5.1	e3.5	e10	e5.9	e5.3	37	89	49	29	3.8	1.9
9	6.3	4.9	e3.0	e9.1	e5.5	e4.2	45	407	28	85	3.7	1.7
10	5.3	5.3	e4.1	e7.0	e5.7	e4.2	34	468	34	735	3.1	1.7
11	5.3	5.1	e2.9	10	e5.2	e29	29	1,260	44	281	3.3	0.98
12	5.0	5.0	e5.1	10	e5.2	e114	26	743	38	98	4.6	0.87
13	4.8	4.9	e4.6	9.6	e5.2	e376	22	243	29	61	3.4	8.1
14	4.4	4.7	e6.2	e8.7	e5.6	e524	20	134	27	37	3.2	31
15	4.6	4.9	e7.2	e7.0	e8.0	e392	18	95	22	30	3.7	61
16	4.8	5.0	e6.7	e6.8	e6.8	e307	18	74	21	22	2.9	37
17	4.7	4.7	e7.4	e7.0	e7.0	e263	18	58	19	18	3.0	17
18	4.6	5.2	e12	e7.7	e8.8	e195	17	47	18	145	2.8	9.9
19	4.6	5.6	e20	e7.7	e11	126	20	44	17	79	2.2	8.7
20	4.4	5.5	e14	e7.7	e23	93	34	61	14	44	2.2	6.8
21	4.1	5.5	e12	e6.8	e51	76	127	42	12	27	2.3	6.0
22	3.9	5.5	e8.1	e8.5	e87	57	105	32	11	20	2.3	10
23	3.8	5.6	e4.5	e4.9	e103	45	63	28	8.9	15	2.0	7.9
24	4.6	4.7	e6.0	e5.6	e37	38	47	24	7.0	12	1.8	6.8
25	6.7	5.8	e7.2	e6.6	e39	31	61	22	515	9.7	1.2	7.3
26	8.1	6.0	e7.7	e6.1	e47	28	114	20	1,160	8.4	2.0	5.3
27	19	e3.2	e5.3	e5.3	e27	25	94	19	492	8.0	1.6	5.5
28	12	e4.1	e6.5	e5.8	e13	23	62	18	149	10	5.0	4.0
29	9.1	e4.8	e7.9	e6.9	---	22	45	16	82	10	15	3.4
30	10	e3.7	e8.0	e7.6	---	21	39	17	52	8.8	9.5	2.7
31	10	---	e6.9	e8.5	---	20	---	16	---	9.8	6.6	---
TOTAL	253.6	163.4	207.7	224.7	564.3	2,859.9	1,230	5,361	2,970.9	1,966.7	131.0	292.95
MEAN	8.18	5.45	6.70	7.25	20.2	92.3	41.0	173	99.0	63.4	4.23	9.77
MAX	25	8.4	20	10	103	524	127	1,260	1,160	735	15	61
MIN	3.8	3.2	2.9	4.9	5.2	4.2	16	16	7.0	8.0	1.2	0.87
AC-FT	503	324	412	446	1,120	5,670	2,440	10,630	5,890	3,900	260	581
CFSM	0.02	0.01	0.01	0.01	0.04	0.17	0.08	0.32	0.19	0.12	0.01	0.02
IN.	0.02	0.01	0.01	0.02	0.04	0.20	0.09	0.37	0.21	0.14	0.01	0.02

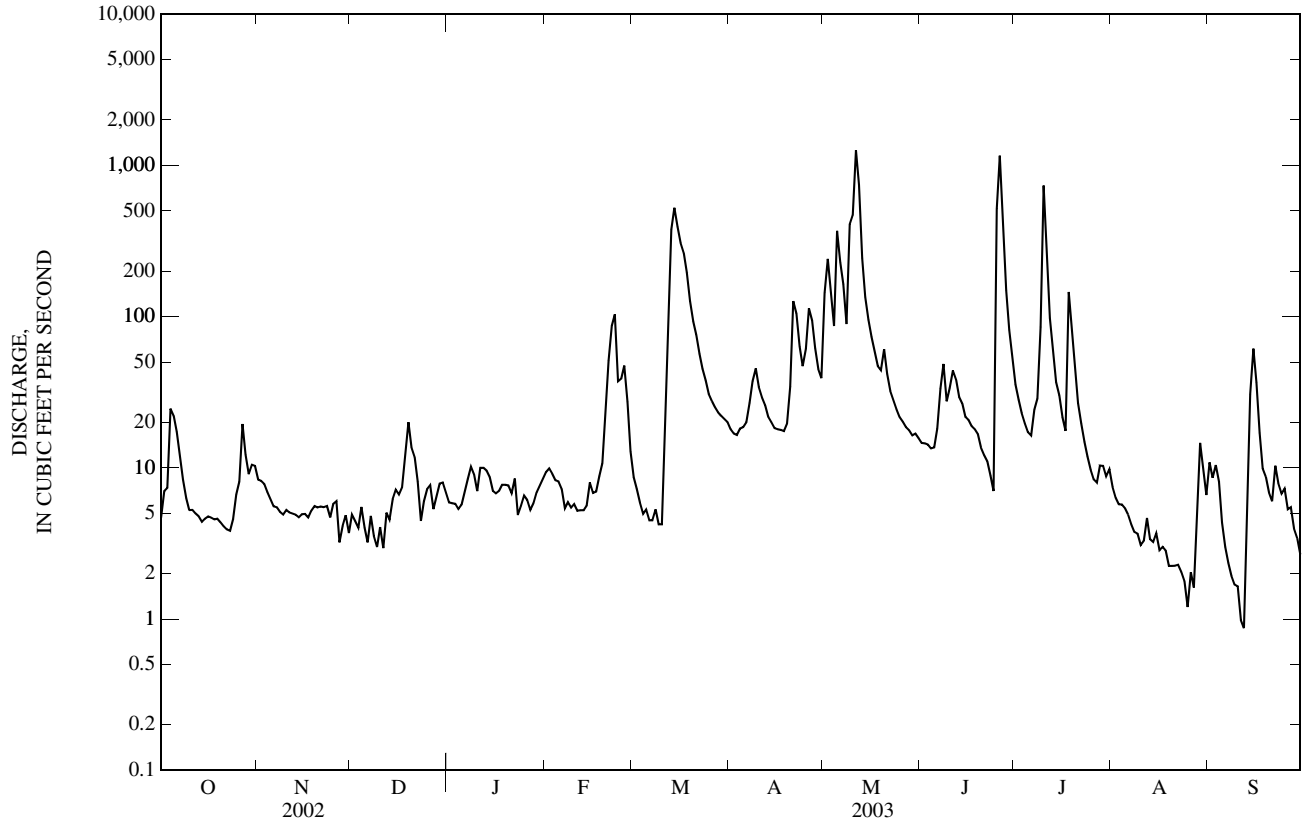
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	228	275	216	97.1	328	598	609	748	607	534	176	206
MAX	1,711	1,340	1,364	545	1,091	1,987	1,863	3,116	2,199	4,565	2,186	1,245
(WY)	(1987)	(1993)	(1983)	(1993)	(1985)	(1979)	(1983)	(1996)	(1990)	(1993)	(1993)	(1986)
MIN	5.93	5.45	4.43	7.25	6.36	25.6	34.3	21.6	14.6	3.52	4.23	4.63
(WY)	(1989)	(2003)	(1990)	(2003)	(1989)	(2000)	(2000)	(2000)	(1988)	(1988)	(2003)	(2002)

05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1978 - 2003	
ANNUAL TOTAL	106,358.5		16,226.15			
ANNUAL MEAN	291		44.5		385	
HIGHEST ANNUAL MEAN					1,424	1993
LOWEST ANNUAL MEAN					44.5	2003
HIGHEST DAILY MEAN	6,500	Jun 13	1,260	May 11	11,500	May 28, 1996
LOWEST DAILY MEAN	2.9	Dec 11	0.87	Sep 12	0.42	Sep 17, 1988
ANNUAL SEVEN-DAY MINIMUM	3.6	Dec 5	1.8	Sep 6	0.55	Sep 14, 1988
MAXIMUM PEAK FLOW			1,970	Jun 25	12,300	May 28, 1996
MAXIMUM PEAK STAGE			9.85	Jun 25	21.27	Jul 9, 1993
INSTANTANEOUS LOW FLOW			0.75	Sep 11a		
ANNUAL RUNOFF (AC-FT)	211,000		32,180		279,000	
ANNUAL RUNOFF (CFSM)	0.55		0.083		0.72	
ANNUAL RUNOFF (INCHES)	7.42		1.13		9.82	
10 PERCENT EXCEEDS	617		88		884	
50 PERCENT EXCEEDS	22		8.7		74	
90 PERCENT EXCEEDS	4.6		4.0		7.3	

a Also Sept. 12.
e Estimated.



05473450 BIG CREEK NEAR MT. PLEASANT, IA

LOCATION.--Lat. 45°00'26", long 91°33'05", in NW¼ SE¼ sec.28, T.72 N., R.6 W., Henry County, Hydrologic Unit 07080107, on right bank 20 ft upstream from bridge on old U.S. highway 218 (Mt. Pleasant business route) about 2 miles north of Mt. Pleasant, 1.6 miles upstream from Brandy Wine Creek, and 2.3 miles upstream from Lynn Creek.

DRAINAGE AREA.--58 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1957 to 1977. Oct. 1, 1997 to current year.

GAGE.--Water-stage recorder. Datum of gage is 643.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 21, 1973, discharge 9,580 ft^3/s, on basis of contracted-opening measurement.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.18	e1.1	e0.74	e0.38	e1.4	e1.7	1.7	e160	8.9	12	0.61	0.65
2	2.0	e0.96	e0.64	e0.37	e1.0	e1.6	1.7	119	8.0	11	0.53	0.25
3	e2.5	e0.65	e0.55	e0.35	e0.90	e1.7	1.7	71	9.5	10	e0.55	0.14
4	2.8	e0.40	e0.83	e0.30	e0.90	e1.4	2.3	71	9.3	8.6	e0.70	0.10
5	1.00	e0.35	e0.72	e0.33	e0.80	e1.6	2.0	370	8.7	6.0	0.56	0.10
6	0.40	e0.31	e0.64	e0.47	e0.67	e0.98	1.8	151	14	4.7	0.55	0.11
7	0.31	0.36	e0.85	e0.46	e0.65	e1.4	4.7	94	44	3.9	0.43	0.13
8	0.30	0.32	e0.76	e0.50	e0.57	e0.98	4.4	78	43	20	0.31	0.13
9	0.29	0.38	e0.64	e0.50	e0.55	e0.77	4.2	271	31	57	e0.22	0.13
10	0.28	0.42	e0.80	e0.46	e0.68	e1.9	3.3	280	31	180	e0.20	0.13
11	0.23	0.43	e0.72	e0.42	e0.75	e3.6	2.9	209	34	67	0.19	0.12
12	0.22	0.44	e0.87	e0.38	e0.96	e7.3	2.7	110	27	31	0.21	0.14
13	0.22	0.43	e0.76	e0.39	e0.96	e13	2.6	77	23	18	0.12	5.7
14	0.28	0.48	e1.1	e0.38	e1.5	e21	2.3	62	18	12	0.11	9.4
15	0.35	0.54	e1.3	e0.36	e1.4	e26	2.1	49	14	11	0.11	2.7
16	0.35	0.54	e0.92	e0.38	e2.1	e23	2.0	38	12	7.4	0.10	e0.68
17	0.32	0.59	e1.4	e0.24	e1.6	e20	2.4	32	11	4.9	0.08	0.25
18	0.33	0.68	e2.1	e0.28	e2.0	e17	2.0	27	11	27	0.08	0.20
19	0.35	0.90	e3.2	e0.43	e2.7	12	3.3	30	11	14	0.05	0.44
20	0.32	0.88	e2.6	e0.65	e9.5	9.2	20	61	7.7	6.1	0.03	0.21
21	0.32	1.0	e2.1	e0.53	e20	6.8	26	53	6.8	4.4	0.02	0.13
22	0.31	0.90	e1.5	e0.52	e23	4.5	14	41	6.6	3.0	0.01	0.34
23	0.29	0.84	e0.25	e0.80	e15	3.2	8.8	33	6.3	2.2	0.00	0.39
24	0.45	0.80	e0.35	e0.92	e12	2.7	8.3	28	5.6	1.8	0.00	0.20
25	1.3	0.80	e0.46	e0.93	e3.3	2.5	11	24	67	1.5	0.00	0.14
26	0.74	e0.72	e0.45	e0.63	e1.9	2.2	9.2	19	91	1.3	0.11	0.14
27	0.44	e0.57	e0.25	e0.48	e1.7	2.1	7.8	16	43	1.1	0.19	0.18
28	0.49	e0.60	e0.37	e0.45	e1.1	2.2	7.0	16	27	1.2	0.16	0.19
29	0.64	e0.81	e0.44	e0.64	---	2.2	6.6	15	19	1.0	0.46	0.14
30	e2.0	e0.64	e0.47	e0.73	---	2.0	e5.4	14	14	0.84	0.18	0.11
31	e1.9	---	e0.43	e0.93	---	1.8	---	13	---	0.71	0.21	---
TOTAL	21.91	18.84	29.21	15.59	109.59	198.33	174.2	2,632	662.4	530.65	7.08	23.67
MEAN	0.71	0.63	0.94	0.50	3.91	6.40	5.81	84.9	22.1	17.1	0.23	0.79
MAX	2.8	1.1	3.2	0.93	23	26	26	370	91	180	0.70	9.4
MIN	0.18	0.31	0.25	0.24	0.55	0.77	1.7	13	5.6	0.71	0.00	0.10
AC-FT	43	37	58	31	217	393	346	5,220	1,310	1,050	14	47
CFSM	0.01	0.01	0.02	0.01	0.07	0.11	0.10	1.46	0.38	0.30	0.00	0.01
IN.	0.01	0.01	0.02	0.01	0.07	0.13	0.11	1.69	0.42	0.34	0.00	0.02

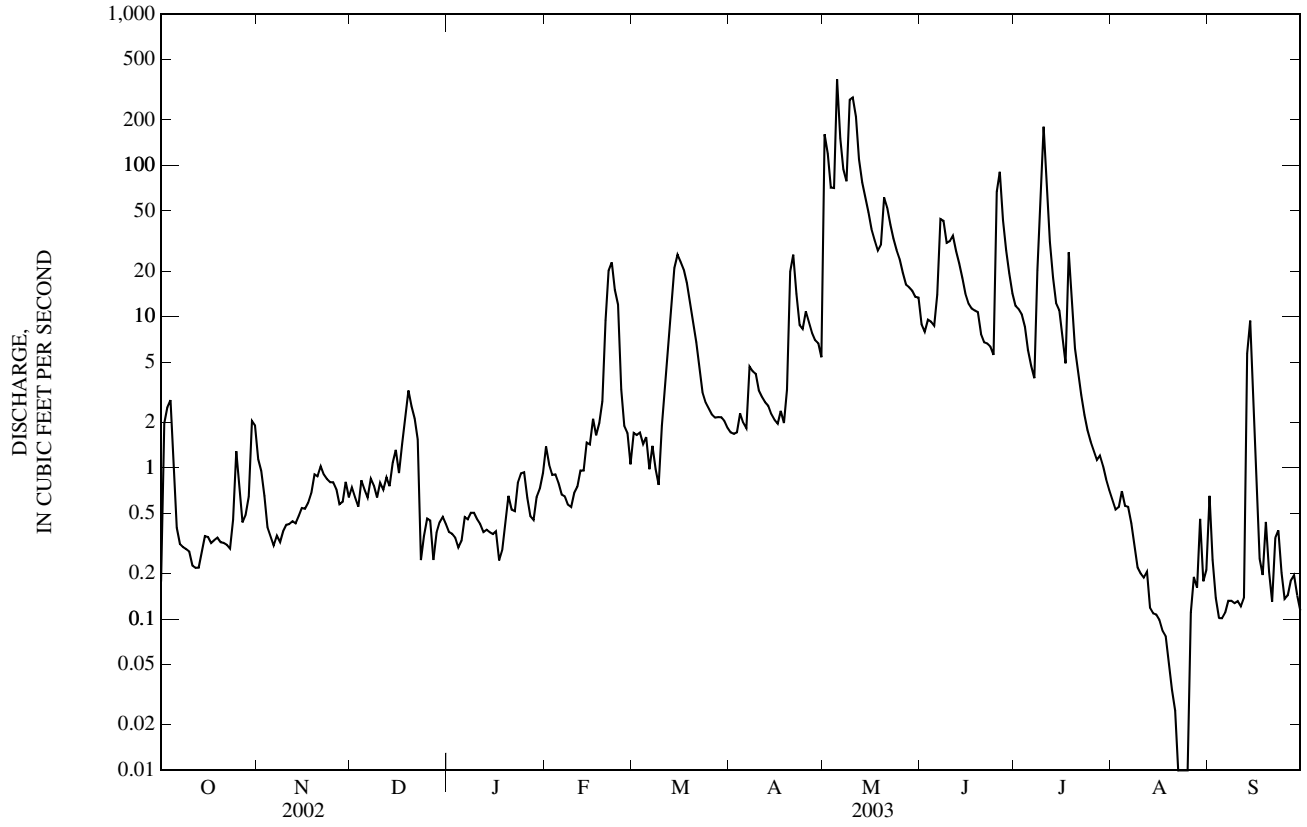
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2003, BY WATER YEAR (WY)

MEAN	23.1	16.8	8.04	20.3	74.1	64.9	83.5	98.1	84.3	16.6	2.92	2.44
MAX	110	78.6	25.6	83.0	215	176	201	221	141	49.1	8.61	8.41
(WY)	(1999)	(1999)	(1999)	(1998)	(2001)	(1998)	(1998)	(2001)	(2002)	(2000)	(1998)	(1998)
MIN	0.56	0.63	0.68	0.50	3.91	6.40	5.81	26.2	22.1	2.67	0.23	0.13
(WY)	(2000)	(2003)	(2000)	(2003)	(2003)	(2003)	(2003)	(2000)	(2003)	(1999)	(2003)	(2002)

05473450 BIG CREEK NEAR MT. PLEASANT, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1997 - 2003	
ANNUAL TOTAL	11,724.40		4,423.47			
ANNUAL MEAN	32.1		12.1		40.9	
HIGHEST ANNUAL MEAN					68.1	1998
LOWEST ANNUAL MEAN					12.1	2003
HIGHEST DAILY MEAN	1,360	Jun 1	370	May 5	1,600	Mar 31, 1998
LOWEST DAILY MEAN	0.02	Sep 18	0.00	Aug 23a	0.00	Aug 23, 2003a
ANNUAL SEVEN-DAY MINIMUM	0.04	Sep 13	0.02	Aug 19	0.02	Aug 19, 2003
MAXIMUM PEAK FLOW			454	May 5	2,450	Jun 1, 2002
MAXIMUM PEAK STAGE			6.44	May 5	14.29	Feb 9, 2001
INSTANTANEOUS LOW FLOW			0.00	Aug 22	0.00	Aug 22, 2003
ANNUAL RUNOFF (AC-FT)	23,260		8,770		29,660	
ANNUAL RUNOFF (CFSM)	0.55		0.21		0.71	
ANNUAL RUNOFF (INCHES)	7.52		2.84		9.59	
10 PERCENT EXCEEDS	69		27		96	
50 PERCENT EXCEEDS	2.6		1.0		7.6	
90 PERCENT EXCEEDS	0.25		0.20		0.44	

a Also Aug. 24, 25.
e Estimated



05474000 SKUNK RIVER AT AUGUSTA, IA

LOCATION.--Lat 40°45'13", long 91°16'40", in NE¼ NE¼ sec.26, T.69 N., R.4 W., Des Moines County, Hydrologic Unit 07080107, on left bank 300 ft upstream from bridge on State Highway 394 at Augusta, 2.0 mi upstream from Long Creek, and at mile 12.5.

DRAINAGE AREA.--4,303 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September to November 1913, October 1914 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1915 (M), 1919-27 (M), 1932-34 (M), 1936, 1937-38 (M), 1942 (M). WSP 1438: Drainage area. WDR IA-71-1: 1966 (M).

GAGE.--Water-stage recorder. Datum of gage is 521.24 ft above NGVD of 1929. Prior to Nov. 15, 1913, nonrecording gage at site 400 ft upstream at datum about 0.7 ft higher. May 27, 1915 to Jan. 14, 1935, nonrecording gage at site 400 ft upstream at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1903, reached a stage of about 21 ft, discharge, about 45,000 ft^3/s. Stage and discharge for flood of April 1973 are believed to be the greatest since 1851.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	286	493	207	285	116	523	474	1,810	1,740	3,280	1,010	307
2	318	469	e177	229	123	388	479	3,210	1,660	3,150	943	298
3	356	479	e164	211	129	299	461	4,500	1,600	2,740	891	271
4	366	497	e167	223	98	257	466	5,580	1,480	2,380	804	244
5	1,430	492	e159	322	86	163	472	6,330	1,420	2,130	790	234
6	2,100	494	204	325	87	186	446	5,000	1,470	1,950	718	217
7	1,260	489	268	346	79	184	487	5,360	1,560	1,770	682	202
8	953	486	267	267	76	156	538	6,060	1,550	1,890	839	191
9	803	484	227	288	81	127	534	7,500	1,630	2,800	420	181
10	752	484	237	230	85	117	521	8,290	1,970	3,740	595	169
11	783	477	238	253	79	117	483	11,000	2,240	5,260	575	158
12	732	457	302	181	69	244	512	10,400	2,540	5,420	550	169
13	657	441	307	168	65	977	503	8,990	2,710	5,330	520	214
14	587	431	290	192	52	2,940	507	7,950	2,460	5,090	495	566
15	546	418	256	e170	50	3,520	512	7,470	2,320	5,100	477	548
16	511	397	270	e149	47	3,750	523	6,840	2,210	4,900	446	462
17	474	378	295	e147	51	4,990	562	5,920	2,030	4,000	423	516
18	452	372	430	e144	55	3,610	575	5,490	1,810	3,610	399	448
19	438	358	701	e138	60	3,060	571	5,100	1,660	3,760	378	430
20	417	346	507	e130	81	2,330	741	4,660	1,540	2,810	366	342
21	400	342	461	e126	167	1,620	800	4,250	1,420	2,410	372	275
22	392	337	476	e118	659	1,270	903	4,010	1,340	2,020	379	271
23	386	333	e355	e109	1,280	1,050	884	3,670	1,280	1,780	384	239
24	386	334	e209	e110	1,060	910	935	3,420	1,190	1,590	406	210
25	412	330	e190	e107	779	798	1,330	3,250	1,200	1,440	420	202
26	445	324	e177	e104	730	705	1,390	3,090	5,050	1,300	400	199
27	434	310	246	e101	877	638	1,310	2,800	3,520	1,180	302	207
28	437	289	285	109	688	564	1,210	2,480	4,780	1,100	277	204
29	441	262	316	105	---	570	1,140	2,230	4,030	1,010	313	195
30	502	269	353	103	---	520	1,070	2,020	3,470	933	295	180
31	526	---	348	105	---	494	---	1,860	---	948	288	---
TOTAL	18,982	12,072	9,089	5,595	7,809	37,077	21,339	160,540	64,880	86,821	16,157	8,349
MEAN	612	402	293	180	279	1,196	711	5,179	2,163	2,801	521	278
MAX	2,100	497	701	346	1,280	4,990	1,390	11,000	5,050	5,420	1,010	566
MIN	286	262	159	101	47	117	446	1,810	1,190	933	277	158
AC-FT	37,650	23,940	18,030	11,100	15,490	73,540	42,330	318,400	128,700	172,200	32,050	16,560
CFSM	0.14	0.09	0.07	0.04	0.06	0.28	0.16	1.20	0.50	0.65	0.12	0.06
IN.	0.16	0.10	0.08	0.05	0.07	0.32	0.18	1.38	0.56	0.75	0.14	0.07

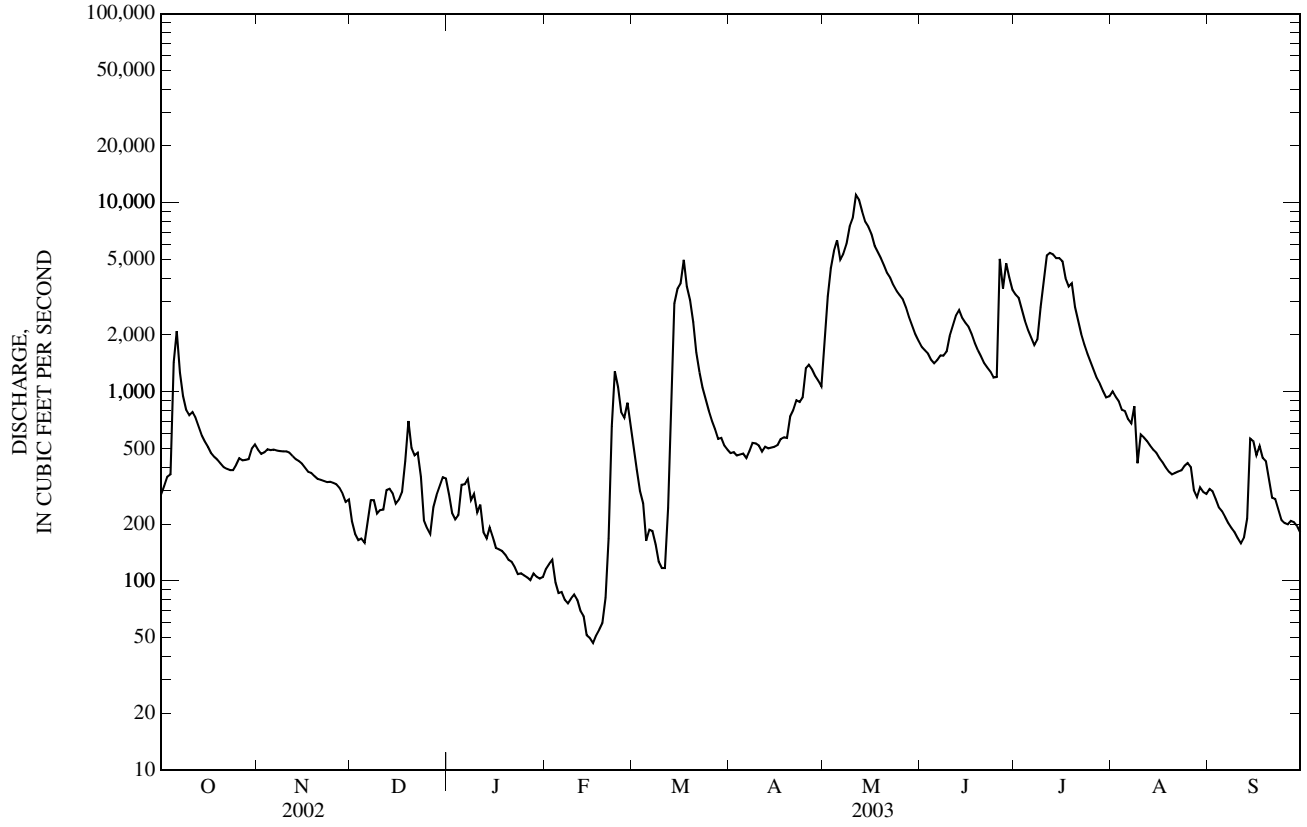
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1915 - 2003, BY WATER YEAR (WY)

MEAN	1,357	1,525	1,251	1,278	2,338	4,310	4,117	4,178	4,394	2,837	1,651	1,577
MAX	11,560	10,020	8,387	8,090	7,306	16,560	18,770	16,780	19,800	26,860	18,550	15,460
(WY)	(1987)	(1962)	(1983)	(1946)	(1984)	(1979)	(1973)	(1996)	(1947)	(1993)	(1993)	(1926)
MIN	15.5	20.5	21.2	21.3	56.5	191	104	92.5	130	122	25.8	71.4
(WY)	(1957)	(1957)	(1957)	(1940)	(1940)	(1957)	(1956)	(1934)	(1977)	(1988)	(1934)	(1953)

05474000 SKUNK RIVER AT AUGUSTA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1915 - 2003	
ANNUAL TOTAL	652,097		448,710			
ANNUAL MEAN	1,787		1,229		2,566	
HIGHEST ANNUAL MEAN					10,200	1993
LOWEST ANNUAL MEAN					152	1934
HIGHEST DAILY MEAN	20,200	May 13	11,000	May 11	62,600	Apr 23, 1973
LOWEST DAILY MEAN	159	Dec 5	47	Feb 16	7.0	Aug 27, 1934
ANNUAL SEVEN-DAY MINIMUM	192	Dec 1	54	Feb 13	7.4	Aug 26, 1934
MAXIMUM PEAK FLOW			11,800	May 11	66,800	Apr 23, 1973
MAXIMUM PEAK STAGE			10.91	May 11	27.05	Apr 23, 1973
INSTANTANEOUS LOW FLOW			38	Feb 16	7.0	Aug 7, 1934
ANNUAL RUNOFF (AC-FT)	1,293,000		890,000		1,859,000	
ANNUAL RUNOFF (CFSM)	0.41		0.29		0.60	
ANNUAL RUNOFF (INCHES)	5.63		3.87		8.08	
10 PERCENT EXCEEDS	4,390		3,610		6,770	
50 PERCENT EXCEEDS	732		483		1,050	
90 PERCENT EXCEEDS	287		142		150	

e Estimated



05474000 SKUNK RIVER AT AUGUSTA, IA—Continued

WATER QUALITY RECORDS

LOCATION.--Samples collected at bridge on State Highway 394, 300 ft downstream from gage.

PERIOD OF RECORD.--October 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to current year.
WATER TEMPERATURES: October 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1975 to current year.

REMARKS.--During periods of ice effect, sediment samples are collected in open water channel. Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens Dec. 20, 1979, Feb. 12, 1980; minimum daily, 149 microsiemens Mar. 6, 1993.
WATER TEMPERATURES: Maximum daily, 34.0°C July 20, 1980, Aug. 15-17, 1988, July 10-13, 1989, and July 15, 1995, and July 30, 1999; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,550 mg/L June 25, 1981; minimum daily mean, 1 mg/L Mar. 8, 9, 12, 1978, Jan. 5, 6, 1984.
SEDIMENT LOADS: Maximum daily, 499,000 tons Mar. 21, 1978; minimum daily, 0.93 tons Feb. 11, 2003.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 770 microsiemens Dec. 26; minimum daily, 213 microsiemens Jan. 18.
WATER TEMPERATURES: Maximum daily, 33.0°C Aug. 21, 27; minimum daily, 0.0°C many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,790 mg/L June 26; minimum daily mean, 4.0 mg/L Feb. 11, Mar. 8.
SEDIMENT LOADS: Maximum daily, 61,400 tons May 11; minimum daily, 0.93 tons Feb. 11.

EXTREMES FOR CURRENT YEAR.--

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Temperature, water, deg C (00010)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
NOV						
19...	1145	362	--	100	4	3.9
JAN						
14...	1220	191	--	100	5	2.6
FEB						
25...	1215	801	--	92	46	99
APR						
15...	0940	511	--	98	40	55
MAY						
28...	1110	2,440	20.0	99	222	1,460
JUL						
08...	1025	1,670	30.0	99	190	857
AUG						
19...	0950	375	25.0	99	64	65
SEP						
30...	1140	183	12.4	100	27	13

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Bed sediment, dry svd sve dia percent <.063mm (80164)	Bed sediment, dry svd sve dia percent <.125mm (80165)	Bed sediment, dry svd sve dia percent <.25mm (80166)	Bed sediment, dry svd sve dia percent <.5 mm (80167)	Bed sediment, dry svd sve dia percent <1 mm (80168)	Bed sediment, dry svd sve dia percent <2 mm (80169)	Bed sediment, dry svd sve dia percent <4 mm (80170)	Bed sediment, dry svd sve dia percent <8 mm (80171)	Number of sampling points, count (00063)
MAY										
28...	1150	3	3	5	43	88	96	97	100	3
JUL										
08...	1025	0.0	1	12	73	92	98	100	--	3

05474000 SKUNK RIVER AT AUGUSTA, IA—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	393	639	651	630	694	455	525	551	550	515	578	528
2	443	646	594	585	634	463	488	461	551	583	551	617
3	472	634	656	593	623	516	503	435	565	606	585	589
4	543	618	667	600	---	520	518	415	551	612	529	578
5	499	628	627	635	630	513	526	448	545	632	480	603
6	372	634	685	628	643	508	557	545	547	638	455	608
7	332	623	619	589	655	508	532	548	622	651	411	609
8	370	629	633	645	681	519	563	446	611	602	429	600
9	379	652	609	641	728	535	550	515	425	606	398	618
10	413	642	644	629	695	585	541	501	556	557	396	621
11	461	583	624	636	677	613	516	425	---	490	388	627
12	499	593	607	634	690	555	507	357	588	413	401	631
13	576	613	610	674	705	426	513	423	597	443	405	585
14	597	612	656	648	678	379	506	489	570	474	415	570
15	624	576	613	586	617	355	494	547	606	564	418	548
16	596	616	604	603	645	326	509	591	610	584	412	555
17	625	567	608	626	719	323	500	603	621	564	422	551
18	579	574	596	213	691	311	516	602	618	581	419	576
19	613	587	559	649	626	304	532	604	617	534	424	495
20	574	575	649	630	723	320	529	632	606	534	432	612
21	660	639	631	629	690	347	580	620	639	618	448	578
22	545	589	666	736	621	395	576	621	639	594	450	501
23	617	663	646	645	656	408	579	628	583	623	469	498
24	599	640	658	673	475	431	559	617	582	---	475	518
25	585	653	737	654	462	449	551	649	567	540	495	523
26	538	646	770	674	502	481	556	573	255	546	503	513
27	635	591	685	651	450	482	600	565	368	580	521	528
28	613	640	663	685	484	496	648	565	556	530	541	536
29	543	648	638	623	---	510	652	564	370	528	534	568
30	603	605	628	713	---	530	637	511	451	543	565	588
31	574	---	618	644	---	544	---	595	---	547	532	---

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	5.0	0.0	1.0	4.0	0.0	17.0	15.0	---	---	28.0	20.0
2	24.0	5.0	0.0	0.0	2.0	0.0	19.0	12.0	---	---	29.0	25.0
3	21.0	4.0	0.0	1.0	2.0	1.0	16.0	17.0	---	---	27.0	27.0
4	21.0	4.0	0.0	1.0	---	1.0	11.0	13.0	---	---	29.0	25.0
5	20.0	5.0	4.0	0.0	4.0	0.0	7.0	15.0	---	---	28.0	26.0
6	18.0	6.0	1.0	1.0	3.0	1.0	5.0	16.0	---	---	30.0	27.0
7	16.0	8.0	2.0	3.0	0.0	1.0	5.0	15.0	---	---	30.0	28.0
8	17.0	10.0	0.0	8.0	0.0	1.0	5.0	13.0	18.0	28.0	30.0	28.0
9	18.0	11.0	2.0	2.0	0.0	1.0	10.0	15.0	22.0	28.0	28.0	26.0
10	19.0	10.0	3.0	0.0	0.0	0.0	13.0	17.0	22.0	22.0	28.0	26.0
11	18.0	6.0	2.0	0.0	1.0	2.0	15.0	14.0	---	25.0	29.0	27.0
12	17.0	8.0	2.0	0.0	3.0	3.0	12.0	16.0	24.0	25.0	26.0	25.0
13	15.0	8.0	2.0	1.0	2.0	3.0	15.0	16.0	24.0	26.0	28.0	22.0
14	---	6.0	3.0	0.0	0.0	3.0	20.0	17.0	26.0	26.0	29.0	21.0
15	---	6.0	2.0	0.0	0.0	5.0	22.0	---	23.0	27.0	30.0	23.0
16	---	5.0	0.0	0.0	3.0	5.0	19.0	---	26.0	27.0	27.0	24.0
17	---	5.0	1.0	0.0	0.0	7.0	13.0	---	27.0	27.0	28.0	23.0
18	---	6.0	8.0	0.0	3.0	8.0	13.0	---	27.0	26.0	31.0	25.0
19	---	5.0	3.0	1.0	3.0	6.0	16.0	---	26.0	26.0	31.0	21.0
20	10.0	7.0	2.0	0.0	2.0	8.0	13.0	---	26.0	28.0	32.0	22.0
21	12.0	4.0	1.0	0.0	2.0	8.0	14.0	---	26.0	28.0	33.0	18.0
22	10.0	4.0	1.0	0.0	0.0	10.0	16.0	---	25.0	27.0	31.0	21.0
23	9.0	5.0	0.0	0.0	2.0	12.0	17.0	---	26.0	27.0	29.0	20.0
24	8.0	2.0	0.0	1.0	0.0	14.0	13.0	---	---	---	25.0	20.0
25	10.0	2.0	0.0	0.0	0.0	12.0	15.0	---	---	27.0	32.0	20.0
26	8.0	2.0	1.0	0.0	0.0	12.0	16.0	---	---	28.0	32.0	18.0
27	8.0	0.0	1.0	1.0	1.0	13.0	17.0	---	---	27.0	33.0	17.0
28	8.0	1.0	3.0	2.0	3.0	8.0	17.0	---	---	27.0	28.0	15.0
29	7.0	1.0	4.0	0.0	---	6.0	12.0	---	---	29.0	27.0	15.0
30	6.0	0.0	4.0	2.0	---	7.0	19.0	---	---	28.0	25.0	12.4
31	6.0	---	5.0	2.0	---	10.0	---	---	---	30.0	20.0	---

05474000 SKUNK RIVER AT AUGUSTA, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

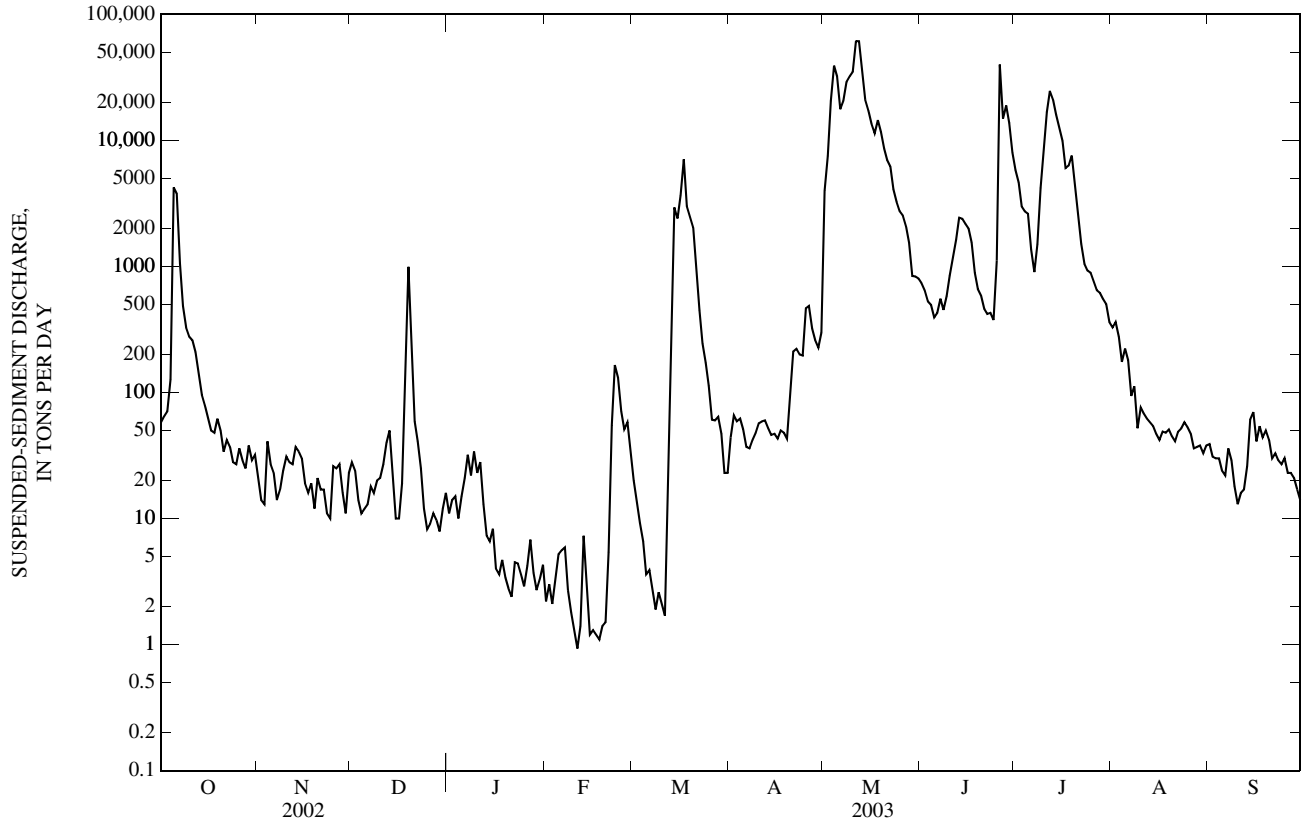
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	75	58	16	21	51	28	15	11	7	2.2	14	20
2	75	65	11	14	50	24	22	14	9	3.0	13	14
3	74	71	10	13	32	14	27	15	6	2.1	11	9.2
4	130	127	31	41	24	11	17	10	13	3.3	9	6.6
5	958	4,230	21	27	27	12	18	15	22	5.2	8	3.6
6	643	3,790	18	23	24	13	24	21	24	5.6	8	3.9
7	304	1,060	11	14	25	18	34	32	27	5.9	6	2.8
8	187	484	13	17	23	16	31	22	14	2.7	4	1.9
9	150	326	18	24	32	20	43	34	8	1.8	8	2.6
10	137	278	24	31	33	21	37	23	6	1.3	7	2.1
11	123	260	21	28	42	27	42	28	4	0.93	6	1.7
12	106	210	22	27	50	40	28	13	8	1.4	28	24
13	79	140	31	37	60	50	16	7.3	40	7.3	133	387
14	60	96	30	34	31	23	13	6.6	19	2.8	351	2,940
15	53	79	27	30	15	10	18	8.3	9	1.2	247	2,400
16	45	62	18	19	14	10	10	4.0	10	1.3	359	3,670
17	39	50	15	16	23	19	9	3.6	9	1.2	525	7,080
18	40	48	19	19	95	136	12	4.7	7	1.1	304	3,010
19	53	62	13	12	518	994	9	3.4	8	1.4	303	2,490
20	44	50	22	21	166	236	8	2.8	7	1.5	321	2,030
21	31	34	18	17	48	59	7	2.4	11	5.4	231	1,020
22	40	42	19	17	31	41	14	4.5	29	55	130	449
23	36	37	12	11	26	25	15	4.4	47	165	86	245
24	27	28	11	10	21	12	12	3.6	45	131	70	172
25	24	27	29	26	16	8.2	10	2.9	33	71	52	113
26	30	36	28	25	19	9.1	15	4.2	26	51	32	61
27	25	29	32	27	17	11	25	6.8	25	58	35	60
28	21	25	21	16	13	9.7	13	3.7	18	34	42	64
29	32	38	16	11	9	7.9	10	2.7	---	---	30	47
30	21	29	32	23	13	12	12	3.3	---	---	16	23
31	22	32	---	---	17	16	15	4.3	---	---	17	23
TOTAL	---	11,903	---	651	---	1,932.9	---	321.5	---	623.63	---	26,376.4

05474000 SKUNK RIVER AT AUGUSTA, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	34	44	764	3,980	157	737	658	5,830	121	328	47	39
2	51	66	868	7,530	144	646	545	4,640	142	362	38	31
3	47	59	1,650	20,600	123	528	403	2,990	115	277	41	30
4	49	62	2,610	39,200	124	497	426	2,730	81	175	46	30
5	40	51	1,870	32,200	103	395	455	2,620	105	223	37	24
6	31	37	1,300	17,700	107	428	257	1,360	93	181	37	22
7	28	36	1,410	20,500	132	555	189	903	51	94	66	36
8	29	42	1,780	29,100	108	453	279	1,500	50	112	56	29
9	33	48	1,600	32,300	132	584	552	4,200	45	52	38	18
10	40	57	1,560	35,000	158	847	815	8,380	47	76	29	13
11	46	59	2,060	61,400	194	1,180	1,170	16,700	44	68	37	16
12	44	60	2,180	61,300	237	1,630	1,690	24,700	42	62	36	17
13	38	52	1,470	35,800	333	2,440	1,460	21,000	41	58	44	26
14	33	46	975	21,000	361	2,390	1,160	16,000	41	54	40	61
15	34	47	851	17,200	348	2,180	925	12,700	36	47	48	70
16	30	43	737	13,600	334	2,000	746	9,900	35	42	33	41
17	33	50	712	11,400	282	1,550	556	6,030	43	49	38	54
18	31	48	980	14,500	181	888	644	6,310	45	48	36	44
19	28	43	851	11,700	147	661	746	7,570	50	51	43	50
20	52	106	687	8,650	141	587	569	4,350	46	45	46	42
21	98	211	608	6,990	120	461	380	2,490	41	41	40	30
22	91	222	572	6,200	115	419	276	1,510	47	49	45	33
23	84	200	413	4,100	124	428	217	1,050	50	52	45	29
24	78	196	352	3,250	117	376	216	929	53	58	48	27
25	128	465	313	2,750	307	1,110	229	891	47	53	55	30
26	129	486	305	2,540	2,790	39,900	217	764	44	47	42	23
27	91	322	275	2,080	1,510	14,900	203	647	44	36	41	23
28	80	261	230	1,540	1,450	18,900	207	616	50	37	39	21
29	74	228	138	841	1,250	13,700	202	551	45	38	32	17
30	104	299	153	834	850	7,980	200	503	41	33	28	14
31	---	---	160	803	---	---	141	361	49	38	---	---
TOTAL	---	3,946	---	526,588	---	119,350	---	170,725	---	2,886	---	940
YEAR	866,243.43											

05474000 SKUNK RIVER AT AUGUSTA, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05474500 MISSISSIPPI RIVER AT KEOKUK, IA

LOCATION.--Lat 40°23'37", long 91°22'27", in SE¼ SW¼ sec.30, T.65 N., R.4 W., Lee County, Hydrologic Unit 07080104, near right bank in tailwater of dam and powerplant of Union Electric Co. at Keokuk, 0.2 mi upstream from bridge on U.S. Highway 136, 2.7 mi upstream from Des Moines River, and at mile 364.2 upstream from Ohio River.

DRAINAGE AREA.--119,000 mi^2, approximately.

PERIOD OF RECORD.--January 1878 to current year.

GAGE.--Water-stage recorder. Datum of gage is 477.41 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers). Jan. 1, 1878 to May 1913, nonrecording gage at Galland (formerly Nashville), 8 mi upstream; zero of gage was set to low-water mark of 1864, or 496.52 ft above sea level.

REMARKS.--Discharge computed from records of operation of turbines in powerplant and spillway gates in dam. Minor flow regulation caused by powerplant since 1913 and navigation dams. Records for May 1913 to September 1937 adjusted for change in contents in Keokuk Reservoir, those after September 1937 unadjusted.

COOPERATION.--Records provided by Ameren-Union Electric Co.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 6, 1851, reached a stage of 21.0 ft, present site and datum, estimated as 13.5 ft at Galland, discharge, 360,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51,700	72,700	46,700	43,200	27,500	32,100	67,900	139,700	127,500	71,700	44,900	21,400
2	56,100	70,000	47,400	45,700	29,000	32,200	63,400	148,800	118,000	79,700	41,400	21,700
3	62,500	70,800	42,700	42,300	30,000	32,400	62,600	150,900	112,800	77,600	39,900	21,500
4	67,500	71,400	35,800	42,100	28,600	30,600	70,200	152,500	105,600	79,700	38,800	21,700
5	77,100	71,900	30,000	39,400	28,000	30,300	70,100	153,300	100,600	82,600	34,400	19,100
6	79,100	71,600	28,100	39,800	29,600	27,900	67,700	147,200	96,000	77,500	35,800	18,300
7	80,000	70,600	28,900	38,500	28,900	26,000	63,800	138,500	84,400	86,200	36,000	16,900
8	77,800	60,700	32,000	39,000	28,600	26,000	60,000	131,400	76,600	91,900	34,700	16,000
9	76,700	60,300	32,000	37,600	27,700	26,900	56,500	127,700	78,300	109,900	36,200	13,900
10	74,200	55,500	34,000	38,100	28,500	25,000	54,300	128,100	75,300	101,400	35,500	13,500
11	83,700	56,100	35,100	33,200	29,700	24,500	54,600	128,900	73,400	105,700	36,300	14,000
12	94,800	61,600	36,900	24,000	29,500	25,900	49,900	138,900	76,200	114,400	35,100	15,600
13	92,300	59,900	44,500	22,200	28,500	31,200	47,500	138,200	79,400	114,800	32,200	21,200
14	99,300	58,400	43,100	22,700	29,100	36,900	43,400	139,500	81,200	107,100	31,200	38,700
15	106,300	59,600	45,100	30,000	29,900	36,700	44,300	141,400	80,400	103,800	28,300	42,700
16	103,800	58,400	50,900	35,100	29,100	44,100	46,400	145,100	79,900	94,900	27,300	34,100
17	112,100	59,300	49,200	30,800	26,300	49,600	51,200	148,000	85,000	96,200	25,300	28,700
18	110,400	56,600	48,600	27,400	26,400	52,900	48,900	148,900	83,800	95,100	25,800	25,800
19	114,200	53,600	48,300	26,200	28,300	61,300	48,800	151,800	82,200	91,100	24,200	23,900
20	113,800	51,100	46,700	26,800	29,200	76,100	56,100	157,900	84,200	81,800	20,100	20,500
21	108,800	50,400	49,600	27,400	28,100	70,300	67,200	164,000	78,700	79,900	19,500	20,200
22	105,300	52,700	51,200	27,700	28,900	72,700	74,900	170,000	76,700	82,000	23,700	25,600
23	100,400	53,100	47,400	30,400	31,200	74,000	89,700	174,200	66,400	78,100	26,400	31,400
24	96,000	51,400	44,700	27,600	32,700	75,400	94,600	178,900	60,400	75,400	26,500	30,300
25	89,100	48,000	36,400	28,300	32,600	72,900	103,300	181,100	52,300	70,100	23,100	26,200
26	78,300	46,800	35,200	26,100	29,600	70,800	106,300	179,300	57,000	63,500	27,400	24,800
27	76,200	45,700	30,800	26,600	30,600	72,300	115,200	174,400	59,700	54,200	27,800	24,300
28	76,500	43,700	30,400	27,400	31,800	65,900	120,000	166,800	57,600	53,700	23,300	24,000
29	78,600	45,500	31,900	28,600	---	68,700	125,200	155,100	62,400	53,000	20,900	21,600
30	80,500	48,000	36,700	28,000	---	70,300	130,700	144,000	64,700	50,500	19,500	17,500
31	70,700	---	41,500	26,900	---	68,000	---	137,600	---	46,800	18,900	---
TOTAL	2,693,800	1,735,400	1,241,800	989,100	817,900	1,509,900	2,154,700	4,682,100	2,416,700	2,570,300	920,400	695,100
MEAN	86,900	57,850	40,060	31,910	29,210	48,710	71,820	151,000	80,560	82,910	29,690	23,170
MAX	114,000	72,700	51,200	45,700	32,700	76,100	131,000	181,000	128,000	115,000	44,900	42,700
MIN	51,700	43,700	28,100	22,200	26,300	24,500	43,400	128,000	52,300	46,800	18,900	13,500
AC-FT	5,343,000	3,442,000	2,463,000	1,962,000	1,622,000	2,995,000	4,274,000	9,287,000	4,794,000	5,098,000	1,826,000	1,379,000
CFSM	0.73	0.49	0.34	0.27	0.25	0.41	0.60	1.27	0.68	0.70	0.25	0.19
IN.	0.84	0.54	0.39	0.31	0.26	0.47	0.67	1.46	0.76	0.80	0.29	0.22

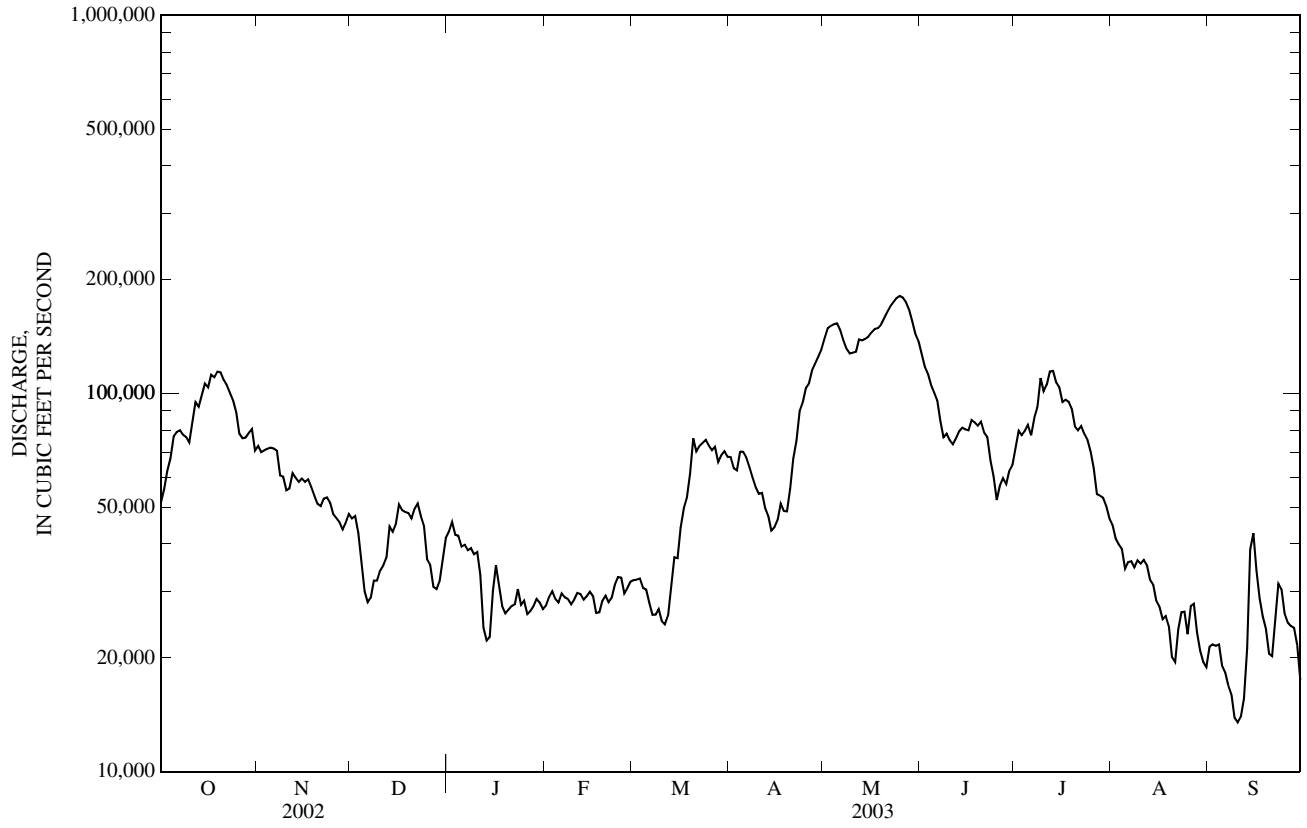
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1879 - 2003, BY WATER YEAR (WY)

MEAN	51,130	51,210	38,720	36,100	42,800	80,320	119,800	109,600	94,510	75,080	49,800	47,360
MAX	221,100	211,300	125,600	101,600	95,620	185,400	250,100	260,700	227,300	385,800	223,000	163,300
(WY)	(1882)	(1882)	(1983)	(1973)	(1984)	(1973)	(1993)	(1888)	(1892)	(1993)	(1993)	(1993)
MIN	16,060	16,020	13,450	14,650	15,790	21,780	32,930	27,600	17,400	16,280	13,030	15,530
(WY)	(1934)	(1934)	(1934)	(1940)	(1899)	(1934)	(1895)	(1934)	(1934)	(1988)	(1936)	(1976)

05474500 MISSISSIPPI RIVER AT KEOKUK, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1879 - 2003	
ANNUAL TOTAL	29,541,200		22,427,200			
ANNUAL MEAN	80,930		61,440		66,420	
HIGHEST ANNUAL MEAN					162,500	1993
LOWEST ANNUAL MEAN					21,540	1934
HIGHEST DAILY MEAN	199,000	Jun 9	181,000	May 25	434,000	Jul 10, 1993
LOWEST DAILY MEAN	28,100	Dec 6	13,500	Sep 10	5,000	Dec 27, 1933
ANNUAL SEVEN-DAY MINIMUM	31,400	Dec 5	15,500	Sep 6	8,270	Dec 25, 1933
MAXIMUM PEAK FLOW					446,000	Jul 10, 1993
MAXIMUM PEAK STAGE					27.58	Jul 10, 1993a
ANNUAL RUNOFF (AC-FT)	58,590,000		44,480,000		48,120,000	
ANNUAL RUNOFF (CFSM)	0.68		0.52		0.56	
ANNUAL RUNOFF (INCHES)	9.23		7.01		7.58	
10 PERCENT EXCEEDS	140,000		116,000		134,000	
50 PERCENT EXCEEDS	71,800		50,900		51,000	
90 PERCENT EXCEEDS	40,800		25,500		23,000	

a From floodmark.



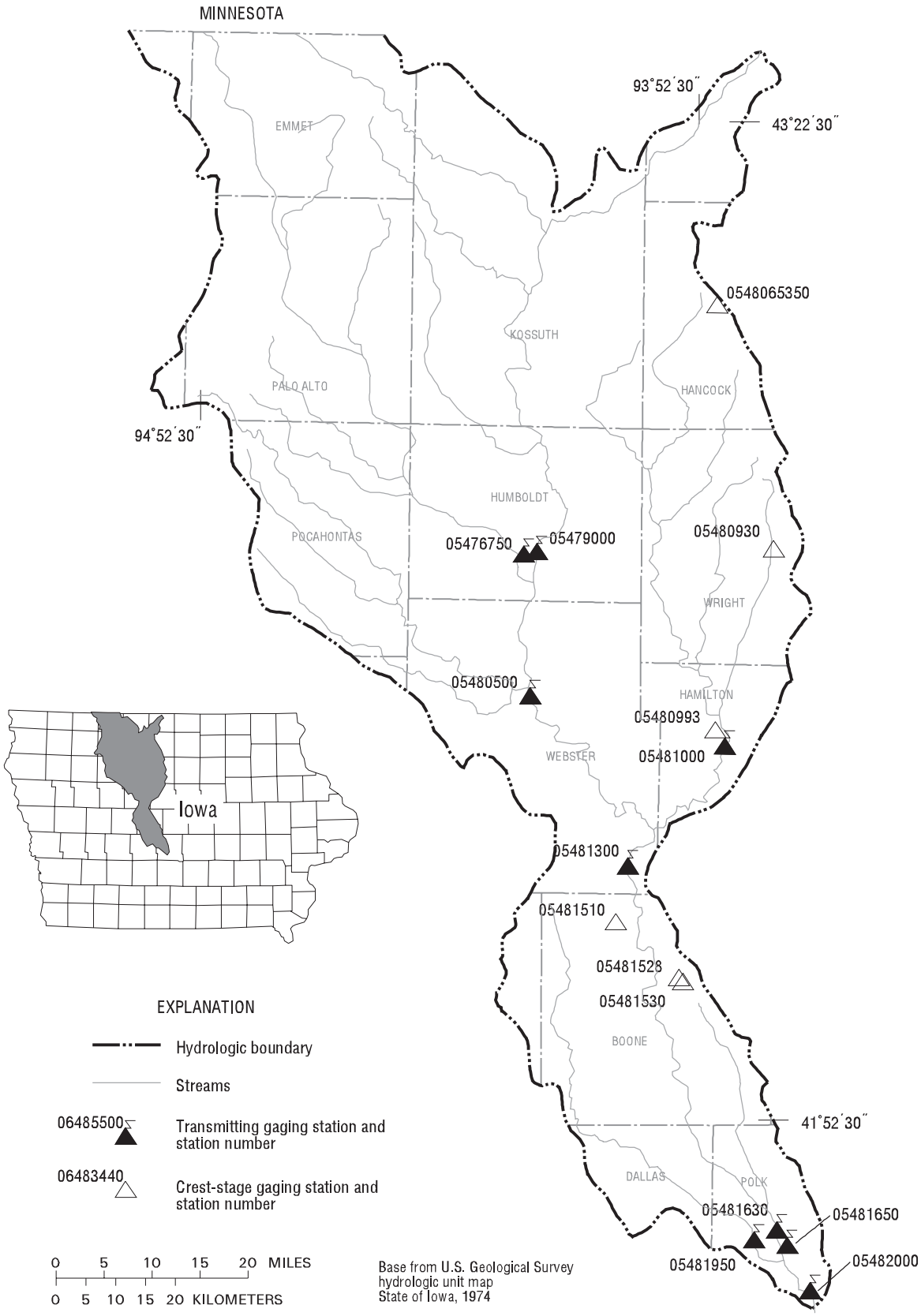


Figure 12. Locations of active continuous-record and crest-stage gaging stations in the Upper Des Moines River drainage basin.

Gaging Stations

05476750 Des Moines River at Humboldt, IA 256
05479000 East Fork Des Moines River at Dakota City, IA 258
05480500 Des Moines River at Fort Dodge, IA 260
05481000 Boone River near Webster City, IA 262
05481300 Des Moines River near Stratford, IA 264
05481630 Saylorville Lake near Saylorville, IA 266
05481650 Des Moines River near Saylorville, IA 268
05481950 Beaver Creek near Grimes, IA 276
05482000 Des Moines River at Second Avenue at Des Moines, IA. 278

Crest Stage Gaging Stations

0548065350 Drainage Ditch 97 Tributary near Britt, IA 461
05480930 White Fox Creek at Clarion, IA 461
05480993 Brewers Creek Tributary near Webster City, IA 461
05481510 Bluff Creek at Pilot Mound, IA 461
05481528 Peas Creek Tributary at Boone, IA. 461
05481530 Peas Creek at Boone, IA. 461

05476750 DES MOINES RIVER AT HUMBOLDT, IA

LOCATION.--Lat 42°43'12", long 94°13'06", in SE¼ SW¼ sec.1, T.91 N., R.29 W., Humboldt County, Hydrologic Unit 07100002 on left bank 5 ft downstream from First Avenue in city of Humboldt, .84 mi downstream of Reasoner Dam, about 700 ft downstream from City of Humboldt water plant, 3.2 mi upstream from Indian Creek, 3.9 mi upstream from East Fork Des Moines River, and at mile 334.3 upstream from mouth of Des Moines River.

DRAINAGE AREA.--2,256 mi^2.

PERIOD OF RECORD.--October 1964 to current year. Prior to October 1970, published as "West Fork Des Moines River at Humboldt."

GAGE.--Water stage recorder. Datum of gage is 1,053.54 ft above NGVD of 1929. Prior to Oct. 3, 1966, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Daily nonrecording gage readings made from Mar. 7, 1940 to Sept. 30, 1964, but discharge not published for this period because of extreme regulation at dam 700 ft upstream from gage. Power generation and streamflow regulation discontinued August 1964. Low-flow discharges occasionally affected by minor regulation at Reasoner Dam. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23, 1947, reached a stage of 12.2 ft, discharge, 11,000 ft^3/s at present site and datum.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	346	212	168	e84	87	437	1,430	1,410	2,440	402	134
2	167	342	205	170	e89	e82	394	1,440	1,330	2,160	375	128
3	173	344	207	153	e91	85	395	1,400	1,230	1,890	333	126
4	310	328	171	165	e89	e77	414	1,500	1,200	1,740	298	120
5	487	324	e187	e158	87	e73	402	2,100	1,130	1,780	300	118
6	529	349	180	e156	87	84	395	2,460	1,290	2,160	298	118
7	465	355	206	166	e84	84	421	2,340	1,680	2,060	281	118
8	446	402	e199	173	90	e77	418	2,190	1,860	2,820	260	116
9	430	415	e198	e155	88	e71	403	2,240	1,880	3,670	241	112
10	433	387	207	e140	87	78	425	2,210	2,010	3,880	245	109
11	441	374	e195	125	86	86	536	2,280	2,190	3,500	235	121
12	442	347	e186	e135	84	87	674	2,440	2,200	2,920	221	139
13	433	330	e192	e131	84	89	721	2,500	2,120	2,360	215	140
14	427	320	e193	e129	85	103	725	2,490	1,990	2,000	205	136
15	417	301	198	127	83	149	697	2,420	1,840	1,760	196	122
16	407	301	e191	115	80	242	690	2,370	1,720	1,560	193	119
17	402	301	198	e106	81	295	e613	2,320	1,590	1,390	186	121
18	398	306	213	e96	85	333	e588	2,230	1,530	1,220	179	121
19	383	300	222	e98	84	301	e563	2,070	1,640	1,120	178	116
20	379	292	214	99	90	332	e726	2,030	1,560	1,040	179	120
21	379	300	199	96	94	375	e1,030	2,110	1,410	962	172	132
22	368	296	177	e89	e90	429	1,220	2,170	1,310	883	165	136
23	366	304	150	e76	e83	429	1,430	2,110	1,260	797	166	129
24	371	e296	153	e81	e79	392	1,490	2,020	2,060	733	160	125
25	377	e285	159	80	e75	394	1,540	1,860	3,380	661	156	115
26	368	256	e153	e69	e82	354	1,560	1,810	4,030	597	156	115
27	358	e204	e158	e72	87	362	1,550	1,810	4,420	547	145	112
28	360	213	e155	e74	88	406	1,500	1,770	4,140	511	147	109
29	358	e247	e153	e71	---	595	1,440	1,690	3,430	475	141	105
30	357	e217	e152	79	---	e569	1,480	1,610	2,820	430	134	101
31	350	---	e148	e77	---	490	---	1,500	---	418	136	---
TOTAL	11,728	9,382	5,731	3,629	2,396	7,610	24,877	62,920	61,660	50,484	6,698	3,633
MEAN	378	313	185	117	85.6	245	829	2,030	2,055	1,629	216	121
MAX	529	415	222	173	94	595	1,560	2,500	4,420	3,880	402	140
MIN	147	204	148	69	75	71	394	1,400	1,130	418	134	101
AC-FT	23,260	18,610	11,370	7,200	4,750	15,090	49,340	124,800	122,300	100,100	13,290	7,210
CFSM	0.17	0.14	0.08	0.05	0.04	0.11	0.37	0.90	0.91	0.72	0.10	0.05
IN.	0.19	0.15	0.09	0.06	0.04	0.13	0.41	1.04	1.02	0.83	0.11	0.06

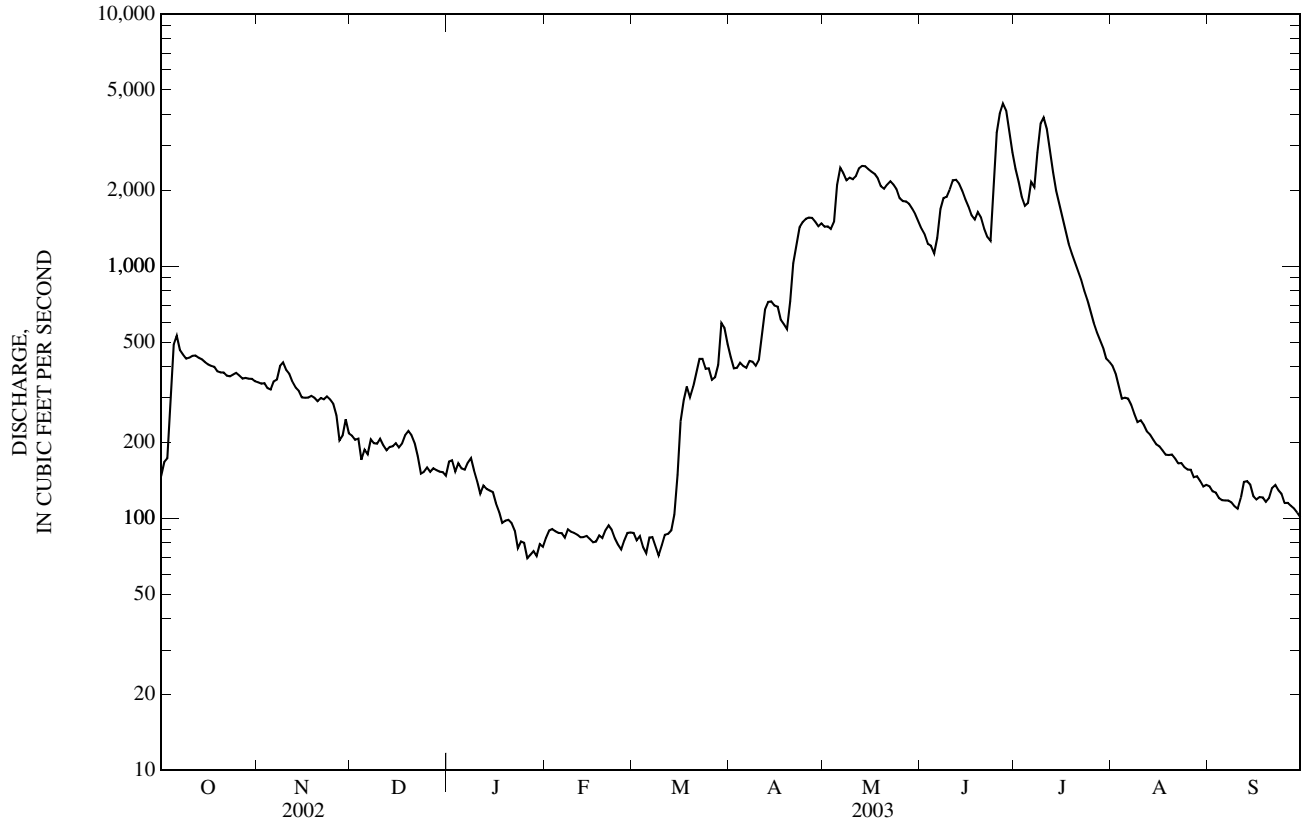
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2003, BY WATER YEAR (WY)

MEAN	605	633	406	228	324	1,237	2,698	2,004	1,970	1,558	682	498
MAX	3,768	2,656	1,675	1,078	1,570	5,110	8,454	6,428	9,126	11,540	4,477	3,097
(WY)	(1987)	(1980)	(1983)	(1983)	(1983)	(1983)	(1969)	(2001)	(1993)	(1993)	(1993)	(1979)
MIN	20.4	28.8	19.9	13.5	19.8	78.9	94.4	77.6	72.3	81.0	42.4	30.1
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1968)	(1968)	(1968)	(1977)	(1976)	(1976)	(1976)

05476750 DES MOINES RIVER AT HUMBOLDT, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1965 - 2003	
ANNUAL TOTAL	158,052		250,748			
ANNUAL MEAN	433		687		1,072	
HIGHEST ANNUAL MEAN					4,136	1993
LOWEST ANNUAL MEAN					74.3	1977
HIGHEST DAILY MEAN	2,140	Jun 13	4,420	Jun 27	17,800	Apr 14, 1969
LOWEST DAILY MEAN	69	Aug 3	69	Jan 26a	13	Nov 12, 1976
ANNUAL SEVEN-DAY MINIMUM	88	Jul 28	75	Jan 25	13	Jan 12, 1977
MAXIMUM PEAK FLOW			4,610	Jun 27	19,000	Jul 13, 1993
MAXIMUM PEAK STAGE			8.01	Jun 27	15.40	Apr 14, 1969
INSTANTANEOUS LOW FLOW			12	Dec 21	13	Jan 12, 1977
ANNUAL RUNOFF (AC-FT)	313,500		497,400		776,500	
ANNUAL RUNOFF (CFSM)	0.19		0.30		0.48	
ANNUAL RUNOFF (INCHES)	2.61		4.13		6.46	
10 PERCENT EXCEEDS	891		2,060		2,850	
50 PERCENT EXCEEDS	301		301		434	
90 PERCENT EXCEEDS	153		87		68	

a Ice affected.
e Estimated.



05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IA

LOCATION.--Lat 42°43'26", long 94°11'30", in NW¼ SE¼ sec.6, T.91 N., R.28 W., Humboldt County, Hydrologic Unit 07100003, on right bank 50 ft upstream from old mill dam, in city park at east edge of Dakota City, 500 ft upstream from bridge on county highway P56, 0.6 mi downstream from bridge on State Highway 3, 3.4 mi upstream from confluence with Des Moines River, and at mile 333.8 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,308 mi^2.

PERIOD OF RECORD.--March 1940 to current year. Prior to October 1954, published as "near Hardy".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1944, 1945-47 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,038.71 ft above NGVD of 1929. Prior to Oct. 1, 1954, nonrecording gage at site 8 mi upstream at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of September 1938 reached a stage of 17.4 ft, discharge, about 22,000 ft^3/s, site and datum in use during the period 1940-54.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	318	e174	e124	e79	e68	382	602	781	2,620	245	47
2	84	320	e162	e117	e85	e57	339	604	744	2,320	224	46
3	120	315	e170	e106	e84	e60	313	599	711	1,950	202	44
4	381	311	e151	e118	e79	e57	301	721	678	1,610	184	41
5	855	306	e163	e115	e76	e53	294	1,580	649	1,470	180	40
6	895	307	e157	e111	e73	e62	302	1,890	874	1,950	178	37
7	927	301	e179	e116	e68	e64	322	1,860	1,570	1,770	166	37
8	945	298	e167	e126	e72	e52	348	1,840	1,830	2,550	153	36
9	938	298	e167	e122	e65	e44	350	2,180	2,120	4,000	145	35
10	904	294	e175	e113	e65	e51	364	2,310	2,130	4,400	136	34
11	845	292	e168	e89	e68	e61	482	2,390	2,120	3,780	139	38
12	758	275	e162	e93	e60	e68	605	2,460	1,980	3,080	151	56
13	673	270	e168	e90	e63	e70	665	2,420	1,810	2,580	127	51
14	613	267	e170	e85	e68	e78	679	2,360	1,670	2,260	114	50
15	571	264	e176	e81	e65	e87	662	2,350	1,530	2,060	104	41
16	526	256	e169	e78	e60	e102	648	2,330	1,380	1,750	98	37
17	504	248	175	e71	e62	e149	629	2,240	1,240	1,430	90	35
18	481	249	175	e67	e69	e195	610	2,080	1,140	1,200	87	36
19	453	245	174	e72	e65	189	610	1,870	1,090	1,040	85	36
20	425	243	165	e79	e69	203	684	1,640	1,000	915	85	33
21	406	240	152	e74	e68	181	849	1,440	924	844	79	34
22	386	233	135	e68	e61	150	905	1,310	849	727	73	35
23	368	229	119	e61	e55	129	946	1,220	844	635	69	34
24	359	222	107	e62	e50	118	945	1,170	1,430	569	65	32
25	356	212	e120	e53	e44	114	895	1,130	2,710	509	62	30
26	358	209	e121	e46	e48	114	816	1,080	3,920	453	61	30
27	346	169	e126	e51	e52	124	741	1,030	4,050	402	59	31
28	340	e180	e125	e56	e65	142	673	973	3,620	361	56	29
29	338	e201	e119	e50	---	207	622	927	3,180	324	54	27
30	333	e179	e117	e57	---	328	602	892	2,880	291	50	27
31	324	---	e110	e66	---	404	---	836	---	268	48	---
TOTAL	15,879	7,751	4,718	2,617	1,838	3,781	17,583	48,334	51,454	50,118	3,569	1,119
MEAN	512	258	152	84.4	65.6	122	586	1,559	1,715	1,617	115	37.3
MAX	945	320	179	126	85	404	946	2,460	4,050	4,400	245	56
MIN	67	169	107	46	44	44	294	599	649	268	48	27
AC-FT	31,500	15,370	9,360	5,190	3,650	7,500	34,880	95,870	102,100	99,410	7,080	2,220
CFSM	0.39	0.20	0.12	0.06	0.05	0.09	0.45	1.19	1.31	1.24	0.09	0.03
IN.	0.45	0.22	0.13	0.07	0.05	0.11	0.50	1.37	1.46	1.43	0.10	0.03

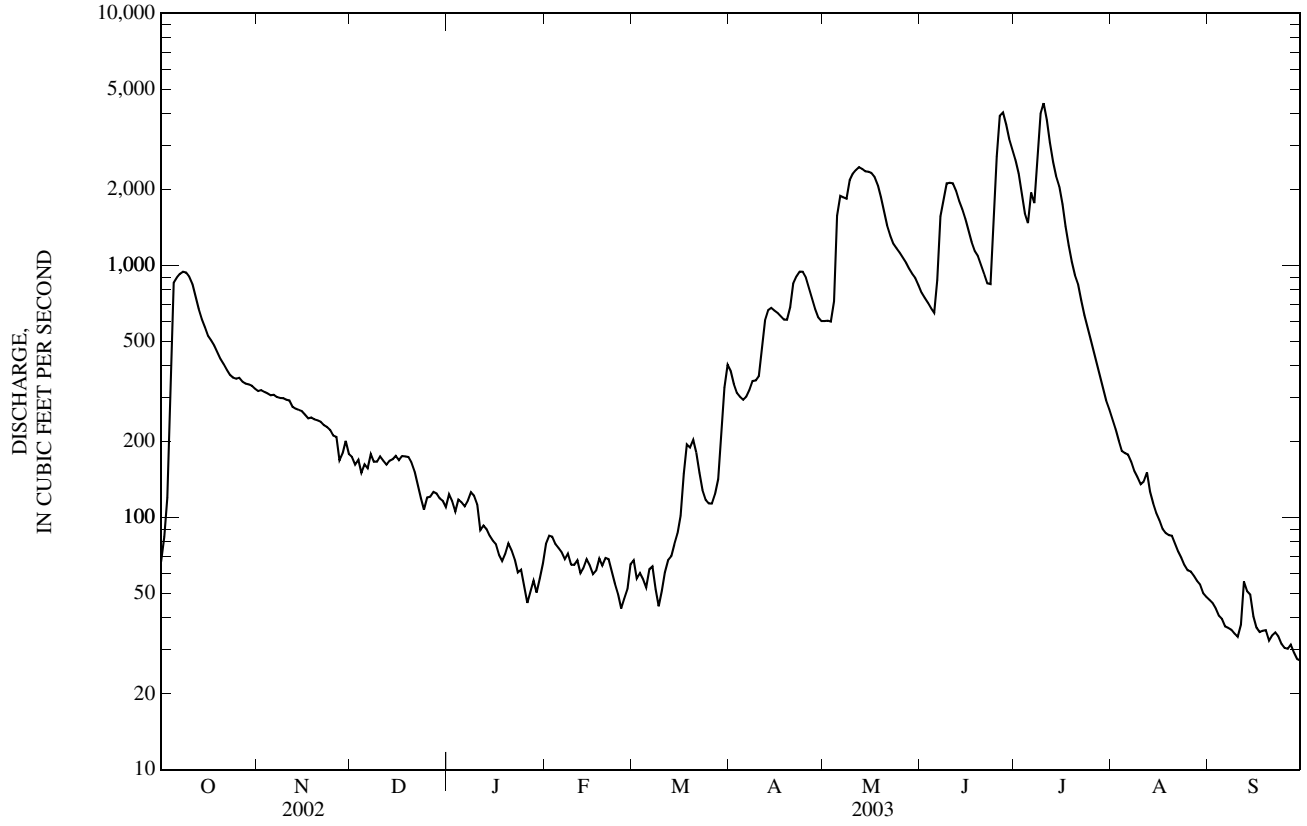
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	310	316	217	124	231	896	1,581	1,223	1,390	907	397	316
MAX	1,713	2,042	1,340	836	1,602	4,033	14,300	12,850	8,143	6,777	4,114	2,666
(WY)	(1983)	(1942)	(1992)	(1992)	(1984)	(1983)	(2001)	(2001)	(2001)	(1993)	(1979)	(1979)
MIN	12.0	14.2	8.45	5.12	10.4	39.4	58.8	75.7	36.3	13.7	15.5	7.40
(WY)	(1959)	(1959)	(1977)	(1977)	(1959)	(1968)	(1977)	(1977)	(1977)	(1977)	(1976)	(1976)

05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	96,879		208,761			
ANNUAL MEAN	265		572		660	
HIGHEST ANNUAL MEAN					3,559	2001
LOWEST ANNUAL MEAN					29.7	1977
HIGHEST DAILY MEAN	1,210	Aug 17	4,400	Jul 10	21,000	May 4, 2001
LOWEST DAILY MEAN	46	Jul 29	27	Sep 29a	4.8	Jan 11, 1977
ANNUAL SEVEN-DAY MINIMUM	54	Jul 26	29	Sep 24	4.8	Jan 8, 1977
MAXIMUM PEAK FLOW			4,490	Jul 10	18,800	Jun 21, 1954
MAXIMUM PEAK STAGE			14.35	Jul 10	24.02	Jun 21, 1954
INSTANTANEOUS LOW FLOW			26	Sep 30	4.8	Jan 11, 1977b
ANNUAL RUNOFF (AC-FT)	192,200		414,100		477,900	
ANNUAL RUNOFF (CFSM)	0.20		0.44		0.50	
ANNUAL RUNOFF (INCHES)	2.76		5.94		6.85	
10 PERCENT EXCEEDS	582		1,830		1,730	
50 PERCENT EXCEEDS	177		202		210	
90 PERCENT EXCEEDS	73		51		24	

a Also Sept. 30.
b Also Jan. 12-14, 1977.
e Estimated.



05480500 DES MOINES RIVER AT FORT DODGE, IA

LOCATION.--Lat 42°30'22", long 94°12'04", in NW¼ SW¼ sec.19, T.89 N., R.28 W., Webster County, Hydrologic Unit 07100004, on right bank 400 ft upstream from Soldier Creek, 1,800 ft downstream from Illinois Central Railroad bridge in Fort Dodge, 2,000 ft downstream from Lizard Creek, and at mile 314.6.

DRAINAGE AREA.--4,190 mi^2.

PERIOD OF RECORD.--April 1905 to July 1906 (no winter records), October 1913 to September 1927 (published as "at Kalo"), October 1946 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1924, 1925 (M).

GAGE.--Water-stage recorder. Datum of gage is 969.38 ft above NGVD of 1929. See WSP 1728 for history of changes prior to Dec. 8, 1949.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam 0.8 mi upstream from gage. U.S. Army Corps of Engineers satellite data collection platform and City of Fort Dodge gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	249	891	e527	436	240	e139	933	3,500	2,330	7,070	1,020	198
2	296	890	e582	e420	e239	e130	867	3,340	2,250	6,320	964	188
3	342	893	e552	422	e236	e150	827	3,130	2,140	5,360	885	175
4	1,020	874	e577	418	e226	e136	848	4,160	2,020	4,590	805	168
5	1,890	859	e556	432	e218	e126	839	8,040	2,020	5,700	791	162
6	1,820	865	e578	414	e195	e150	823	8,280	2,410	6,950	776	160
7	1,630	854	e578	403	e182	e156	890	7,380	3,620	6,910	733	155
8	1,550	869	e575	e409	e182	e144	889	6,590	4,550	8,430	683	151
9	1,500	910	e560	e392	e190	e136	909	7,800	5,310	11,800	635	148
10	1,440	886	584	e350	e173	e153	942	7,370	5,120	12,300	597	146
11	1,390	869	560	296	e179	e185	1,340	7,550	5,050	10,600	620	158
12	1,330	824	566	e301	e154	e196	1,740	7,450	4,900	8,520	575	215
13	1,240	797	e563	e294	e164	e215	1,770	7,150	4,500	7,010	538	217
14	1,180	794	e544	e282	e193	e266	1,760	6,900	4,150	6,070	497	207
15	1,140	779	e550	e277	e150	e363	1,720	6,710	3,840	5,270	469	187
16	1,070	756	538	e298	e139	e543	1,700	6,440	3,550	4,400	444	166
17	1,050	758	530	e290	e142	686	1,660	6,110	3,360	3,810	420	158
18	1,020	761	544	275	e145	696	1,630	5,670	3,170	3,310	398	160
19	1,000	757	552	273	e135	666	1,680	5,110	3,200	2,950	380	163
20	959	740	528	e278	e143	671	1,970	4,630	3,100	2,680	373	156
21	941	734	478	e275	e136	657	2,340	4,240	2,910	2,520	360	171
22	911	729	475	279	e133	675	2,590	4,070	2,770	2,330	335	185
23	882	722	467	e271	e127	655	2,740	3,870	2,740	2,120	316	172
24	886	742	432	e275	e121	622	2,840	3,660	3,700	1,940	301	168
25	886	711	e433	e256	e114	594	2,870	3,460	8,050	1,790	285	158
26	887	630	e439	e241	e127	575	2,840	3,250	12,000	1,610	271	158
27	876	e592	e439	e245	e145	593	2,800	3,060	12,800	1,490	251	158
28	875	643	e436	252	e153	631	2,720	2,900	11,300	1,360	243	150
29	888	712	e432	e234	---	800	2,630	2,750	9,500	1,260	228	146
30	917	562	e428	239	---	958	2,930	2,620	7,980	1,180	212	144
31	907	---	e416	235	---	975	---	2,470	---	1,070	201	---
TOTAL	32,972	23,403	16,019	9,762	4,681	13,642	53,037	159,660	144,340	148,720	15,606	5,048
MEAN	1,064	780	517	315	167	440	1,768	5,150	4,811	4,797	503	168
MAX	1,890	910	584	436	240	975	2,930	8,280	12,800	12,300	1,020	217
MIN	249	562	416	234	114	126	823	2,470	2,020	1,070	201	144
AC-FT	65,400	46,420	31,770	19,360	9,280	27,060	105,200	316,700	286,300	295,000	30,950	10,010
CFSM	0.25	0.19	0.12	0.08	0.04	0.11	0.42	1.23	1.15	1.14	0.12	0.04
IN.	0.29	0.21	0.14	0.09	0.04	0.12	0.47	1.42	1.28	1.32	0.14	0.04

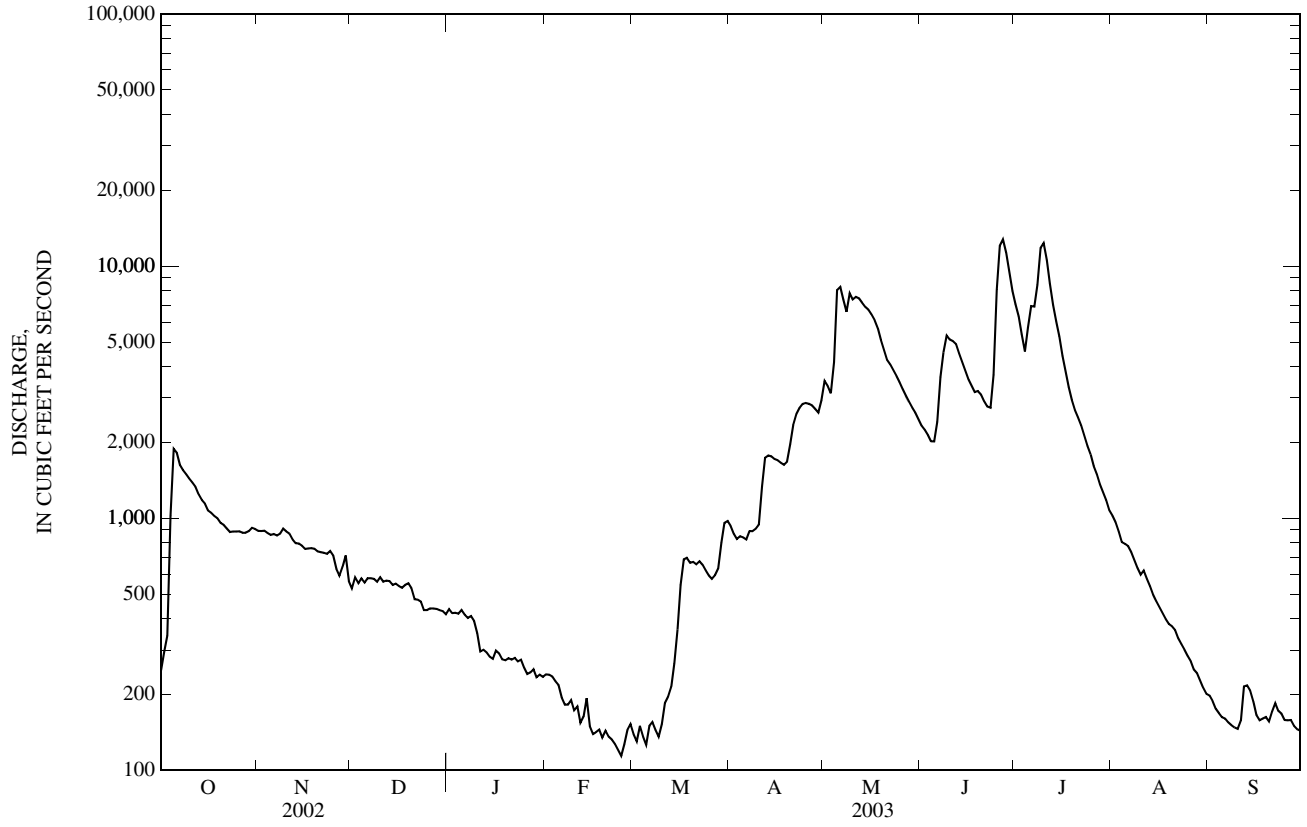
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2003, BY WATER YEAR (WY)

MEAN	899	865	604	384	785	2,524	4,156	3,111	3,483	2,412	1,096	875
MAX	6,120	4,447	3,698	2,257	4,352	11,070	17,530	12,490	16,150	21,530	9,264	6,206
(WY)	(1987)	(1983)	(1983)	(1983)	(1984)	(1983)	(1993)	(2001)	(1993)	(1993)	(1993)	(1979)
MIN	32.8	54.5	34.7	24.0	35.5	141	224	149	138	75.2	69.0	49.9
(WY)	(1957)	(1959)	(1977)	(1977)	(1959)	(1968)	(2000)	(1926)	(1977)	(1926)	(1976)	(1976)

05480500 DES MOINES RIVER AT FORT DODGE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1914 - 2003	
ANNUAL TOTAL	365,045		626,890			
ANNUAL MEAN	1,000		1,718		1,767	
HIGHEST ANNUAL MEAN					7,882	1993
LOWEST ANNUAL MEAN					143	1977
HIGHEST DAILY MEAN	4,320	May 13	12,800	Jun 27	35,100	Apr 8, 1965
LOWEST DAILY MEAN	245	Sep 25	114	Feb 25a	14	Nov 3, 1955
ANNUAL SEVEN-DAY MINIMUM	259	Sep 24	129	Feb 20	23	Jan 13, 1977
MAXIMUM PEAK FLOW			13,100	Jun 27	35,600	Apr 8, 1965
MAXIMUM PEAK STAGE			9.12	Jun 27	19.62	Jun 23, 1947
INSTANTANEOUS LOW FLOW					14	Nov 3, 1955
ANNUAL RUNOFF (AC-FT)	724,100		1,243,000		1,280,000	
ANNUAL RUNOFF (CFSM)	0.24		0.41		0.42	
ANNUAL RUNOFF (INCHES)	3.24		5.57		5.73	
10 PERCENT EXCEEDS	2,130		5,110		4,730	
50 PERCENT EXCEEDS	729		729		649	
90 PERCENT EXCEEDS	343		158		106	

a Ice affected.
e Estimated.



05481000 BOONE RIVER NEAR WEBSTER CITY, IA

LOCATION.--Lat 42°26'01", long 93°48'12", in NW¼ SE¼ sec.18, T.88 N., R.25 W., Hamilton County, Hydrologic Unit 07100005, on right bank 100 ft upstream from bridge on State Highway 17, 2.5 mi south of Webster City, and 3.2 mi downstream from Brewers Creek.

DRAINAGE AREA.--844 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1940 (M), WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 989.57 ft above NGVD of 1929. Prior to June 26, 1940, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1896, 19.1 ft about June 10, 1918, from floodmarks, from information by local resident, discharge, 21,500 ft^3/s. Flood of June 18, 1932, reached a stage of 16.0 ft, discharge, 15,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	98	425	116	e132	e90	e61	244	1,410	471	1,960	190	30
2	163	413	e179	e130	e91	e47	239	1,460	456	1,450	173	28
3	355	405	e172	127	e88	e56	240	1,250	446	1,110	156	27
4	1,980	387	e200	139	e79	e52	259	1,400	424	897	148	25
5	3,380	379	187	125	e77	e39	269	5,060	415	1,380	148	25
6	3,170	363	198	123	e72	e53	274	5,960	513	2,060	143	24
7	2,520	344	208	127	e51	e55	311	4,900	613	2,530	129	21
8	2,000	341	194	135	e59	e40	338	4,020	860	3,340	118	21
9	1,580	339	e187	e125	e51	e34	387	3,830	1,510	6,020	105	21
10	1,310	334	e200	e111	e52	e42	459	3,710	1,760	7,750	97	21
11	1,120	317	181	e101	e55	e53	802	3,430	1,710	5,750	102	40
12	980	288	165	e91	e42	e58	1,090	3,420	1,550	3,900	93	46
13	850	284	e165	e88	e47	e59	1,030	2,960	1,360	2,850	83	42
14	765	291	e169	e84	e54	e65	898	2,590	1,130	2,220	78	32
15	731	289	174	e82	e45	e72	807	2,200	949	1,810	73	27
16	673	275	e159	e91	e39	e83	749	1,850	825	1,480	68	30
17	628	269	162	e84	e44	e189	679	1,590	738	1,220	64	24
18	589	268	170	e79	e55	e241	627	1,360	709	1,040	59	22
19	541	262	179	e82	e51	211	648	1,190	676	864	68	e30
20	492	255	175	e90	e61	199	979	1,030	612	765	82	e21
21	462	248	e164	e77	e59	161	1,370	909	547	716	65	e20
22	434	236	145	e67	e51	132	1,370	824	510	717	62	e28
23	404	235	123	e54	e47	113	1,210	760	496	589	54	24
24	399	228	e121	e58	e40	103	1,080	705	476	502	48	21
25	403	214	e137	e46	e36	97	953	657	796	440	44	20
26	399	198	e128	e28	e42	93	844	638	1,980	384	42	19
27	391	153	e135	e35	e50	112	805	634	2,590	335	38	19
28	402	e170	e130	e54	e59	169	747	612	3,010	297	38	18
29	444	e186	e125	e45	---	228	661	578	3,140	266	37	18
30	469	e128	e125	e61	---	252	798	561	2,590	237	33	17
31	448	---	e115	e71	---	248	---	517	---	214	31	---
TOTAL	28,580	8,524	4,988	2,742	1,587	3,417	21,167	62,015	33,862	55,093	2,669	761
MEAN	922	284	161	88.5	56.7	110	706	2,000	1,129	1,777	86.1	25.4
MAX	3,380	425	208	139	91	252	1,370	5,960	3,140	7,750	190	46
MIN	98	128	115	28	36	34	239	517	415	214	31	17
MED	541	280	165	84	52	83	748	1,400	767	1,110	73	24
AC-FT	56,690	16,910	9,890	5,440	3,150	6,780	41,980	123,000	67,170	109,300	5,290	1,510
CFSM	1.09	0.34	0.19	0.10	0.07	0.13	0.84	2.37	1.34	2.11	0.10	0.03
IN.	1.26	0.38	0.22	0.12	0.07	0.15	0.93	2.73	1.49	2.43	0.12	0.03

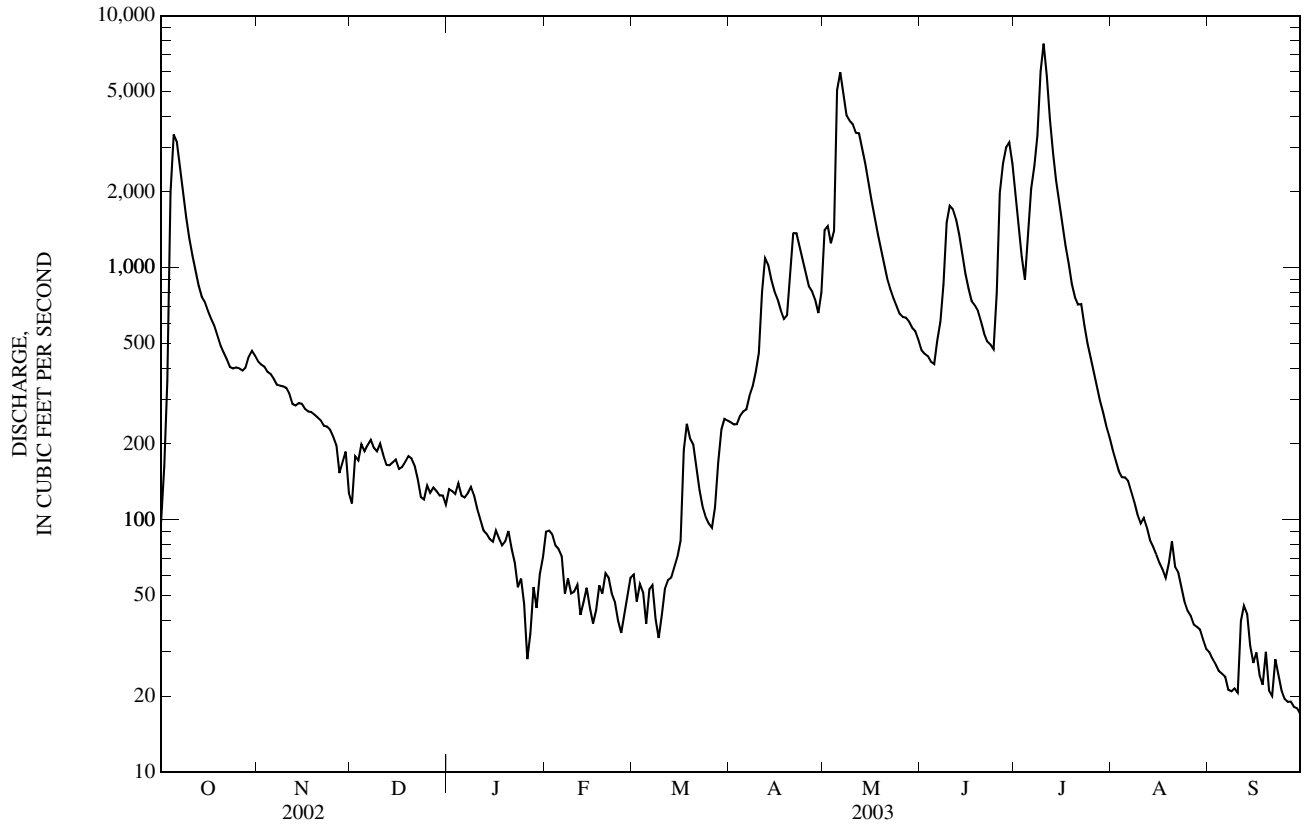
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	242	218	145	97.6	245	791	943	863	1,073	597	260	206
MAX	1,771	1,395	1,181	568	1,847	2,826	4,307	4,315	4,239	4,715	2,942	2,501
(WY)	(1987)	(1993)	(1983)	(1983)	(1984)	(1973)	(1965)	(1991)	(1984)	(1993)	(1993)	(1965)
MIN	6.66	11.0	4.62	0.32	3.60	32.5	33.7	46.0	14.1	8.66	9.79	6.48
(WY)	(1950)	(1950)	(1977)	(1977)	(1950)	(1968)	(1957)	(1968)	(1977)	(1977)	(1949)	(1976)

05481000 BOONE RIVER NEAR WEBSTER CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	148,521		225,405			
ANNUAL MEAN	407		618		474	
HIGHEST ANNUAL MEAN					1,861	1993
LOWEST ANNUAL MEAN					36.1	1956
HIGHEST DAILY MEAN	3,380	Oct 5	7,750	Jul 10	19,500	Jun 22, 1954
LOWEST DAILY MEAN	27	Aug 3	17	Sep 30	0.00	Feb 7, 1977
ANNUAL SEVEN-DAY MINIMUM	44	Jul 28	19	Sep 24	0.01	Feb 1, 1977
MAXIMUM PEAK FLOW			8,020	Jul 10	20,300	Jun 22, 1954
MAXIMUM PEAK STAGE			11.40	Jul 10	18.55	Jun 22, 1954
INSTANTANEOUS LOW FLOW			16	Sep 30	0.00	Feb 7, 1977
ANNUAL RUNOFF (AC-FT)	294,600		447,100		343,300	
ANNUAL RUNOFF (CFSM)	0.48		0.73		0.56	
ANNUAL RUNOFF (INCHES)	6.55		9.93		7.63	
10 PERCENT EXCEEDS	942		1,580		1,220	
50 PERCENT EXCEEDS	208		200		140	
90 PERCENT EXCEEDS	86		39		17	

e Estimated



05481300 DES MOINES RIVER NEAR STRATFORD, IA

LOCATION.--Lat 42°15'04", long 93°59'52", in NW¼ NE¼ sec.21, T.86 N., R.27 W., Webster County, Hydrologic Unit 07100004, on right bank 6 ft downstream from bridge on State Highway 175, 0.1 mi downstream from Skillet Creek, 4.0 mi southwest of Stratford, 7.3 mi downstream from Boone River, and at mile 276.7.

DRAINAGE AREA.--5,452 mi^2.

PERIOD OF RECORD.--October 1967 to current year in reports of U.S. Geological Survey. Replacement station for 05481500 "near Boone", which operated April 1920 to September 1968. Records not necessarily equivalent.

GAGE.--Water-stage recorder. Datum of gage is 894.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam at Fort Dodge. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1903, reached a stage of 25.4 ft, from high-water mark, site and datum then in use, discharge, 43,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	419	1,710	e848	e727	e381	e198	1,430	5,560	3,390	9,320	1,160	269
2	579	1,660	e874	e706	e368	e189	1,370	6,000	3,260	7,900	1,070	263
3	802	1,640	e844	e695	e355	e206	1,290	5,230	3,200	6,650	991	252
4	3,140	1,610	e882	e680	e334	e189	1,270	5,320	2,980	5,590	903	244
5	7,300	1,570	e840	e682	e325	e176	1,310	14,000	2,880	5,900	856	235
6	7,620	1,540	e849	e649	e278	e194	1,270	17,700	3,200	7,970	843	225
7	6,300	1,500	e838	e648	e254	e198	1,330	15,500	4,170	9,270	793	222
8	5,200	1,480	e838	e659	e245	e194	1,400	12,900	5,560	9,760	735	215
9	4,430	1,510	e806	e637	e254	e172	1,440	12,700	6,860	17,700	684	208
10	3,910	1,520	e828	e594	e226	e192	1,570	13,100	7,650	20,900	640	205
11	3,530	1,470	e808	e540	e235	e243	1,900	12,200	7,480	20,600	647	215
12	3,240	1,390	e818	e545	e202	e265	e2,800	12,100	7,250	16,100	629	270
13	2,930	1,330	e825	e532	e212	e310	e2,880	11,400	6,750	11,800	590	290
14	2,670	1,310	e808	e523	e240	e534	e3,070	10,700	6,110	9,370	556	266
15	2,500	1,290	e823	e484	e207	e637	3,000	10,000	5,510	8,060	526	255
16	2,360	1,260	e806	e492	e175	e907	2,840	9,220	4,980	6,810	501	237
17	2,230	1,230	e796	e481	e175	e1,040	2,680	8,530	4,530	5,740	481	219
18	2,130	1,220	e811	e464	e184	e1,220	2,510	7,930	4,280	4,950	460	203
19	2,030	1,210	e811	e465	e166	1,180	2,500	7,320	3,920	4,250	466	208
20	1,900	1,200	e788	e472	e173	1,070	3,030	6,670	3,770	3,780	448	211
21	1,810	1,160	e767	e464	e164	998	3,890	6,090	3,450	3,440	439	207
22	1,740	1,150	e759	e470	e157	932	4,360	5,740	3,170	3,240	418	224
23	1,650	1,130	e747	e458	e153	915	4,430	5,520	2,950	2,900	397	236
24	1,610	1,120	e742	e457	e149	870	4,400	5,210	2,980	2,560	377	218
25	1,610	1,130	e757	e428	e143	814	4,350	4,960	5,830	2,310	361	207
26	1,610	1,070	e752	e396	e163	779	4,130	4,690	11,700	2,080	354	199
27	1,580	1,010	e766	e407	e194	793	3,920	4,410	14,800	1,870	337	193
28	1,610	974	e767	e419	e211	889	3,680	4,200	15,300	1,680	323	191
29	1,690	e980	e763	e380	---	978	3,410	3,980	13,800	1,530	309	184
30	1,770	e1,030	e751	e390	---	1,250	3,930	3,810	11,400	1,400	296	175
31	1,780	---	e709	e373	---	1,410	---	3,620	---	1,270	281	---
TOTAL	83,680	39,404	24,821	16,317	6,323	19,942	81,390	256,310	183,110	216,700	17,871	6,746
MEAN	2,699	1,313	801	526	226	643	2,713	8,268	6,104	6,990	576	225
MAX	7,620	1,710	882	727	381	1,410	4,430	17,700	15,300	20,900	1,160	290
MIN	419	974	709	373	143	172	1,270	3,620	2,880	1,270	281	175
AC-FT	166,000	78,160	49,230	32,360	12,540	39,550	161,400	508,400	363,200	429,800	35,450	13,380
CFSM	0.50	0.24	0.15	0.10	0.04	0.12	0.50	1.52	1.12	1.28	0.11	0.04
IN.	0.57	0.27	0.17	0.11	0.04	0.14	0.56	1.75	1.25	1.48	0.12	0.05

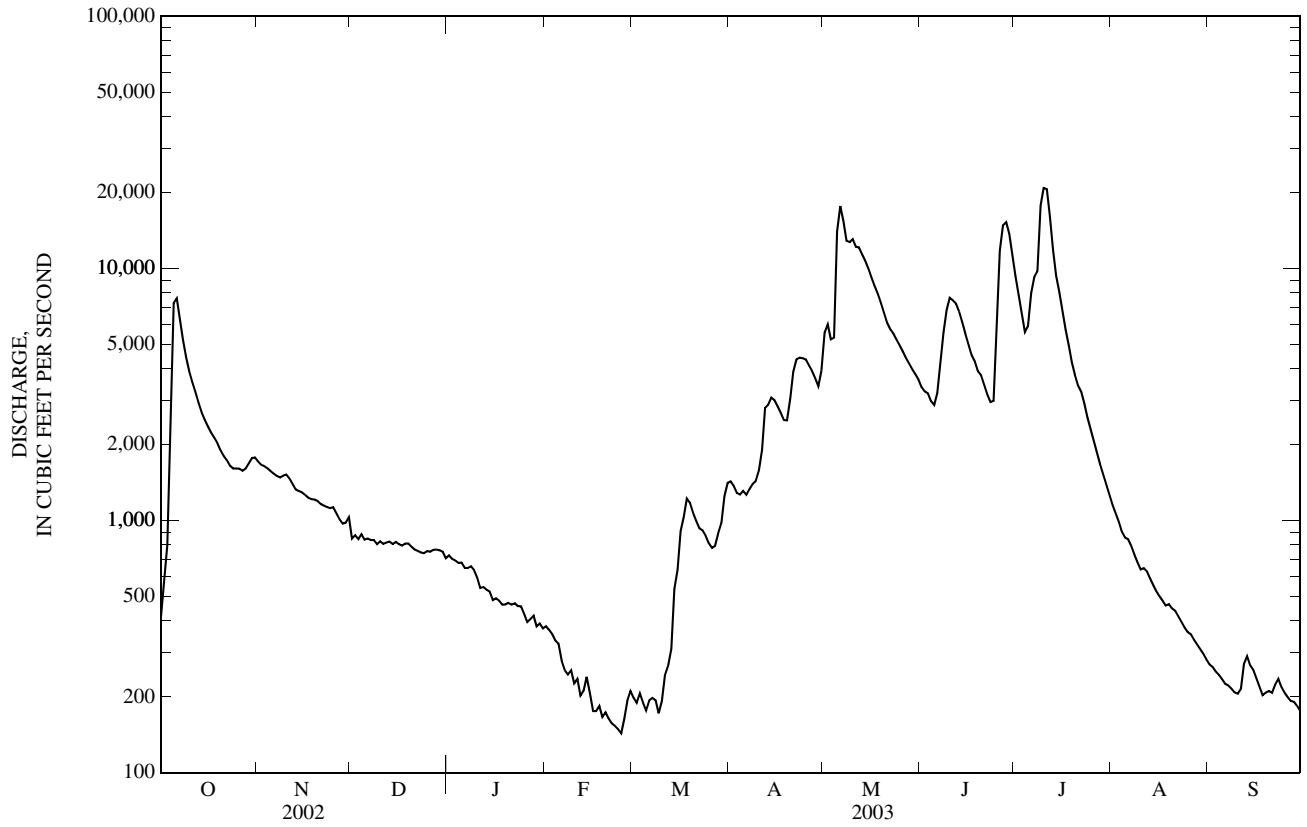
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2003, BY WATER YEAR (WY)

MEAN	1,609	1,652	1,212	735	1,230	4,151	6,534	5,751	6,040	4,374	1,961	1,266
MAX	8,763	5,745	5,267	3,267	7,061	13,920	22,020	17,120	21,310	27,250	13,500	7,546
(WY)	(1987)	(1993)	(1983)	(1992)	(1984)	(1983)	(1993)	(2001)	(1993)	(1993)	(1993)	(1993)
MIN	69.4	96.3	44.4	18.7	57.7	204	348	296	177	156	122	69.5
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1968)	(2000)	(1968)	(1977)	(1977)	(1976)	(1976)

05481300 DES MOINES RIVER NEAR STRATFORD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1968 - 2003	
ANNUAL TOTAL	594,844		952,614			
ANNUAL MEAN	1,630		2,610		3,047	
HIGHEST ANNUAL MEAN					10,400	1993
LOWEST ANNUAL MEAN					254	1977
HIGHEST DAILY MEAN	7,670	Aug 14	20,900	Jul 10	41,400	Apr 2, 1993
LOWEST DAILY MEAN	304	Aug 3	143	Feb 25a	13	Jan 23, 1977b
ANNUAL SEVEN-DAY MINIMUM	342	Jul 29	157	Feb 20	14	Jan 22, 1977
MAXIMUM PEAK FLOW			21,200	Jul 10	423,000	Apr 2, 1993
MAXIMUM PEAK STAGE			18.65	Jul 10	25.68	Apr 2, 1993
INSTANTANEOUS LOW FLOW					13	Jan 23, 1977
ANNUAL RUNOFF (AC-FT)	1,180,000		1,890,000		2,208,000	
ANNUAL RUNOFF (CFSM)	0.30		0.48		0.56	
ANNUAL RUNOFF (INCHES)	4.06		6.50		7.59	
10 PERCENT EXCEEDS	3,490		7,270		8,370	
50 PERCENT EXCEEDS	1,050		1,070		1,300	
90 PERCENT EXCEEDS	526		211		190	

a Ice affected.
b Also Jan. 24, 1977.
e Estimated.



05481630 SAYLORVILLE LAKE NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°42'13", long 93°41'21", in SE $^1/_4$ SW $^1/_4$ sec.30, T.80 N., R.24 W., Polk County, Hydrologic Unit 07100004, in control tower of Saylorville Dam, 3.2 mi northwest of Saylorville, 4.2 mi upstream from Beaver Creek, and at mile 213.7.

DRAINAGE AREA.--5,823 mi^2.

PERIOD OF RECORD.--April 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is at NGVD 0f 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1976. Storage began in April 1977. Release controlled at intake structure to forechamber of 22 ft diameter concrete conduit through dam. Ungated chute spillway 430 ft in length at right end of dam at elevation 884 ft, contents, 570,000 acre-ft. Conservation pool at elevation 836 ft, contents, 90,000 acre-ft, surface area, 5,950 acres. Flood pool elevation at 890 ft, contents, 586,000 acre-ft, surface area, 16,700 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage. Prior to October 1, 2000 published as contents in acre feet, and as elevation in feet NGVD thereafter.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

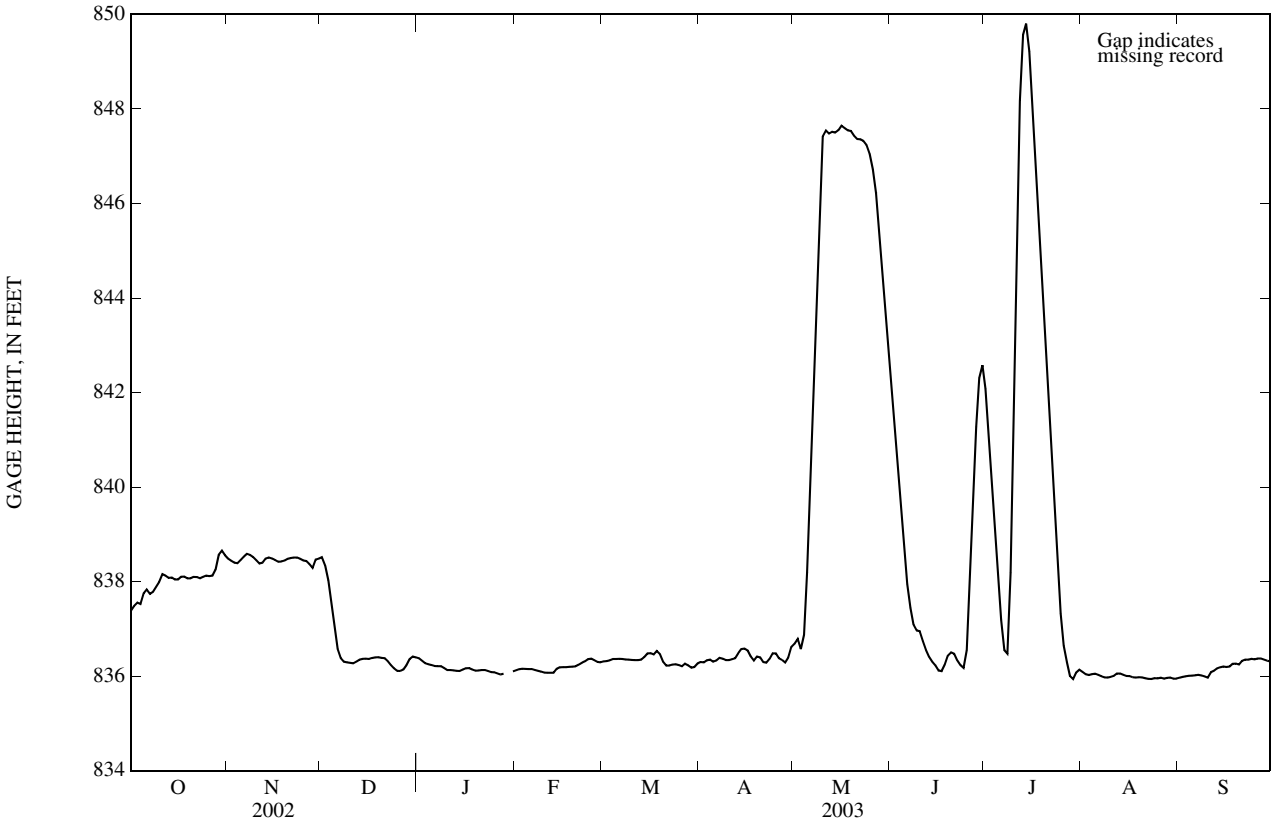
EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 892.03 ft July 13, 1993; minimum elevation, 832.61 ft Jan. 19, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 849.81 ft July 14; minimum elevation, 835.93 ft July 29.

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY OBSERVATION AT 0600 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	837.26	838.53	838.47	836.39	836.10	836.29	836.29	836.68	842.72	842.60	836.14	835.95
2	837.43	838.47	838.53	836.37	836.13	836.32	836.30	836.69	841.68	841.90	836.07	835.97
3	837.51	838.43	838.28	836.31	836.15	836.32	836.29	836.82	840.81	840.63	836.03	835.99
4	837.57	838.39	837.94	836.26	836.16	836.34	836.35	836.49	839.88	839.48	836.02	836.00
5	837.51	838.39	837.42	836.25	836.15	836.37	836.35	837.00	839.17	838.59	836.05	836.01
6	837.83	838.48	836.90	836.23	836.15	836.36	836.29	838.59	838.45	837.76	836.05	836.01
7	837.83	838.54	836.47	836.21	836.15	836.37	836.34	841.45	837.78	837.00	836.02	836.02
8	837.71	838.60	836.35	836.21	836.12	836.36	836.40	843.57	837.33	836.40	835.99	836.03
9	837.81	838.55	836.29	836.21	836.11	836.35	836.36	844.98	837.01	836.50	835.97	836.01
10	837.92	838.51	836.29	836.16	836.09	836.35	836.33	846.48	836.95	838.75	835.97	835.99
11	838.02	838.43	836.28	836.12	836.07	836.34	836.34	847.73	836.95	842.08	835.99	835.96
12	838.20	838.37	836.27	836.13	836.07	836.34	836.36	847.48	836.67	846.13	836.01	836.12
13	838.10	838.41	836.32	836.12	836.07	836.34	836.38	847.48	836.51	848.85	836.07	836.11
14	838.07	838.51	836.36	836.11	836.07	836.35	836.52	847.53	836.37	849.81	836.05	836.18
15	838.09	838.51	836.37	836.11	836.18	836.42	836.59	847.49	836.28	849.80	836.02	836.19
16	838.03	838.48	836.37	836.15	836.19	836.50	836.58	847.57	836.21	849.02	836.00	836.21
17	838.05	838.45	836.36	836.17	836.19	836.48	836.53	847.67	836.09	847.88	836.00	836.19
18	838.12	838.41	836.39	836.17	836.19	836.45	836.38	847.57	836.11	846.50	835.97	836.21
19	838.10	838.43	836.40	836.13	836.20	836.56	836.31	847.54	836.29	845.15	835.97	836.28
20	838.06	838.45	836.40	836.11	836.20	836.43	836.45	847.53	836.48	843.75	835.98	836.26
21	838.07	838.49	836.38	836.12	836.21	836.26	836.38	847.40	836.51	842.42	835.97	836.24
22	838.11	838.50	836.38	836.13	836.25	836.21	836.27	847.35	836.46	841.19	835.95	836.35
23	838.09	838.51	836.30	836.13	836.29	836.23	836.29	847.36	836.29	839.97	835.94	836.35
24	838.06	838.51	836.21	836.10	836.32	836.25	836.39	847.31	836.21	838.93	835.94	836.35
25	838.11	838.47	836.15	836.08	836.37	836.25	836.51	847.21	836.16	837.96	835.96	836.37
26	838.13	838.44	836.10	836.08	836.37	836.23	836.47	847.00	836.68	837.11	835.95	836.35
27	838.11	838.43	836.11	836.05	836.33	836.20	836.35	846.63	838.14	836.49	835.97	836.38
28	838.13	838.35	836.15	836.03	836.29	836.28	836.34	846.08	840.03	836.23	835.94	836.37
29	838.29	838.27	836.26	836.06	---	836.21	836.27	845.40	841.69	835.93	835.97	836.34
30	838.66	838.53	836.39	---	---	836.17	836.44	844.60	842.51	835.94	835.97	836.32
31	838.65	---	836.42	836.09	---	836.20	---	843.78	---	836.12	835.94	---
MEAN	837.99	838.46	836.62	---	836.18	836.33	836.38	844.66	837.88	841.19	836.00	836.17
MAX	838.66	838.60	838.53	---	836.37	836.56	836.59	847.73	842.72	849.81	836.14	836.38
MIN	837.26	838.27	836.10	---	836.07	836.17	836.27	836.49	836.09	835.93	835.94	835.95

05481630 SAYLORVILLE LAKE NEAR SAYLORVILLE, IA—Continued



05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°40'50", long 93°40'05", SW¼ NE¼ NE¼ sec.5, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, on left bank 5 ft upstream of Fisher Bridge on county highway R6F, 2.0 mi west of Saylorville, 2.1 mi downstream from Rock Creek, 2.3 mi downstream from Saylorville Dam, 2.3 mi upstream from Beaver Creek, and at mile 211.4.

DRAINAGE AREA.--5,841 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 787.42 ft above NGVD of 1929 (levels by U. S. Army Corps of Engineers). Prior to Aug. 6, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by Saylorville Lake (Station 05481630) 2.3 mi upstream since Apr. 12, 1977. U.S. Army Corps of Engineers satellite data collection platform and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,400 ft^3/s Apr. 10, 1965, gage height, 24.02 ft; minimum daily discharge, 13 ft^3/s Jan. 25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, 24.5 ft June 24, 1954, from floodmarks, discharge, 60,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	326	1,960	676	828	344	219	1,270	5,050	6,660	12,800	1,530	217
2	336	1,820	1,050	828	e353	218	1,430	5,600	6,350	12,600	1,410	197
3	439	1,810	1,480	761	e341	218	1,320	5,990	6,040	11,700	1,180	199
4	1,200	1,690	1,980	716	330	212	1,200	6,300	5,540	9,910	1,030	201
5	3,110	1,440	1,980	715	332	210	1,200	6,230	5,080	9,160	955	201
6	6,190	1,350	1,810	716	329	210	1,200	7,940	5,070	9,630	993	202
7	7,140	1,350	1,280	719	319	210	1,190	10,100	5,050	10,300	991	200
8	5,910	1,580	898	720	311	208	1,310	10,600	5,610	10,500	928	198
9	4,590	1,740	896	719	306	206	1,400	9,670	6,430	11,000	837	198
10	3,950	1,740	907	647	300	204	1,400	9,380	7,180	12,200	750	198
11	3,530	1,610	907	483	251	206	1,480	11,800	8,120	11,900	723	200
12	3,380	1,300	914	419	216	209	1,890	12,700	8,050	11,200	570	198
13	3,210	1,130	917	432	214	221	2,470	e11,700	7,560	11,500	660	198
14	2,960	1,240	922	425	217	245	2,880	e11,800	6,910	11,100	745	198
15	2,720	1,320	930	419	216	361	3,020	11,000	6,260	11,600	698	199
16	2,470	1,320	932	411	219	665	3,000	9,620	5,730	12,100	617	200
17	2,260	1,320	940	401	224	912	2,980	9,100	5,190	11,900	585	200
18	2,200	1,210	943	385	230	1,060	2,760	8,490	4,430	10,800	537	198
19	2,200	1,110	942	397	232	1,660	2,440	7,760	3,660	9,920	500	197
20	2,020	1,100	943	352	236	1,820	2,680	7,140	3,770	9,090	502	197
21	1,890	1,100	942	301	242	1,240	3,230	6,410	3,870	8,230	495	200
22	1,880	1,110	943	289	244	956	3,710	5,770	3,850	7,200	455	198
23	1,880	1,120	939	297	237	885	3,870	5,520	3,620	6,580	390	198
24	1,760	1,110	818	e260	220	878	4,010	5,510	3,270	5,940	369	198
25	1,670	1,120	800	266	287	872	4,210	5,500	3,130	5,170	372	197
26	1,660	1,090	709	279	353	869	4,330	5,740	4,670	4,340	374	197
27	1,660	973	546	332	353	866	4,050	6,120	7,500	3,450	373	197
28	1,530	952	482	307	276	859	3,830	6,410	10,400	2,880	331	197
29	605	754	485	277	---	853	3,580	6,560	12,400	2,140	295	197
30	1,230	680	670	279	---	856	4,190	6,680	12,800	1,380	290	198
31	2,140	---	828	308	---	970	---	6,730	---	1,380	262	---
TOTAL	78,046	39,149	30,409	14,688	7,732	19,578	77,530	244,920	184,200	269,600	20,747	5,973
MEAN	2,518	1,305	981	474	276	632	2,584	7,901	6,140	8,697	669	199
MAX	7,140	1,960	1,980	828	353	1,820	4,330	12,700	12,800	12,800	1,530	217
MIN	326	680	482	260	214	204	1,190	5,050	3,130	1,380	262	197
AC-FT	154,800	77,650	60,320	29,130	15,340	38,830	153,800	485,800	365,400	534,800	41,150	11,850
CFSM	0.43	0.22	0.17	0.08	0.05	0.11	0.44	1.35	1.05	1.49	0.11	0.03
IN.	0.50	0.25	0.19	0.09	0.05	0.12	0.49	1.56	1.17	1.72	0.13	0.04

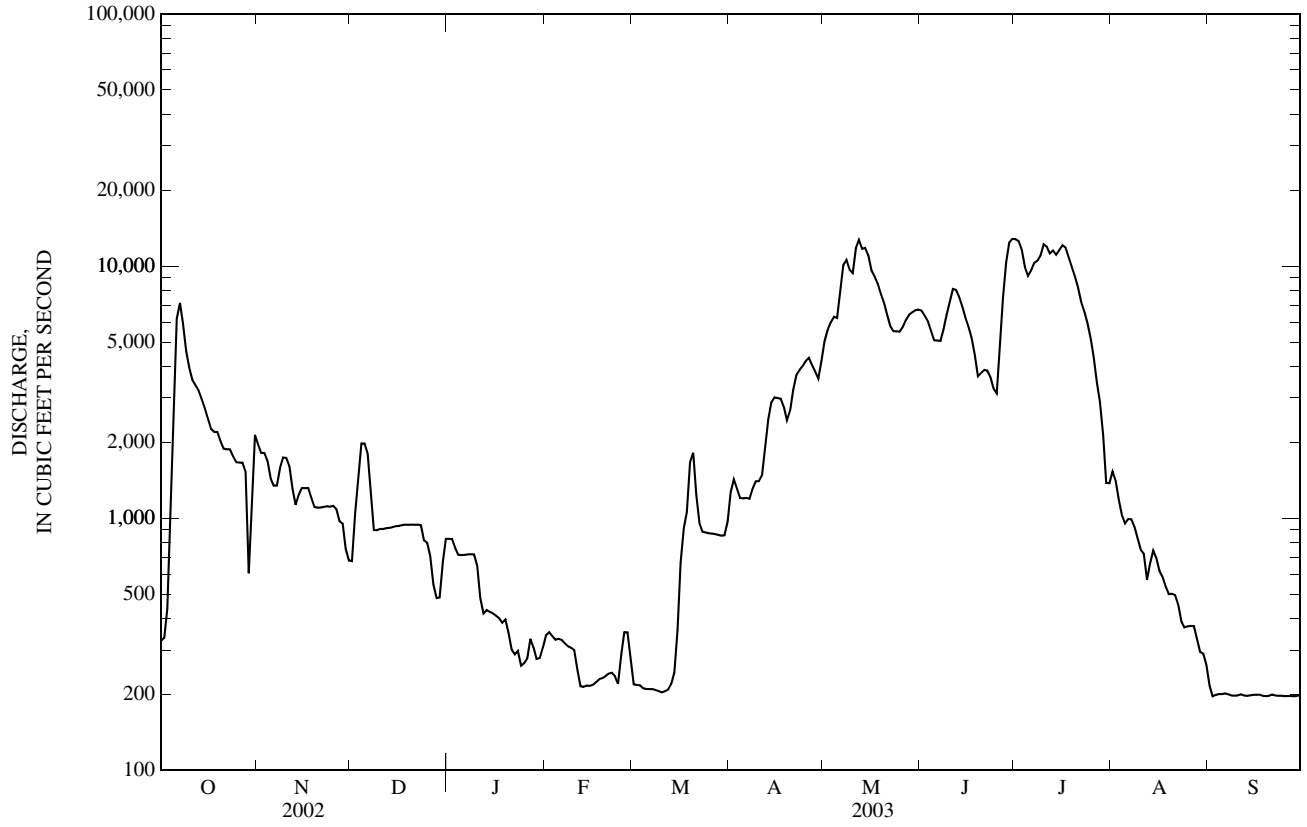
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	1,742	1,980	1,637	904	1,478	4,176	6,771	6,634	7,108	6,476	3,028	1,931
MAX	7,161	6,210	5,345	3,605	6,591	13,800	17,790	18,170	19,540	32,820	15,440	13,450
(WY)	(1987)	(1987)	(1983)	(1983)	(1984)	(1983)	(1993)	(1993)	(1991)	(1993)	(1993)	(1993)
MIN	194	190	205	190	204	362	365	741	877	254	212	199
(WY)	(1990)	(1990)	(1990)	(1991)	(2000)	(1981)	(2000)	(2000)	(1988)	(1988)	(1989)	(2003)

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1978 - 2003a	
ANNUAL TOTAL	635,292		992,572			
ANNUAL MEAN	1,741		2,719		3,663	
HIGHEST ANNUAL MEAN					11,320	1993
LOWEST ANNUAL MEAN					487	1989
HIGHEST DAILY MEAN	7,140	Oct 7	12,800	Jun 30	44,300	Jul 21, 1993
LOWEST DAILY MEAN	196	Sep 24	197	Sep 2b	144	Nov 29, 1977
ANNUAL SEVEN-DAY MINIMUM	225	Sep 21	197	Sep 23	165	Mar 5, 1978
MAXIMUM PEAK FLOW			13,500	May 12	45,700	Jul 21, 1993
MAXIMUM PEAK STAGE			13.20	May 12	24.22	Jul 21, 1993
ANNUAL RUNOFF (AC-FT)	1,260,000		1,969,000		2,654,000	
ANNUAL RUNOFF (CFSM)	0.30		0.47		0.63	
ANNUAL RUNOFF (INCHES)	4.05		6.32		8.52	
10 PERCENT EXCEEDS	3,760		8,160		10,900	
50 PERCENT EXCEEDS	1,160		1,110		1,800	
90 PERCENT EXCEEDS	464		210		232	

a Post regulation
b Also Sept. 19, 20, 25-29.
e Estimated.



05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD: October 1961 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1967 to current year.
WATER TEMPERATURES: October 1961 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1961 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis. During periods of partial ice cover, sediment samples are collected in open water channel.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,400 microsiemens Feb. 18, 1977; minimum daily, 90 microsiemens Feb. 19, 1971.
WATER TEMPERATURES: Maximum daily, 36.0°C June 29, 1971; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 5,400 mg/L May 14, 1970; minimum daily mean, 1 mg/L Jan. 8, 1965, Sept. 1, 1988, Feb. 9, July 8, 1990, Dec. 4, 5, and Dec. 9, 2000.
SEDIMENT LOADS: Maximum daily, 148,000 tons June 12, 1966; minimum daily, 0.56 tons Sept. 1, 1988.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 891 microsiemens Feb. 13; minimum daily, 513 microsiemens July 2.
WATER TEMPERATURES: Maximum daily, 29.5°C Aug. 18; minimum daily, 0.0°C Feb. 4.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 226 mg/L May 16; minimum daily mean, 2.0 mg/L Dec. 10.
SEDIMENT LOADS: Maximum daily, 5,870 tons May 16; minimum daily, 5.5 tons Feb. 1.

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	555	620	---	878	687	736	643	625	590	547	514
2	568	---	672	---	677	---	---	552	657	513	617	587
3	592	---	691	614	701	678	605	576	573	593	551	580
4	592	610	---	611	642	---	629	618	630	---	623	593
5	592	678	581	---	640	---	647	675	641	---	557	585
6	591	698	624	647	---	---	684	577	606	618	550	---
7	591	683	623	639	---	657	---	600	740	567	618	---
8	586	576	580	681	634	653	569	572	589	673	611	582
9	595	689	602	602	---	---	666	627	621	536	610	592
10	623	609	566	---	---	---	632	604	626	525	515	593
11	647	---	---	---	698	669	682	605	646	617	609	604
12	603	689	593	609	---	670	638	627	619	---	595	---
13	---	638	662	620	891	670	607	612	---	534	595	---
14	---	687	576	---	768	684	627	640	576	569	537	593
15	590	---	609	---	---	---	633	644	588	591	587	591
16	529	693	654	---	---	---	612	589	561	591	563	591
17	576	---	686	---	676	---	622	640	634	532	585	593
18	560	698	617	---	664	684	624	541	585	573	572	594
19	---	574	714	614	675	---	---	626	572	---	585	---
20	---	552	596	604	651	---	620	---	567	---	589	599
21	---	589	592	---	651	698	620	534	566	---	576	---
22	---	556	---	---	663	613	627	558	578	---	581	600
23	566	645	605	---	---	641	627	542	608	---	---	599
24	584	624	---	---	---	631	607	---	675	---	545	596
25	556	---	---	---	---	685	625	595	577	---	581	603
26	543	571	676	---	---	646	625	583	654	---	578	601
27	---	601	601	---	746	665	538	557	681	554	581	598
28	531	---	673	---	731	657	599	560	641	545	---	600
29	548	554	654	---	---	626	546	553	543	531	575	605
30	516	568	589	671	---	607	628	587	606	522	---	---
31	549	---	612	691	---	589	---	559	---	550	575	---

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	5.0	3.5	12.5	15.0	19.0	24.0	25.0	23.0
2	19.0	---	---	---	4.5	---	---	15.0	18.0	24.0	25.5	28.0
3	20.0	---	---	---	3.0	4.5	8.5	15.0	18.0	25.0	25.5	24.0
4	19.0	---	---	---	0.0	---	7.0	14.0	18.5	---	28.0	23.0
5	17.0	---	---	---	2.5	---	6.0	14.5	19.0	---	27.0	22.0
6	18.0	---	---	---	---	---	1.5	15.0	20.5	24.0	26.5	---
7	15.0	---	---	---	---	5.0	---	15.0	20.5	27.0	28.5	---
8	18.0	---	---	---	3.0	1.5	8.0	14.0	18.0	26.5	26.0	24.5
9	19.0	---	---	---	---	---	8.0	15.0	21.0	25.0	26.5	24.0
10	15.5	---	---	---	---	---	8.5	15.5	20.0	23.5	27.0	24.0
11	15.5	---	---	---	4.0	8.0	10.0	13.5	20.5	25.5	26.5	27.0
12	15.0	---	---	---	---	5.0	9.0	13.0	20.5	---	28.0	---
13	---	---	---	---	3.0	8.0	14.0	14.0	---	25.0	25.0	---
14	---	---	---	---	3.0	4.0	14.0	16.5	25.5	23.0	28.0	19.0
15	13.5	---	---	---	---	---	14.0	15.0	23.0	24.0	28.0	20.5
16	13.0	---	---	---	---	---	14.0	15.0	25.0	24.0	28.5	22.0
17	11.0	---	---	---	5.5	---	13.5	16.5	24.0	25.5	29.0	22.0
18	15.0	---	2.0	---	4.0	10.0	12.5	17.0	24.5	24.5	29.5	22.0
19	---	4.0	---	---	5.0	---	---	18.0	25.0	---	28.0	---
20	---	---	---	---	9.0	---	13.0	---	23.0	---	29.0	19.5
21	---	---	---	---	8.0	5.0	13.0	18.0	25.0	---	28.0	---
22	---	---	---	---	3.0	7.5	15.0	18.5	24.0	---	26.0	19.0
23	9.0	---	---	---	---	8.5	14.0	19.0	24.5	---	---	17.0
24	8.0	---	---	---	---	8.0	12.0	---	28.0	---	27.0	20.0
25	8.5	---	---	---	---	6.0	13.5	21.0	26.0	---	26.0	18.0
26	9.0	---	---	---	---	8.0	16.0	20.5	24.0	---	27.0	17.0
27	---	---	---	---	3.0	7.0	18.0	22.0	24.0	25.0	27.0	18.0
28	8.0	---	---	---	1.0	5.5	17.0	20.0	25.0	26.0	---	14.0
29	9.0	---	---	---	---	5.5	15.0	19.0	25.0	27.5	27.0	12.0
30	---	---	---	4.5	---	8.0	14.0	20.0	23.0	24.5	---	---
31	---	---	---	3.0	---	8.0	---	19.0	---	27.0	23.5	---

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

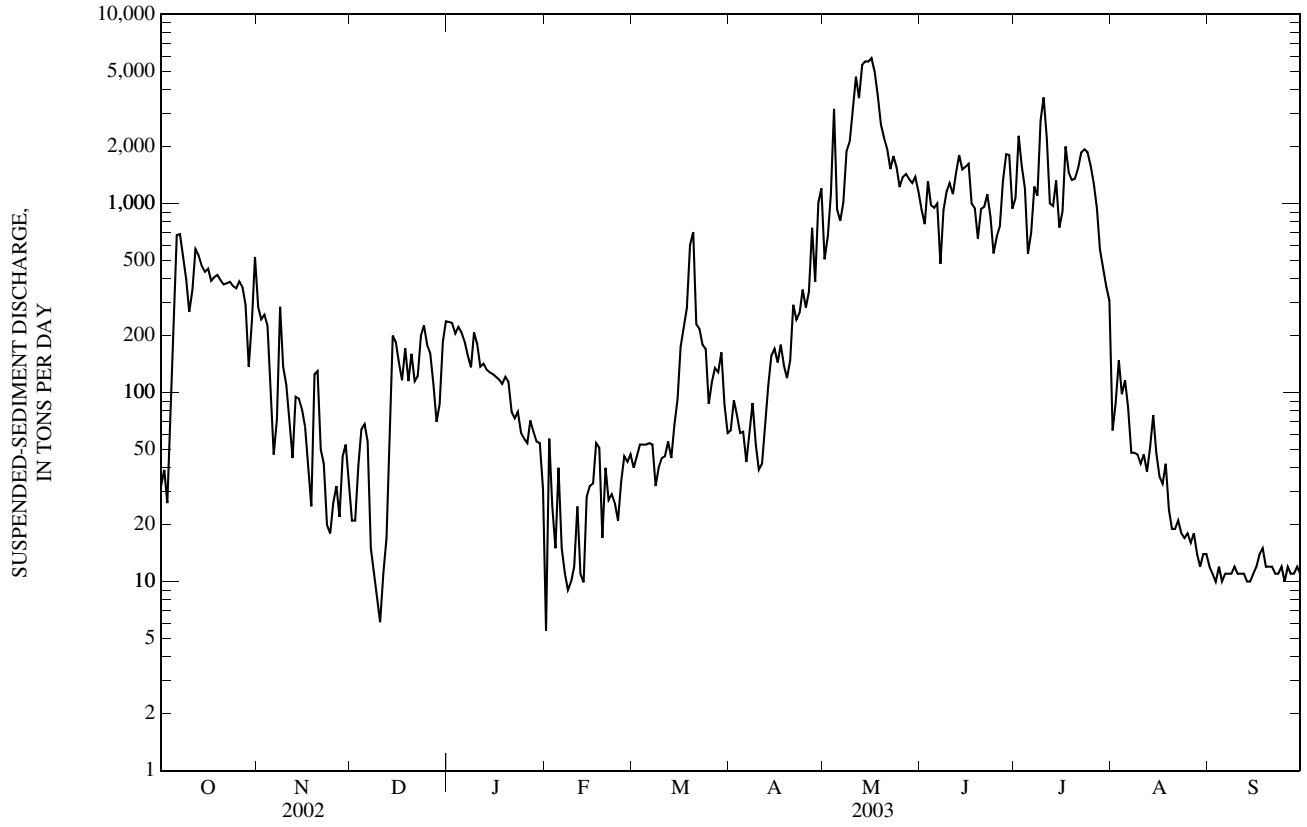
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	36	32	53	283	11	21	106	236	6	5.5	68	40
2	43	39	50	244	7	21	104	233	60	57	79	46
3	23	26	53	258	10	41	100	205	27	25	91	53
4	26	87	49	227	12	64	115	222	17	15	93	53
5	34	302	24	96	13	68	108	208	45	40	94	53
6	40	678	13	47	11	55	96	185	17	15	94	54
7	36	688	20	72	4	15	81	157	13	11	93	53
8	32	517	66	284	4	11	70	136	11	9.0	57	32
9	32	397	29	137	3	8.0	107	208	12	10	71	40
10	25	267	23	109	2	6.1	103	180	14	12	82	45
11	37	349	17	74	4	11	106	137	38	25	82	46
12	63	574	13	45	7	17	125	142	19	11	97	55
13	61	531	31	95	18	45	114	132	17	9.9	75	45
14	58	466	28	93	80	200	112	128	48	28	101	67
15	59	435	23	82	74	185	110	125	54	32	94	92
16	68	452	19	66	57	143	109	121	56	33	98	174
17	64	390	11	41	46	116	108	117	89	54	90	220
18	69	407	8	25	67	171	106	111	82	51	97	279
19	70	418	42	125	45	115	113	121	27	17	128	602
20	72	392	44	130	63	160	118	114	62	40	139	705
21	73	373	17	50	45	115	97	79	41	27	66	230
22	75	378	14	42	48	122	94	73	44	29	85	217
23	76	385	7	20	79	199	98	79	41	26	75	179
24	77	366	6	18	102	226	87	61	35	21	72	170
25	79	355	9	26	86	179	79	57	41	34	37	87
26	86	386	11	32	82	162	71	54	48	46	48	114
27	80	360	8	22	73	111	79	71	45	43	58	135
28	71	290	18	46	54	70	75	62	64	47	55	128
29	84	137	26	53	66	87	73	55	---	---	71	163
30	70	241	18	33	101	185	72	54	---	---	38	87
31	90	521	---	---	107	238	39	31	---	---	24	61
TOTAL	---	11,239	---	2,875	---	3,167.1	---	3,894	---	773.4	---	4,325

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	18	63	37	506	52	929	31	1,060	15	63	20	12
2	24	91	44	668	46	778	67	2,280	24	88	20	11
3	21	76	68	1,110	80	1,310	50	1,580	46	148	19	10
4	19	61	185	3,160	66	981	44	1,200	35	98	22	12
5	19	62	55	931	69	948	22	543	45	116	19	10
6	13	43	39	808	73	1,000	26	698	31	83	20	11
7	19	63	37	1,010	35	480	44	1,230	18	48	20	11
8	25	88	66	1,880	61	922	39	1,100	19	48	21	11
9	14	53	83	2,120	67	1,160	92	2,750	21	47	22	12
10	10	39	123	3,090	67	1,280	110	3,630	21	42	20	11
11	10	42	148	4,680	51	1,120	66	2,200	24	47	21	11
12	13	66	105	3,600	67	1,460	33	999	25	38	20	11
13	16	109	171	5,400	88	1,800	31	969	28	51	19	10
14	20	156	177	5,640	81	1,510	44	1,320	38	76	19	10
15	21	170	191	5,630	93	1,560	24	747	25	48	21	11
16	18	144	226	5,870	104	1,620	28	909	21	36	22	12
17	22	179	202	4,970	71	1,000	63	2,000	21	33	25	14
18	19	139	160	3,680	78	942	50	1,460	29	42	29	15
19	18	119	125	2,620	66	652	50	1,330	18	24	23	12
20	20	148	115	2,220	92	936	55	1,350	14	19	22	12
21	33	291	113	1,950	92	962	69	1,530	14	19	21	12
22	24	243	98	1,520	108	1,120	96	1,860	17	21	21	11
23	25	264	120	1,780	86	845	109	1,930	17	18	20	11
24	32	350	104	1,550	62	544	117	1,870	17	17	22	12
25	25	281	82	1,220	79	666	113	1,580	18	18	19	10
26	29	341	89	1,380	60	752	109	1,280	16	16	22	12
27	68	744	87	1,430	65	1,320	101	942	17	18	20	11
28	37	385	78	1,350	66	1,820	73	569	16	14	20	11
29	107	1,010	72	1,280	54	1,800	79	451	15	12	22	12
30	113	1,200	77	1,380	27	938	98	365	17	14	20	11
31	---	---	63	1,150	---	---	86	306	20	14	---	---
TOTAL	---	7,020	---	75,583	---	33,155	---	42,038	---	1,376	---	342
YEAR	185,787.5											

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05481950 BEAVER CREEK NEAR GRIMES, IA

LOCATION.--Lat 41°41'18", long 93°44'06", in SW¼ SW¼ sec.35, T.80 N., R.25 W., Polk County, Hydrologic Unit 07100004, on left bank 10 ft upstream from bridge on Northwest 70th Avenue, 0.5 mi downstream from Little Beaver Creek, 2.5 mi east of Grimes, and 6 mi upstream from mouth.

DRAINAGE AREA.--358 mi^2.

PERIOD OF RECORD.--April 1960 to current year.

REVISED RECORDS.--WDR IA-77-1: 1974 (P), WDR IA-95-1:location.

GAGE.--Water stage recorder. Datum of gage is 806.98 ft above NGVD of 1929. Prior to Aug. 31, 1966, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.49	36	16	e21	e13	e11	41	905	219	408	88	1.3
2	9.7	36	e22	e29	e14	e3.7	41	811	215	325	78	1.1
3	4.9	35	e21	e24	e11	e5.3	41	598	228	277	69	0.89
4	6.5	33	e19	e5.9	e9.4	e4.4	42	1,070	221	240	61	0.71
5	14	35	e17	e3.9	e8.9	e2.6	43	2,170	214	288	57	0.65
6	68	35	e16	e4.7	e6.9	e16	44	2,780	228	318	50	0.64
7	92	33	e18	e19	e3.7	e22	46	2,020	252	399	46	0.48
8	74	32	e22	e14	e11	e17	46	1,470	309	363	42	0.43
9	59	30	e20	e16	e9.6	e14	46	1,680	311	646	e39	0.40
10	49	30	e26	e12	e11	e21	50	1,970	352	1,210	35	0.39
11	41	29	e19	e9.3	e10	e37	58	1,220	334	1,750	34	0.62
12	37	27	e17	e7.6	e9.2	e46	74	834	305	2,420	32	5.6
13	34	24	33	e9.0	e13	e48	82	675	284	1,870	31	4.0
14	33	19	34	e6.6	e18	e52	78	850	260	859	28	3.7
15	34	17	26	e4.5	e14	e61	73	1,120	244	589	24	3.0
16	31	20	18	e3.3	e11	e68	71	940	233	472	19	3.2
17	31	17	17	e2.3	e5.7	e90	71	724	219	390	17	2.1
18	30	18	21	e2.2	e17	105	69	598	225	330	14	1.5
19	25	16	25	e1.6	e15	85	78	527	226	283	11	2.5
20	21	17	e27	e5.2	e19	65	91	468	206	248	9.2	1.9
21	19	16	e18	e3.0	e17	53	130	416	191	222	7.3	3.9
22	17	15	e23	e2.1	e15	47	193	388	184	193	6.0	6.6
23	17	14	e20	e1.4	e9.6	42	e169	364	176	167	5.0	5.2
24	20	13	e8.5	e5.1	e5.5	38	e157	342	166	149	4.2	5.9
25	29	12	e8.0	e3.9	e2.9	36	153	323	165	134	3.5	3.5
26	28	15	e10	e1.9	e6.3	35	160	303	288	119	2.9	2.4
27	23	e20	e8.6	e5.4	e9.2	36	167	285	284	105	2.5	2.6
28	28	e13	e10	e10	e10	37	162	275	535	103	2.2	1.9
29	26	17	15	e6.3	---	38	151	260	684	145	2.0	1.6
30	27	e21	14	e11	---	40	669	249	557	116	1.5	1.2
31	31	---	e22	e13	---	42	---	233	---	100	1.4	---
TOTAL	959.59	695	591.1	264.2	305.9	1,218.0	3,296	26,868	8,315	15,238	822.7	69.91
MEAN	31.0	23.2	19.1	8.52	10.9	39.3	110	867	277	492	26.5	2.33
MAX	92	36	34	29	19	105	669	2,780	684	2,420	88	6.6
MIN	0.49	12	8.0	1.4	2.9	2.6	41	233	165	100	1.4	0.39
AC-FT	1,900	1,380	1,170	524	607	2,420	6,540	53,290	16,490	30,220	1,630	139
CFSM	0.09	0.06	0.05	0.02	0.03	0.11	0.31	2.42	0.77	1.37	0.07	0.01
IN.	0.10	0.07	0.06	0.03	0.03	0.13	0.34	2.79	0.86	1.58	0.09	0.01

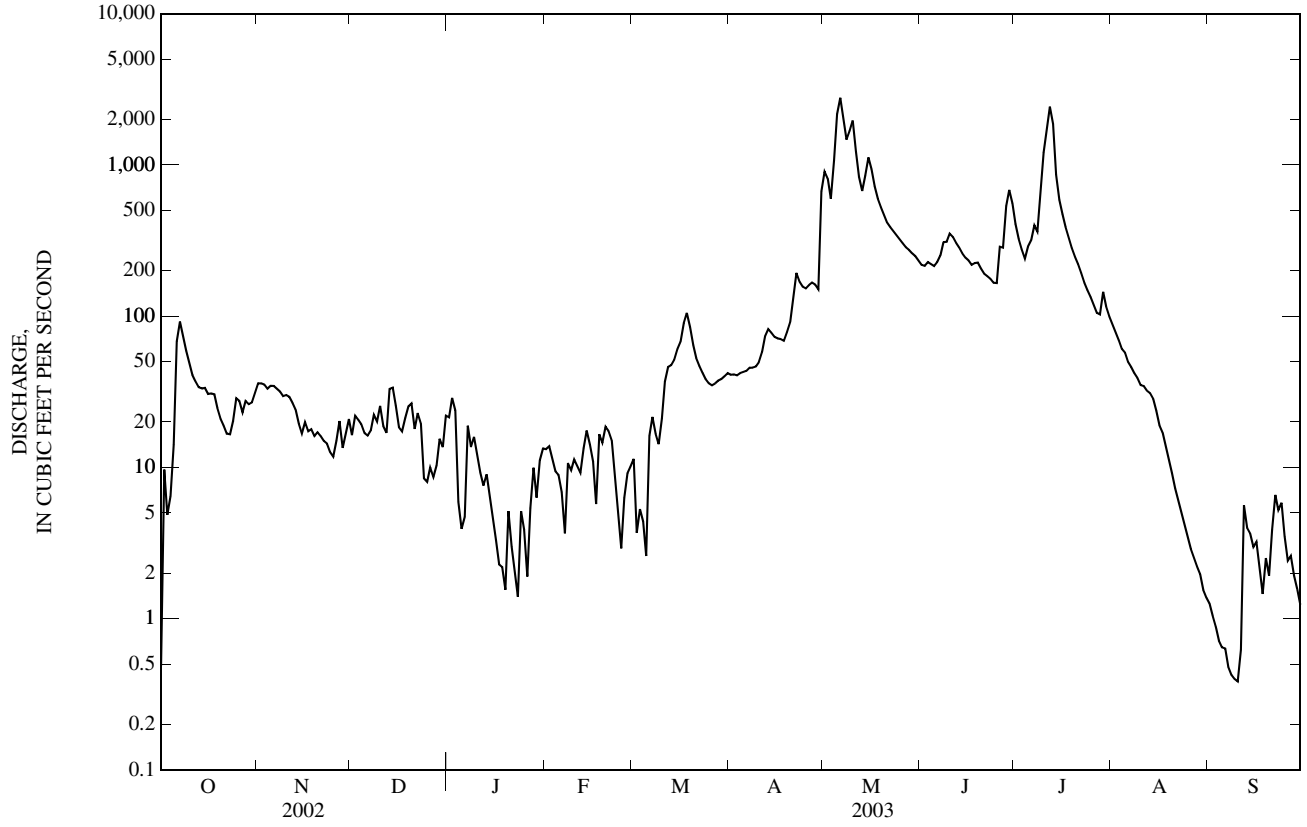
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2003, BY WATER YEAR (WY)

MEAN	94.8	112	94.0	58.2	117	337	369	431	463	282	104	68.3
MAX	724	655	486	305	526	1,171	1,275	1,419	1,434	2,160	695	654
(WY)	(1974)	(1973)	(1983)	(1974)	(1973)	(1979)	(1965)	(1974)	(1998)	(1993)	(1993)	(1993)
MIN	0.058	0.63	0.77	0.002	0.35	3.98	3.26	1.11	1.41	0.24	0.73	0.26
(WY)	(1989)	(1967)	(1977)	(1977)	(1977)	(1981)	(1981)	(1981)	(1977)	(1977)	(1988)	(1988)

05481950 BEAVER CREEK NEAR GRIMES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1961 - 2003	
ANNUAL TOTAL	24,995.31		58,643.40			
ANNUAL MEAN	68.5		161		211	
HIGHEST ANNUAL MEAN					575	1993
LOWEST ANNUAL MEAN					17.3	1981
HIGHEST DAILY MEAN	853	May 13	2,780	May 6	11,500	Jul 10, 1993
LOWEST DAILY MEAN	0.37	Sep 16	0.39	Sep 10	0.00	Sep 8, 1970a
ANNUAL SEVEN-DAY MINIMUM	0.46	Sep 12	0.52	Sep 5	0.00	Oct 7, 1971
MAXIMUM PEAK FLOW			3,160	May 6	14,300	Jul 10, 1993
MAXIMUM PEAK STAGE			11.99	May 6	16.58	Jul 10, 1993
ANNUAL RUNOFF (AC-FT)	49,580		116,300		153,000	
ANNUAL RUNOFF (CFSM)	0.19		0.45		0.59	
ANNUAL RUNOFF (INCHES)	2.60		6.09		8.01	
10 PERCENT EXCEEDS	188		389		544	
50 PERCENT EXCEEDS	26		29		67	
90 PERCENT EXCEEDS	5.8		3.0		2.2	

a Also Sept. 11-13, 1970, Sept. 17, 18, Oct. 7-17, 1971, and many days during 1977.
e Estimated.



05482000 DES MOINES RIVER AT SECOND AVENUE AT DES MOINES, IA

LOCATION.--Lat 41°36'45", long 93°37'15", in NE¼ NE¼ sec.34, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, on right bank 5 ft upstream from 2nd Avenue or State Highway 60 bridge in Des Moines, 1.8 miles upstream from Des Moines Electric Company dam, 2.8 miles upstream from Raccoon River, and 4.5 miles downstream from Beaver Creek.

DRAINAGE AREA.--6,245 mi^2.

PERIOD OF RECORD.--October 1902 to August 1903, October 1914 to February 1915 (gage heights and discharge measurements only); March 1915 to September 1961, October 1996 to current year.

REVISED RECORDS-- WSP 1308: 1915-19, 1921, 1923, 1933, 1943(M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 773.68 ft above NGVD of 1929 and at city datum. Prior to August 21, 1941, staff, chain, or recording gages at several sites within 3 mi of present site at various datums.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by Saylorville Dam 6.8 mi. upstream, since Apr. 12, 1977. U.S. Army Corps of Engineers rain gage, U.S. Geological Survey satellite data collection platform, and U.S. Weather Service Limited Automated Remote Collector (LARC) at station.

EXTREMES FOR PERIOD OF RECORD--Maximum discharge 60,200 ft^3/sec on June 24, 1954, gage height 30.16; minimum unregulated daily discharge 24 ft^3/sec Jan. 29, 30, 1940.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e330	1,970	685	823	e347	e276	1,290	5,990	7,570	13,900	1,520	244
2	e345	1,770	850	820	e353	e261	1,430	6,530	7,310	13,700	1,410	221
3	e511	1,760	1,390	e769	e310	e264	1,350	6,980	6,910	12,800	1,160	213
4	e1,300	1,660	1,940	e718	e300	e258	1,210	8,040	6,430	10,900	1,030	210
5	e3,180	1,420	1,940	721	e304	e261	1,200	8,590	5,820	9,990	e964	211
6	e6,340	1,290	1,820	718	e297	e263	1,220	10,200	5,840	10,400	e1,010	209
7	7,560	1,290	1,380	725	e287	e261	1,230	12,900	5,810	11,200	e999	208
8	6,910	1,480	895	733	e284	e253	1,280	13,200	6,350	11,400	e941	203
9	5,190	1,690	906	735	e286	e255	1,390	12,800	7,270	12,000	e851	205
10	3,970	1,660	915	684	e288	e255	1,390	11,900	8,090	13,400	e768	196
11	e3,580	1,560	915	e511	e284	e255	1,460	14,000	9,070	13,800	e730	216
12	e3,440	1,300	915	e432	e252	e265	1,830	15,300	9,030	13,000	e583	233
13	e3,240	1,100	910	e436	e261	e276	2,490	13,700	8,500	13,400	e665	212
14	e3,010	1,160	912	e427	e258	e375	2,960	13,900	7,800	12,500	744	205
15	e2,750	1,260	921	e425	e250	481	3,110	13,300	7,100	12,500	716	198
16	e2,490	1,270	938	e419	e248	722	3,060	11,600	6,470	13,100	645	203
17	e2,290	1,270	935	e407	e251	1,010	3,000	10,800	5,900	12,800	599	210
18	e2,220	1,210	930	e396	e261	1,190	2,810	10,100	5,150	11,700	572	222
19	e2,210	1,120	929	e411	e259	1,680	2,510	9,190	4,170	10,800	523	220
20	e2,040	1,110	928	e362	e277	1,980	2,630	8,470	4,250	9,830	518	216
21	e1,910	1,100	921	e308	e286	1,320	3,240	7,640	4,410	8,920	508	254
22	e1,900	1,120	918	e298	e293	1,030	3,890	6,870	4,380	7,740	480	228
23	e1,890	1,120	921	e300	e300	922	4,120	6,530	4,120	7,070	434	219
24	e1,770	1,110	820	e275	e289	897	4,320	6,530	3,620	6,370	409	204
25	e1,680	1,100	680	e273	e328	898	4,480	6,500	3,520	5,590	400	198
26	e1,680	1,070	e648	e281	e381	910	4,600	6,680	4,970	4,730	392	205
27	e1,670	1,000	e565	e335	e388	895	4,390	7,070	8,160	3,630	385	204
28	e1,550	946	e500	e322	e321	873	4,100	7,400	11,300	2,930	367	200
29	e641	812	e503	e283	---	874	3,800	7,550	13,600	2,320	321	205
30	e1,250	640	651	e296	---	868	5,040	7,650	14,100	1,440	305	216
31	e2,150	---	834	e317	---	935	---	7,670	---	1,370	295	---
TOTAL	80,997	38,368	29,915	14,960	8,243	21,263	80,830	295,580	207,020	295,230	21,244	6,388
MEAN	2,613	1,279	965	483	294	686	2,694	9,535	6,901	9,524	685	213
MAX	7,560	1,970	1,940	823	388	1,980	5,040	15,300	14,100	13,900	1,520	254
MIN	330	640	500	273	248	253	1,200	5,990	3,520	1,370	295	196
AC-FT	160,700	76,100	59,340	29,670	16,350	42,180	160,300	586,300	410,600	585,600	42,140	12,670
CFSM	0.42	0.20	0.15	0.08	0.05	0.11	0.43	1.53	1.10	1.52	0.11	0.03
IN.	0.48	0.23	0.18	0.09	0.05	0.13	0.48	1.76	1.23	1.76	0.13	0.04

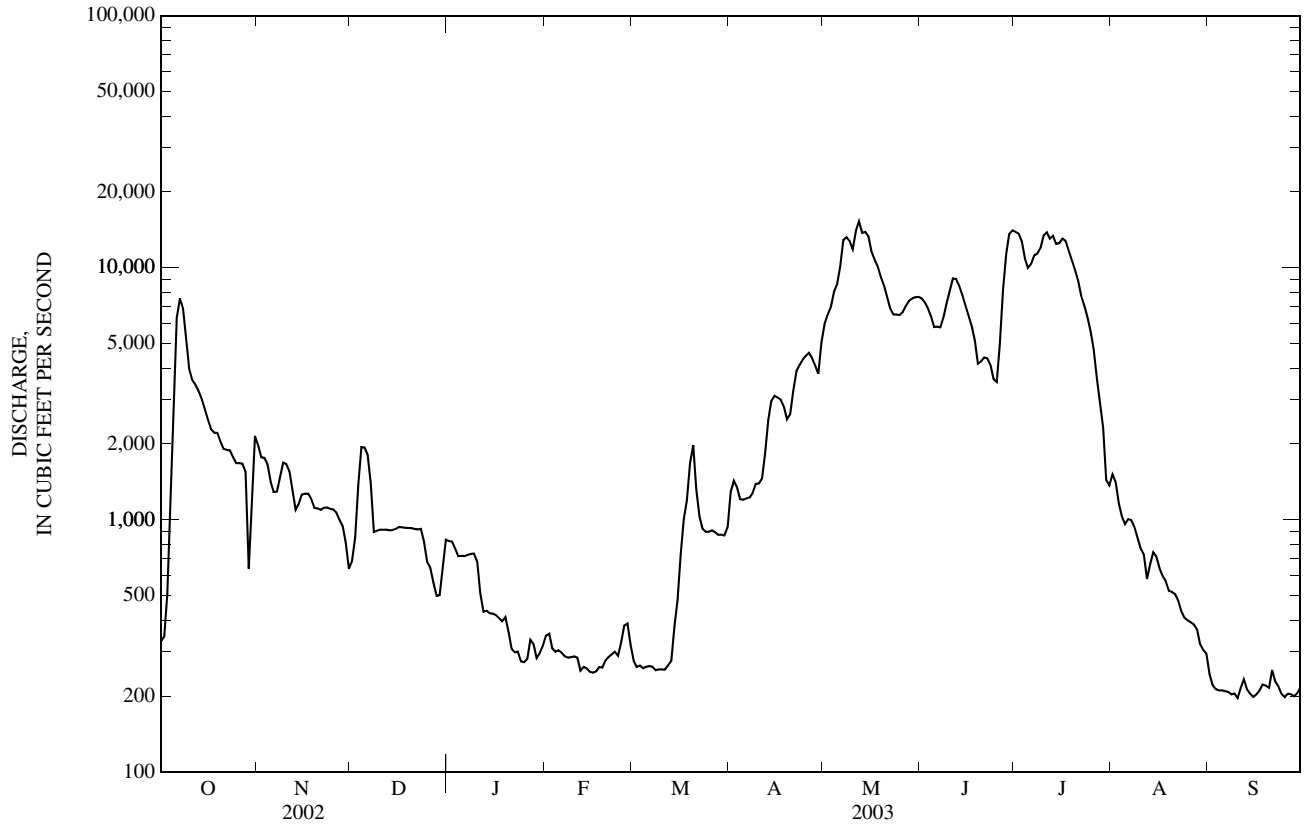
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2003, BY WATER YEAR (WY)

MEAN	771	1,196	1,191	570	1,336	3,485	7,478	8,098	7,466	6,399	2,028	439
MAX	2,613	2,871	2,696	1,231	2,775	9,385	15,940	15,050	13,760	9,524	3,549	699
(WY)	(2003)	(1997)	(1997)	(1997)	(1997)	(1997)	(2001)	(2001)	(2001)	(2003)	(2002)	(2002)
MIN	208	212	226	245	217	492	413	797	3,142	922	685	213
(WY)	(2000)	(2000)	(2000)	(2000)	(2000)	(2000)	(2000)	(2000)	(2002)	(2002)	(2003)	(2003)

05482000 DES MOINES RIVER AT SECOND AVENUE AT DES MOINES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1997 - 2003	
ANNUAL TOTAL	658,796		1,100,038			
ANNUAL MEAN	1,805		3,014		3,379	
HIGHEST ANNUAL MEAN					5,301	2001
LOWEST ANNUAL MEAN					948	2000
HIGHEST DAILY MEAN	7,820	Aug 16	15,300	May 12	18,300	Apr 16, 2001
LOWEST DAILY MEAN	210	Sep 21	196	Sep 10	160	Sep 18, 2000
ANNUAL SEVEN-DAY MINIMUM	240	Sep 21	205	Sep 24	190	Dec 17, 1999
MAXIMUM PEAK FLOW			16,000	May 12	18,500	Apr 17, 2001
MAXIMUM PEAK STAGE			19.57	May 12	20.41	Apr 17, 2001
INSTANTANEOUS LOW FLOW					160	Sep 18, 2000
ANNUAL RUNOFF (AC-FT)	1,307,000		2,182,000		2,448,000	
ANNUAL RUNOFF (CFSM)	0.29		0.48		0.54	
ANNUAL RUNOFF (INCHES)	3.92		6.55		7.35	
10 PERCENT EXCEEDS	4,030		9,450		11,800	
50 PERCENT EXCEEDS	1,170		1,110		1,200	
90 PERCENT EXCEEDS	468		255		225	

e Estimated



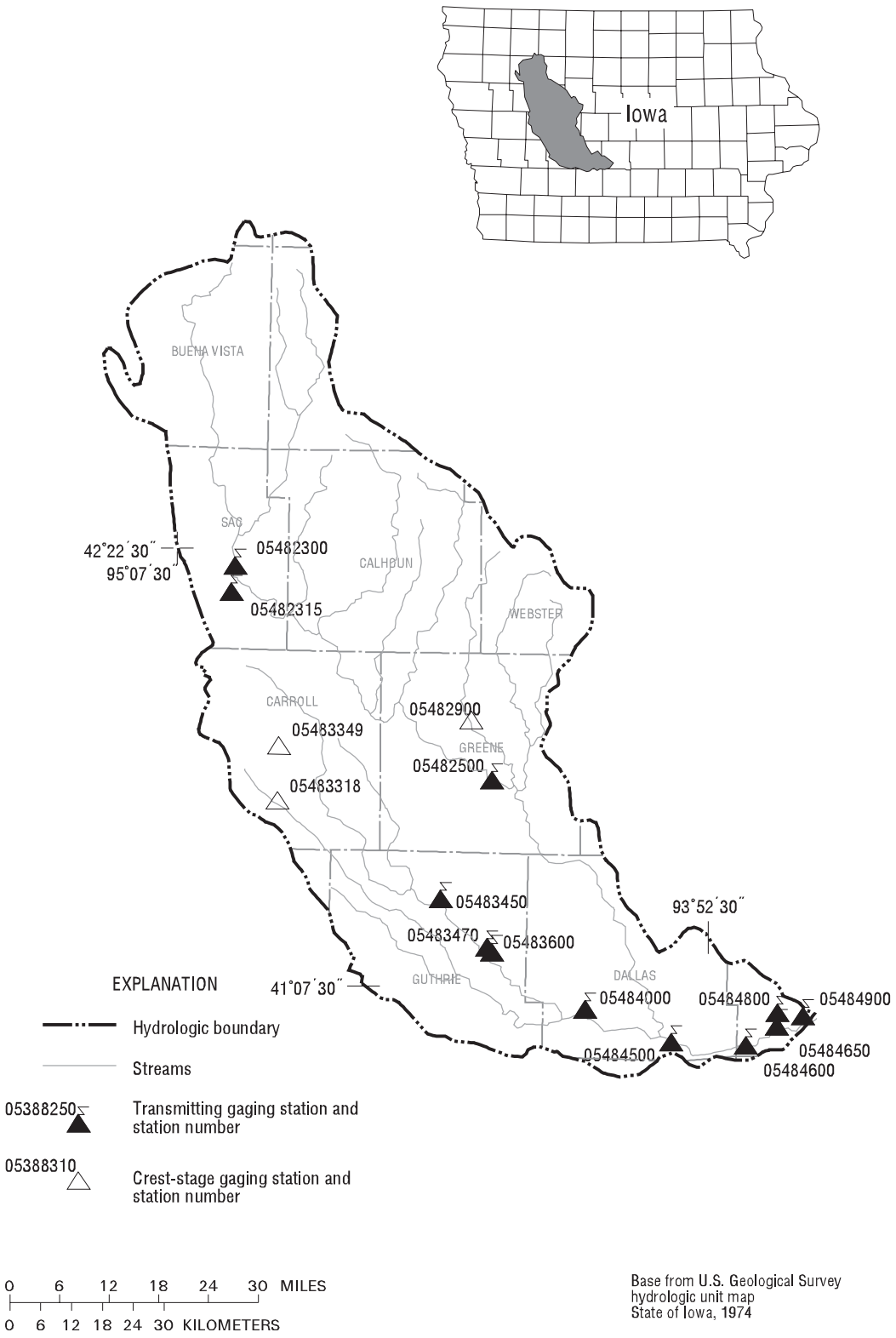


Figure 13. Locations of active continuous-record and crest-stage gaging stations in the Raccoon River drainage basins.

Gaging Stations

05482300 North Raccoon River near Sac City, IA 282
05482315 Black Hawk Lake at Lake View, IA 284
05482500 North Raccoon River near Jefferson, IA 286
05483450 Middle Raccoon River near Bayard, IA 288
05483470 Lake Panorama at Panora, IA 290
05483600 Middle Raccoon River at Panora, IA 292
05484000 South Raccoon River at Redfield, IA 294
05484500 Raccoon River at Van Meter, IA 296
05484600 Raccoon River near West Des Moines, IA 298
05484650 Raccoon River at 63rd Street, Des Moines, IA 300
05484800 Walnut Creek at Des Moines, IA 302
05484900 Raccoon River at Fleur Drive, Des Moines, IA 304

Crest Stage Gaging Stations

05482900 Hardin Creek near Farlin, IA 461
05483318 Brushy Creek near Templeton, IA 461
05483349 Middle Raccoon River Tributary at Carroll, IA 461

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA

LOCATION.--Lat 42°21'16", long 94°59'26", in NW¼ NW¼ sec.13, T.87 N., R.36 W., Sac County, Hydrologic Unit 07100006, on right bank 5 ft downstream from bridge on county highway, 2.1 mi upstream from Indian Creek, 0.3 mi upstream from Drainage Ditch 73, 4.6 mi south of Sac City, 167.1 miles upstream of mouth of Raccoon River, and at mile 367.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--700 mi^2.

PERIOD OF RECORD.--June 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,146.03 ft above NGVD of 1929. Prior to Oct. 1, 1987 at site 1.7 miles downstream at datum 1.43 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1954, reached a stage of 15.61 ft, from floodmark, discharge, 7,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	215	e64	e92	e71	e76	160	944	405	2,400	194	33
2	62	210	e89	e86	e73	e61	161	897	405	1,920	174	32
3	66	210	e89	e81	e69	e65	162	758	403	1,470	157	31
4	179	201	e108	e96	e59	e38	173	870	385	1,200	143	30
5	833	196	e97	e88	e60	e31	172	2,690	372	2,780	135	31
6	850	193	e100	e82	e56	e41	172	2,740	398	3,800	129	29
7	536	182	e113	e86	e49	e47	172	2,000	580	4,060	122	27
8	399	187	e95	e95	e58	e38	178	1,590	749	3,380	e110	27
9	345	187	e83	e79	e53	e25	186	1,540	1,140	4,970	e100	27
10	304	180	e97	e70	e55	e37	203	1,550	1,080	6,550	e99	27
11	282	167	e90	e70	e61	e48	461	1,520	1,100	5,180	e85	35
12	266	154	e89	e75	e62	e45	680	1,640	984	3,750	e76	61
13	240	153	e81	e83	e65	e63	578	1,460	850	2,670	e74	52
14	226	159	e92	e90	e77	e82	504	1,460	723	2,060	e71	40
15	228	155	e115	e83	e63	e122	436	1,410	626	1,710	68	33
16	212	149	e103	e77	e54	e196	386	1,250	542	1,460	65	30
17	208	148	114	e70	e59	211	345	1,110	486	1,270	61	29
18	202	151	115	e76	e74	164	313	996	458	1,110	58	27
19	191	147	125	e84	e72	134	312	922	471	905	55	29
20	177	143	114	e76	e82	112	316	867	470	768	54	27
21	175	141	e90	e68	e123	95	322	859	395	959	51	30
22	168	137	e90	e55	e119	90	317	828	353	858	48	30
23	160	137	e82	e45	e94	85	308	768	326	690	44	28
24	161	138	e80	e46	e77	82	308	718	509	576	41	26
25	166	116	e99	e53	e62	81	318	673	2,420	455	43	24
26	168	e97	e97	e45	e67	81	335	615	4,410	366	40	22
27	161	e69	e103	e51	e68	83	331	568	4,020	310	41	23
28	167	e100	e104	e58	e74	113	312	532	3,680	281	37	22
29	191	e107	e101	e59	---	192	290	504	3,360	258	37	22
30	221	e69	e96	e61	---	178	455	481	2,870	236	34	21
31	220	---	e87	e64	---	161	---	458	---	214	34	---
TOTAL	7,824	4,598	3,002	2,244	1,956	2,877	9,366	35,218	34,970	58,616	2,480	905
MEAN	252	153	96.8	72.4	69.9	92.8	312	1,136	1,166	1,891	80.0	30.2
MAX	850	215	125	96	123	211	680	2,740	4,410	6,550	194	61
MIN	60	69	64	45	49	25	160	458	326	214	34	21
AC-FT	15,520	9,120	5,950	4,450	3,880	5,710	18,580	69,850	69,360	116,300	4,920	1,800
CFSM	0.36	0.22	0.14	0.10	0.10	0.13	0.45	1.62	1.67	2.70	0.11	0.04
IN.	0.42	0.24	0.16	0.12	0.10	0.15	0.50	1.87	1.86	3.12	0.13	0.05

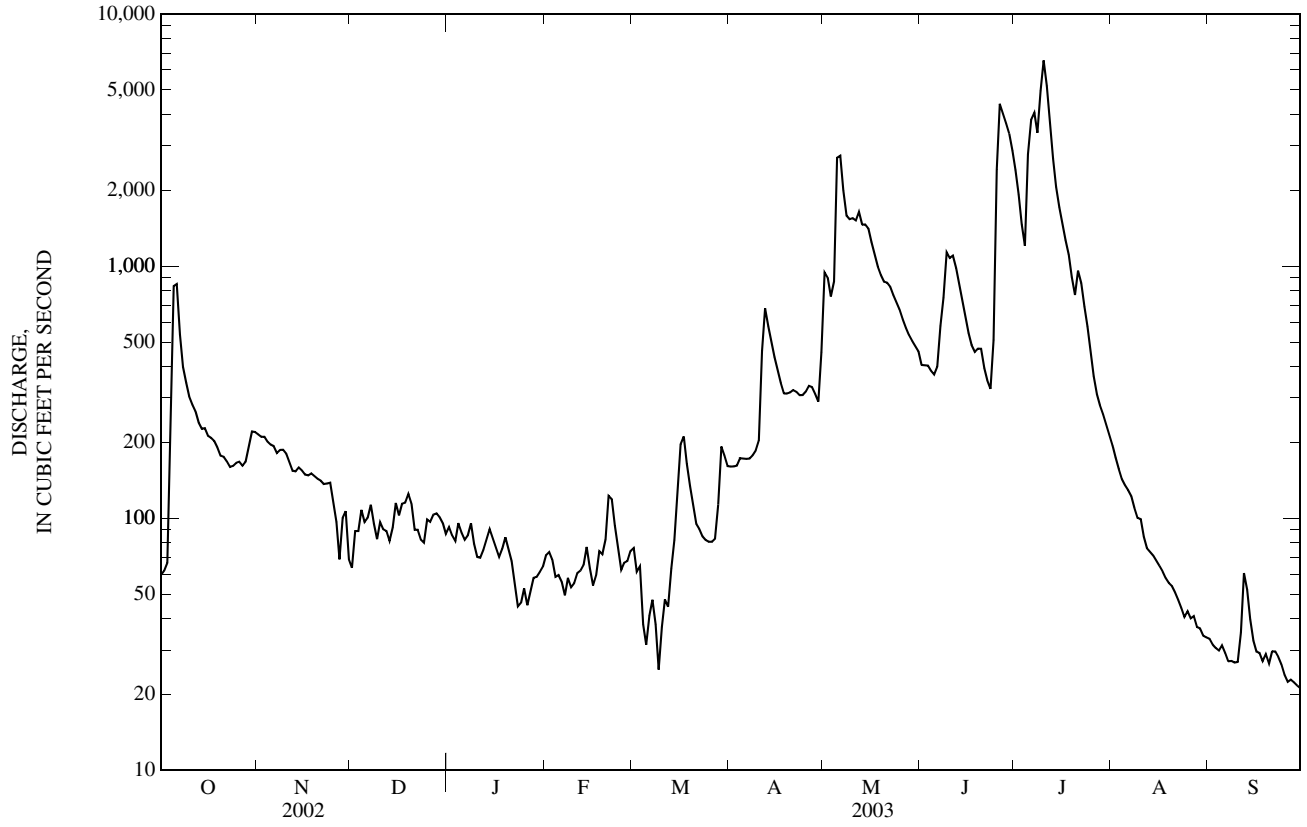
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	234	210	135	91.7	174	622	777	669	841	509	240	218
MAX	1,782	1,005	641	498	1,038	2,723	2,726	2,077	3,344	3,096	1,188	1,966
(WY)	(1983)	(1984)	(1983)	(1983)	(1984)	(1983)	(1983)	(1991)	(1984)	(1993)	(1993)	(1962)
MIN	6.39	9.44	4.39	0.87	1.16	27.2	22.7	28.2	24.7	23.0	9.29	7.80
(WY)	(1959)	(1959)	(1959)	(1977)	(1959)	(1968)	(2000)	(2000)	(1977)	(1977)	(1976)	(1976)

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003	
ANNUAL TOTAL	99,072		164,056			
ANNUAL MEAN	271		449		394	
HIGHEST ANNUAL MEAN					1,331	1983
LOWEST ANNUAL MEAN					25.3	1977
HIGHEST DAILY MEAN	2,710	May 12	6,550	Jul 10	12,400	Mar 23, 1979
LOWEST DAILY MEAN	28	Aug 3	21	Sep 30	0.00	Jan 30, 1977a
ANNUAL SEVEN-DAY MINIMUM	33	Jul 28	23	Sep 24	0.01	Jan 29, 1977
MAXIMUM PEAK FLOW			7,230	Jul 10	13,100	Mar 23, 1979
MAXIMUM PEAK STAGE			18.38	Jul 10	20.14	Jun 17, 1990
INSTANTANEOUS LOW FLOW			20	Sep 30		
ANNUAL RUNOFF (AC-FT)	196,500		325,400		285,300	
ANNUAL RUNOFF (CFSM)	0.39		0.64		0.56	
ANNUAL RUNOFF (INCHES)	5.26		8.72		7.64	
10 PERCENT EXCEEDS	624		1,120		1,010	
50 PERCENT EXCEEDS	143		137		133	
90 PERCENT EXCEEDS	67		39		17	

a Also Jan. 31 to Feb. 4, 1977.
e Estimated.



05482315 BLACK HAWK LAKE AT LAKE VIEW, IA

LOCATION.--Lat 42°18'15", long 95°02'30", in NW¼ SE¼ sec.33, T.87 N., R.36 W., Sac County, Hydrologic Unit 07100006, on south shore across from swimming beach at Lake View and 2 mi. upstream from lake outlet.

DRAINAGE AREA.--23.3 mi^2.

PERIOD OF RECORD.--April 1970 to September 1975; April 1978 to September 1992, October 1994 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,213.50 ft above NGVD of 1929 and 7.00 ft below crest of spillway of dam at outlet. Prior to June 25, 1970, nonrecording gage at lake outlet. Prior to Jan. 22, 2001, at datum 5.0 ft higher.

REMARKS.--Gage height was considered reliable for the year. Lake is formed by concrete dam with ungated overflow spillway at elevation 1,220.50 ft. above sea level. Lake is used for conservation and recreation. Area of lake is approximately 957 acres. U.S. Geological Survey satellite data collection platform at station.

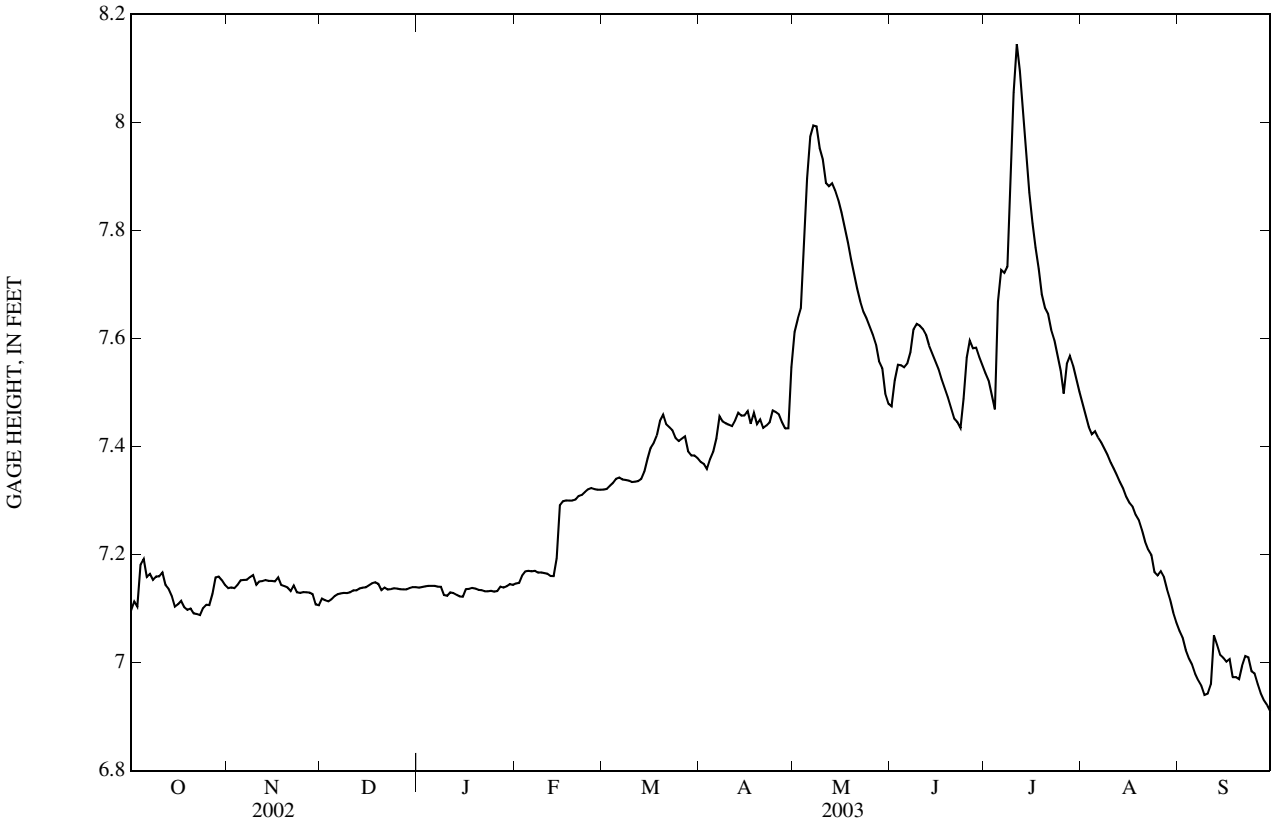
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 4.34 ft June 22, 1996, datum then in use; minimum, 4.91 ft Jan. 25, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 8.16 ft July 11; minimum, 6.87 ft Sept. 30.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.10	7.14	7.12	7.14	7.15	7.32	7.37	7.61	7.47	7.54	7.48	7.06
2	7.11	7.14	7.12	7.14	7.15	7.32	7.37	7.64	7.52	7.52	7.46	7.05
3	7.10	7.14	7.11	7.14	7.16	7.33	7.36	7.66	7.55	7.50	7.44	7.02
4	7.18	7.14	7.12	7.14	7.17	7.33	7.38	7.76	7.55	7.47	7.42	7.01
5	7.19	7.15	7.12	7.14	7.17	7.34	7.39	7.90	7.55	7.67	7.43	7.00
6	7.16	7.15	7.13	7.14	7.17	7.34	7.41	7.97	7.55	7.73	7.42	6.98
7	7.16	7.15	7.13	7.14	7.17	7.34	7.46	7.99	7.57	7.72	7.41	6.97
8	7.15	7.16	7.13	7.14	7.17	7.34	7.45	7.99	7.62	7.73	7.40	6.96
9	7.16	7.16	7.13	7.13	7.17	7.34	7.44	7.95	7.63	7.91	7.38	6.94
10	7.16	7.14	7.13	7.12	7.17	7.33	7.44	7.93	7.62	8.06	7.37	6.94
11	7.17	7.15	7.13	7.13	7.16	7.33	7.44	7.89	7.62	8.14	7.36	6.96
12	7.14	7.15	7.13	7.13	7.16	7.34	7.45	7.88	7.61	8.10	7.35	7.05
13	7.14	7.15	7.14	7.13	7.16	7.34	7.46	7.89	7.59	8.02	7.33	7.03
14	7.12	7.15	7.14	7.12	7.19	7.35	7.46	7.87	7.57	7.95	7.32	7.01
15	7.10	7.15	7.14	7.12	7.29	7.38	7.46	7.86	7.56	7.87	7.31	7.01
16	7.11	7.15	7.14	7.14	7.30	7.40	7.47	7.83	7.54	7.81	7.30	7.00
17	7.11	7.16	7.15	7.14	7.30	7.41	7.44	7.81	7.52	7.77	7.29	7.01
18	7.10	7.14	7.15	7.14	7.30	7.42	7.46	7.78	7.51	7.73	7.27	6.97
19	7.10	7.14	7.15	7.14	7.30	7.45	7.44	7.75	7.49	7.68	7.26	6.97
20	7.10	7.14	7.13	7.13	7.30	7.46	7.45	7.72	7.47	7.66	7.25	6.97
21	7.09	7.13	7.14	7.13	7.31	7.44	7.43	7.69	7.45	7.65	7.22	6.99
22	7.09	7.14	7.14	7.13	7.31	7.44	7.44	7.67	7.45	7.62	7.21	7.01
23	7.09	7.13	7.14	7.13	7.32	7.43	7.44	7.65	7.43	7.60	7.20	7.01
24	7.10	7.13	7.14	7.13	7.32	7.42	7.47	7.64	7.49	7.57	7.17	6.98
25	7.11	7.13	7.14	7.13	7.32	7.41	7.46	7.62	7.56	7.54	7.16	6.98
26	7.11	7.13	7.14	7.13	7.32	7.41	7.46	7.61	7.60	7.50	7.17	6.96
27	7.13	7.13	7.14	7.14	7.32	7.42	7.44	7.59	7.58	7.55	7.16	6.94
28	7.16	7.13	7.14	7.14	7.32	7.39	7.43	7.56	7.58	7.57	7.14	6.93
29	7.16	7.11	7.14	7.14	---	7.38	7.43	7.55	7.57	7.55	7.12	6.92
30	7.15	7.11	7.14	7.15	---	7.38	7.55	7.50	7.55	7.53	7.09	6.91
31	7.14	---	7.14	7.14	---	7.38	---	7.48	---	7.50	7.07	---
MEAN	7.13	7.14	7.13	7.13	7.24	7.38	7.44	7.75	7.55	7.70	7.29	6.98
MAX	7.19	7.16	7.15	7.15	7.32	7.46	7.55	7.99	7.63	8.14	7.48	7.06
MIN	7.09	7.11	7.11	7.12	7.15	7.32	7.36	7.48	7.43	7.47	7.07	6.91

05482315 BLACK HAWK LAKE AT LAKE VIEW, IA—Continued



05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IA

LOCATION.--Lat 41°59'17", long 94°22'36", in SW¼ NW¼ sec.20, T.83 N., R.30 W., Greene County, Hydrologic Unit 07100006, on right bank 20 ft downstream from bridge on State Highway 4, 0.1 mi downstream from Drainage Ditch 33 and 40, 1.9 mi south of Jefferson, 4.7 mi upstream from Hardin Creek, 92.0 miles upstream of mouth of Raccoon River, and at mile 292.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,619 mi^2.

PERIOD OF RECORD.--March 1940 to current year. Prior to April 1940, monthly discharge only, published in WSP 1308. Prior to October 1955, published as "Raccoon River near Jefferson".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1950-51.

GAGE.--Water-stage recorder. Datum of gage is 967.09 ft above NGVD of 1929. Prior to Apr. 22, 1946, nonrecording gage at site 4 mi upstream at different datum. Apr. 22 to June 25, 1946, nonrecording gage, June 26, 1946 to Sept. 30, 1955, water-stage recorder, Oct. 1, 1955 to Apr. 30, 1958, nonrecording gage, at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	143	607	288	e272	e140	e192	398	1,440	1,250	3,450	644	110
2	193	598	e308	e263	e143	e180	385	2,780	1,200	2,900	592	107
3	312	591	e308	e253	e138	e186	374	2,590	1,210	2,420	539	105
4	542	574	e319	e270	e128	e156	355	3,380	1,220	1,950	494	105
5	1,070	561	e306	e254	e129	e150	359	5,710	1,200	2,080	456	101
6	1,350	549	e312	e236	e125	e161	364	7,170	1,180	4,350	430	103
7	1,470	534	e323	e226	e118	e166	379	7,680	1,220	5,830	407	85
8	1,210	523	e305	e243	e128	e154	375	6,120	1,470	6,010	382	88
9	1,010	519	e292	e224	e122	e144	397	5,130	1,890	8,270	353	80
10	898	515	e309	e203	e120	e150	441	4,860	2,290	10,400	342	73
11	812	488	e301	e189	e125	e159	543	4,600	2,200	12,000	344	84
12	737	462	e297	e187	e126	e198	836	4,370	2,030	12,200	310	110
13	679	441	e291	e191	e126	e292	1,170	4,090	1,940	10,900	283	130
14	635	431	e298	e198	e145	e400	1,120	4,750	1,750	7,130	265	147
15	595	424	e326	e183	e138	e646	1,000	4,220	1,590	4,380	249	147
16	577	419	e314	e166	e134	e871	918	3,680	1,460	3,390	234	134
17	564	408	321	e155	e145	709	815	3,160	1,390	2,770	221	115
18	549	407	338	e161	e159	649	745	2,790	1,410	2,310	206	e106
19	525	407	361	e168	e157	561	710	2,520	1,310	1,990	189	e105
20	499	407	e345	e155	e190	460	724	2,300	1,190	1,750	180	e99
21	478	399	e324	e142	e261	396	791	2,130	1,180	1,570	166	e101
22	460	383	291	e123	e296	347	912	2,030	1,110	1,500	152	e96
23	445	383	183	e115	e290	313	903	1,940	1,080	1,490	145	e93
24	439	371	153	e115	e251	285	852	1,830	1,040	1,320	123	e92
25	438	348	e191	e123	e215	254	856	1,750	1,090	1,220	115	90
26	443	e330	e230	e115	e188	237	864	1,660	2,350	1,100	122	e86
27	440	e310	e255	e120	e188	232	896	1,570	4,370	1,030	120	e78
28	452	348	e270	e125	e191	237	898	1,480	5,530	974	115	e70
29	469	375	e275	e129	---	244	832	1,430	4,840	846	142	66
30	519	e314	e274	e129	---	288	855	1,380	4,090	771	121	61
31	585	---	e265	e134	---	388	---	1,310	---	708	113	---
TOTAL	19,538	13,426	8,973	5,567	4,616	9,805	21,067	101,850	57,080	119,009	8,554	2,967
MEAN	630	448	289	180	165	316	702	3,285	1,903	3,839	276	98.9
MAX	1,470	607	361	272	296	871	1,170	7,680	5,530	12,200	644	147
MIN	143	310	153	115	118	144	355	1,310	1,040	708	113	61
AC-FT	38,750	26,630	17,800	11,040	9,160	19,450	41,790	202,000	113,200	236,100	16,970	5,890
CFSM	0.39	0.28	0.18	0.11	0.10	0.20	0.43	2.03	1.18	2.37	0.17	0.06
IN.	0.45	0.31	0.21	0.13	0.11	0.23	0.48	2.34	1.31	2.73	0.20	0.07

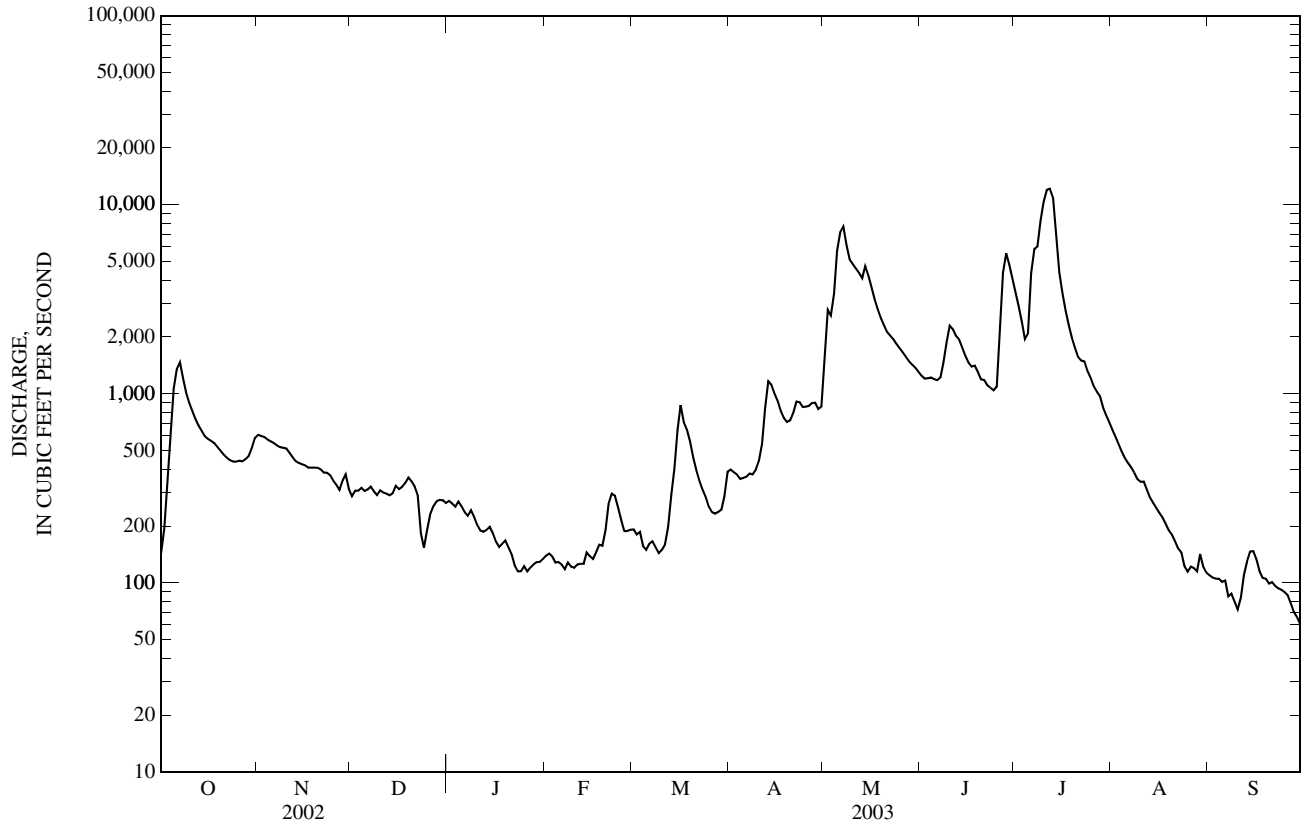
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	424	381	270	199	402	1,256	1,505	1,471	1,851	1,066	506	382
MAX	3,654	2,011	1,228	1,045	2,407	4,990	5,650	4,702	6,831	7,584	3,007	2,823
(WY)	(1974)	(1974)	(1974)	(1973)	(1984)	(1983)	(1983)	(1984)	(1984)	(1993)	(1993)	(1962)
MIN	5.04	19.8	13.4	3.58	6.89	68.5	46.3	48.4	61.9	18.1	12.1	16.6
(WY)	(1957)	(1956)	(1977)	(1977)	(1977)	(1956)	(1956)	(2000)	(1977)	(1956)	(1956)	(1955)

05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	226,460		372,452			
ANNUAL MEAN	620		1,020		810	
HIGHEST ANNUAL MEAN					2,615	1993
LOWEST ANNUAL MEAN					32.8	1956
HIGHEST DAILY MEAN	4,810	May 13	12,200	Jul 12	23,200	Jun 24, 1947
LOWEST DAILY MEAN	83	Aug 3	61	Sep 30	0.60	Oct 5, 1956
ANNUAL SEVEN-DAY MINIMUM	98	Jul 28	78	Sep 24	0.91	Oct 4, 1956
MAXIMUM PEAK FLOW			12,400	Jul 11	29,100	Jun 23, 1947
MAXIMUM PEAK STAGE			16.24	Jul 11	22.30	Jun 23, 1947
INSTANTANEOUS LOW FLOW			55	Sep 30		
ANNUAL RUNOFF (AC-FT)	449,200		738,800		586,800	
ANNUAL RUNOFF (CFSM)	0.38		0.63		0.50	
ANNUAL RUNOFF (INCHES)	5.20		8.56		6.80	
10 PERCENT EXCEEDS	1,470		2,460		2,040	
50 PERCENT EXCEEDS	365		383		290	
90 PERCENT EXCEEDS	181		121		43	

e Estimated



05483450 MIDDLE RACCOON RIVER NEAR BAYARD, IA

LOCATION.--Lat 41°46'43", long 94°29'33", in SW¼ SW¼ sec.32, T.81 N., R.31 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft downstream from bridge on State Highway 25, 0.2 mi downstream from Battle Run Creek, 1.8 mi upstream from Springbrook Creek, 5.8 mi southeast of Bayard, 10.3 mi upstream from dam at Lake Panorama, at mile 78.0 mi. upstream from mouth of Raccoon River, and at mile 279.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--375 mi^2.

PERIOD OF RECORD.--March 1979 to current year. Occasional low-flow measurements, water years 1976, 1977.

GAGE.--Water-stage recorder. Datum of gage is 1,040.00 ft above NGVD of 1929. Prior to June 23, 1979, nonrecording gage at present site and datum.

REMARKS.--Records are good, except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with telephone modem and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 3, 1973 reached a stage of 21.63 ft, from contracted-opening measurement, discharge, 14,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	117	e76	e63	e65	e102	96	798	241	213	162	36
2	280	115	e70	e55	e67	e82	84	610	248	191	152	35
3	329	115	e69	e47	e61	e89	78	486	269	169	140	34
4	799	110	e78	e58	e52	e53	77	1,250	260	151	131	33
5	801	109	e63	e55	e47	e49	79	2,880	271	167	127	32
6	464	110	e68	e46	e39	e61	76	2,050	299	374	122	32
7	342	101	e75	e39	e32	e71	78	1,420	286	740	114	31
8	280	100	e72	e58	e40	e66	96	1,030	307	406	e102	30
9	241	100	e60	e32	e38	e53	92	1,310	359	1,810	e99	30
10	209	98	e54	e18	e38	e67	120	1,080	363	3,130	e85	29
11	185	90	e62	e18	e43	e92	221	966	355	1,580	e89	33
12	166	85	e56	e25	e45	e173	234	834	314	1,010	e96	46
13	143	85	e54	e35	e48	e217	193	720	293	743	e92	58
14	134	86	e59	e49	e80	e365	163	1,050	267	605	e81	38
15	134	84	e68	e47	e109	e901	143	959	250	507	e70	33
16	125	81	e75	e42	e137	427	137	741	236	423	66	31
17	124	80	79	e38	e145	234	125	630	233	369	64	29
18	121	82	74	e51	e155	159	112	556	272	327	62	29
19	113	81	71	e62	e152	131	123	509	229	296	58	32
20	102	78	64	e56	e152	135	168	467	202	275	55	34
21	102	77	e54	e51	e214	131	180	426	187	261	56	33
22	99	75	e54	e47	e340	112	163	403	180	243	51	37
23	95	75	e45	e34	e151	101	151	384	170	237	47	40
24	100	75	e49	e45	e106	95	160	370	155	216	46	33
25	105	e69	e52	e49	e84	91	201	346	185	200	43	31
26	104	e68	e57	e32	e84	88	206	323	255	186	41	30
27	97	e63	e65	e42	e85	93	192	304	221	178	40	30
28	103	e76	e67	e50	e97	104	188	291	259	256	40	30
29	116	e86	e68	e49	---	111	166	279	307	218	38	30
30	130	e68	e65	e53	---	103	722	272	248	196	37	30
31	123	---	e58	e56	---	93	---	257	---	174	36	---
TOTAL	6,305	2,639	1,981	1,402	2,706	4,649	4,824	24,001	7,721	15,851	2,442	1,009
MEAN	203	88.0	63.9	45.2	96.6	150	161	774	257	511	78.8	33.6
MAX	801	117	79	63	340	901	722	2,880	363	3,130	162	58
MIN	39	63	45	18	32	49	76	257	155	151	36	29
AC-FT	12,510	5,230	3,930	2,780	5,370	9,220	9,570	47,610	15,310	31,440	4,840	2,000
CFSM	0.54	0.23	0.17	0.12	0.26	0.40	0.43	2.06	0.69	1.36	0.21	0.09
IN.	0.63	0.26	0.20	0.14	0.27	0.46	0.48	2.38	0.77	1.57	0.24	0.10

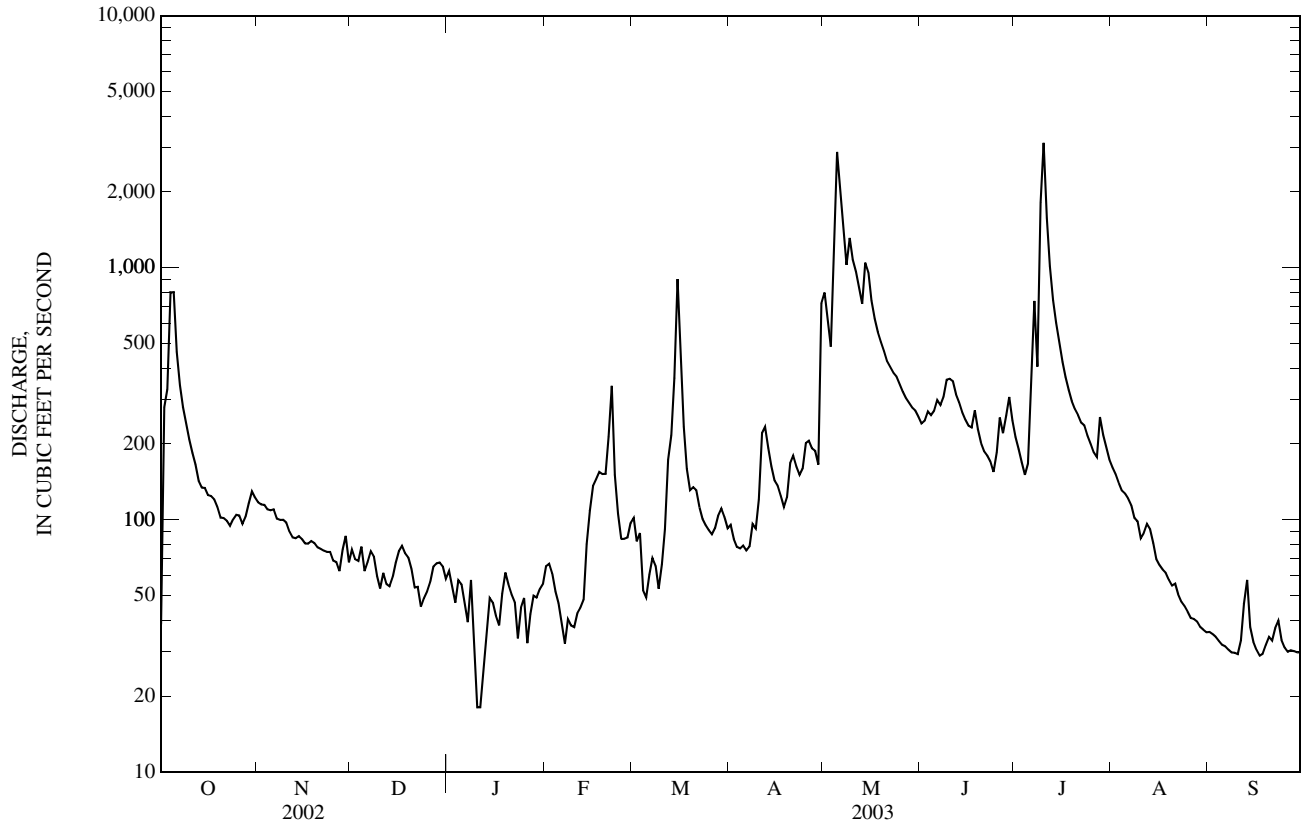
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 2003, BY WATER YEAR (WY)

MEAN	113	114	112	84.6	179	280	373	468	523	408	179	103
MAX	587	376	347	175	645	907	1,035	993	1,667	2,653	673	466
(WY)	(1987)	(1993)	(1993)	(1993)	(1983)	(1993)	(1991)	(1984)	(1990)	(1993)	(1993)	(1993)
MIN	20.1	18.3	12.5	13.8	27.4	23.3	22.9	51.6	77.0	40.2	32.1	18.8
(WY)	(1981)	(1981)	(1981)	(1981)	(1990)	(1981)	(1981)	(1981)	(2000)	(1980)	(2000)	(1980)

05483450 MIDDLE RACCOON RIVER NEAR BAYARD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1980 - 2003	
ANNUAL TOTAL	56,964		75,530			
ANNUAL MEAN	156		207		245	
HIGHEST ANNUAL MEAN					677	1993
LOWEST ANNUAL MEAN					54.1	1981
HIGHEST DAILY MEAN	1,710	May 12	3,130	Jul 10	18,100	Jul 9, 1993
LOWEST DAILY MEAN	20	Jan 24	18	Jan 10a	5.5	Jun 13, 1981
ANNUAL SEVEN-DAY MINIMUM	29	Jan 30	31	Sep 24	7.3	Jun 8, 1981
MAXIMUM PEAK FLOW			3,640	Jul 10	27,500	Jul 9, 1993
MAXIMUM PEAK STAGE			19.49	Jul 10	29.02	Jul 9, 1993
ANNUAL RUNOFF (AC-FT)	113,000		149,800		177,400	
ANNUAL RUNOFF (CFSM)	0.42		0.55		0.65	
ANNUAL RUNOFF (INCHES)	5.65		7.49		8.87	
10 PERCENT EXCEEDS	344		413		555	
50 PERCENT EXCEEDS	82		100		108	
90 PERCENT EXCEEDS	42		38		32	

a Also Jan. 11; ice affected.
e Estimated.



05483470 LAKE PANORAMA AT PANORA, IOWA

LOCATION.--Lat 41°41'44", long 94°22'53", in SW¼ NE¼ sec.31, T.80 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, in gate control building of dam on Middle Raccoon River, 0.5 mi upstream from State Highway 44, 1.0 mi west of Panora, 4.4 mi upstream from Bay Branch, 67.7 mi. upstream from mouth of Raccoon River, and at mile 268.8 upstream from mouth of Des Moines River.

DRAINAGE AREA.--433 mi^2.

PERIOD OF RECORD.--May 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above NGVD of 1929.

REMARKS.--Lake is formed by earthfill dam with 100 ft bascule gate and concrete chute spillway, and 300 ft earthen emergency spillway. Low-flow outlet is 30-inch conduit and gate valve through dam. Dam was completed in August, 1970 and began filling April 27, 1971. Total storage, 60,000 acre-ft, surface area, 2,900 acres, at top of dam, elevation 1,068 ft. Storage unknown at top of spillway, elevation 1,048 ft. Normal storage, 19,700 acre-ft, surface area, 1,270 acres with bascule gate closed, elevation 1,045 ft. Dead storage unknown with bascule gate open, elevation 1,036 ft. Present lake classification is utility (industrial) but is also used for recreation. U.S. Geological Survey data collection platform with telephone modem at station.

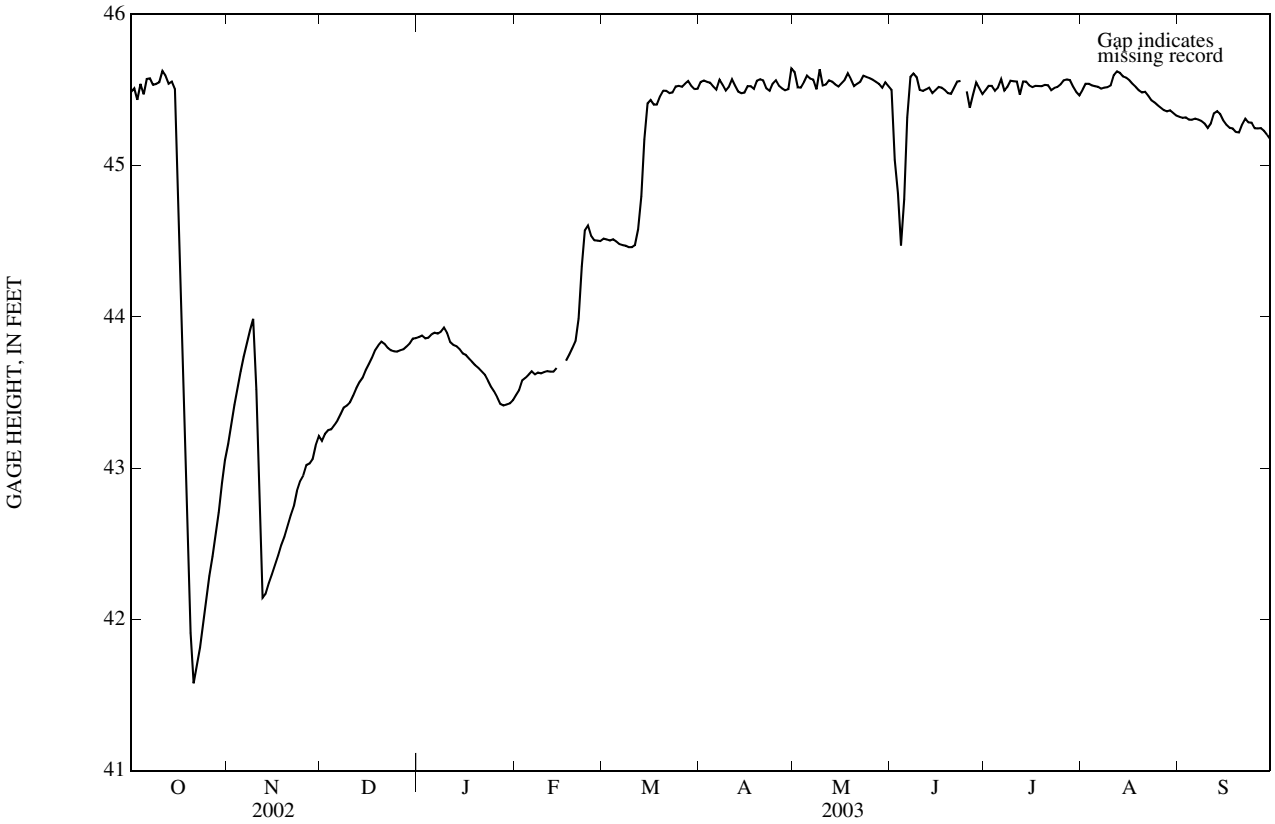
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height,50.68 ft July 9, 1993; minimum, 41.53 ft Oct. 20-21, 2002.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 45.91 ft Apr. 30; minimum recorded, 41.53 ft Oct. 20-21.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45.49	43.16	43.18	43.87	43.48	44.52	45.55	45.62	45.50	45.50	45.50	45.32
2	45.51	43.28	43.23	43.88	43.52	44.51	45.56	45.52	45.04	45.53	45.54	45.32
3	45.44	43.42	43.25	43.86	43.58	44.50	45.55	45.52	44.82	45.53	45.54	45.32
4	45.54	43.53	43.26	43.86	43.60	44.51	45.55	45.55	44.47	45.50	45.53	45.30
5	45.47	43.64	43.29	43.88	43.62	44.50	45.52	45.60	44.78	45.52	45.52	45.30
6	45.57	43.74	43.32	43.90	43.64	44.48	45.50	45.58	45.32	45.57	45.52	45.31
7	45.58	43.82	43.36	43.89	43.62	44.47	45.57	45.57	45.59	45.50	45.51	45.30
8	45.54	43.91	43.40	43.90	43.63	44.47	45.53	45.50	45.61	45.52	45.52	45.29
9	45.54	43.99	43.41	43.93	43.63	44.46	45.50	45.64	45.59	45.56	45.52	45.28
10	45.55	43.52	43.44	43.89	43.63	44.46	45.52	45.53	45.50	45.56	45.53	45.25
11	45.63	42.68	43.48	43.83	43.64	44.47	45.57	45.54	45.49	45.56	45.60	45.28
12	45.60	42.14	43.53	43.81	43.64	44.58	45.53	45.56	45.50	45.47	45.62	45.34
13	45.54	42.17	43.57	43.80	43.64	44.80	45.49	45.55	45.52	45.56	45.61	45.36
14	45.56	42.24	43.60	43.79	43.66	45.17	45.48	45.54	45.48	45.56	45.59	45.34
15	45.51	42.30	43.65	43.76	---	45.41	45.48	45.52	45.50	45.53	45.58	45.30
16	45.08	42.36	43.69	43.75	---	45.43	45.53	45.54	45.52	45.52	45.56	45.27
17	44.47	42.42	43.73	43.72	43.71	45.40	45.53	45.57	45.52	45.53	45.54	45.25
18	43.67	42.49	43.78	43.70	43.75	45.40	45.51	45.61	45.50	45.53	45.52	45.25
19	42.82	42.55	43.81	43.68	43.79	45.46	45.56	45.57	45.48	45.53	45.50	45.22
20	41.91	42.62	43.84	43.66	43.84	45.50	45.57	45.53	45.47	45.53	45.48	45.22
21	41.58	42.69	43.82	43.64	43.99	45.49	45.56	45.54	45.52	45.53	45.49	45.27
22	41.70	42.75	43.80	43.62	44.33	45.48	45.51	45.56	45.56	45.50	45.46	45.31
23	41.81	42.85	43.78	43.58	44.57	45.48	45.49	45.59	45.56	45.51	45.43	45.29
24	41.97	42.91	43.77	43.54	44.60	45.52	45.54	45.59	---	45.52	45.42	45.28
25	42.14	42.95	43.77	43.51	44.53	45.53	45.56	45.58	45.49	45.54	45.40	45.25
26	42.29	43.02	43.78	43.47	44.51	45.52	45.53	45.57	45.38	45.56	45.38	45.25
27	42.42	43.03	43.79	43.42	44.50	45.54	45.51	45.55	45.47	45.57	45.37	45.25
28	42.56	43.06	43.80	43.41	44.50	45.56	45.50	45.54	45.55	45.57	45.36	45.23
29	42.71	43.15	43.82	43.42	---	45.53	45.51	45.51	45.51	45.52	45.37	45.20
30	42.90	43.21	43.86	43.43	---	45.51	45.64	45.55	45.47	45.49	45.35	45.17
31	43.05	---	43.86	43.45	---	45.51	---	45.52	---	45.46	45.33	---
MEAN	44.07	42.99	43.60	43.70	---	45.07	45.53	45.56	---	45.53	45.49	45.28
MAX	45.63	43.99	43.86	43.93	---	45.56	45.64	45.64	---	45.57	45.62	45.36
MIN	41.58	42.14	43.18	43.41	---	44.46	45.48	45.50	---	45.46	45.33	45.17

05483470 LAKE PANORAMA AT PANORA, IOWA—Continued



05483600 MIDDLE RACCOON RIVER AT PANORA, IA

LOCATION.--Lat 41°41'14", long 94°22'15", in NE¼ NW¼ sec.5, T.79 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft downstream from bridge on Soldier Trail, 0.2 mi southwest of Panora, 1.5 mi upstream from Andy's Branch, 1.6 mi downstream from Lake Panorama, 18.1 mi upstream from mouth, 66.1 mi. upstream from mouth of Raccoon River, and at mile 267.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--440 mi^2.

PERIOD OF RECORD.--June 1958 to current year.

REVISED RECORDS.--WDR IA-74-1: 1973 (P).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 991.20 ft above NGVD of 1929.

REMARKS.--Records good. City of Panora diverts approximately 100 acre-ft/yr upstream of station. Flow regulated by dam on Lake Panorama since August 1970. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1953, reached a stage of 14.3 ft, from floodmark, discharge, about 14,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	57	58	59	41	66	100	884	294	200	92	34
2	297	57	60	59	44	71	104	642	513	198	98	24
3	306	56	60	61	45	70	105	474	452	195	101	25
4	684	57	60	62	43	68	107	1,390	294	193	94	23
5	735	57	60	62	41	66	104	3,190	61	162	96	22
6	380	58	59	62	42	66	95	2,200	80	342	94	27
7	307	59	59	62	43	64	119	1,460	283	820	83	30
8	244	59	59	62	44	62	136	1,070	335	476	79	18
9	208	122	59	61	45	56	132	1,360	382	1,700	79	25
10	135	417	59	60	41	58	126	1,140	457	3,310	69	33
11	163	431	60	60	40	69	204	922	343	1,570	80	34
12	171	146	59	59	41	81	243	830	316	914	90	50
13	127	55	59	59	41	121	195	715	314	603	86	56
14	104	55	59	59	44	273	167	1,040	283	531	81	52
15	219	56	60	59	54	796	136	1,000	236	441	76	42
16	361	57	60	59	54	463	140	715	224	336	77	34
17	405	57	60	59	45	270	144	597	228	311	73	31
18	504	55	59	59	42	154	124	534	285	275	60	37
19	476	54	59	59	45	145	164	528	230	242	55	33
20	456	54	59	59	57	159	194	451	188	228	51	30
21	70	54	59	59	70	157	207	394	169	224	51	45
22	44	57	59	59	103	142	171	369	177	202	50	48
23	44	57	59	59	155	115	146	363	190	181	48	44
24	44	57	59	58	156	111	178	364	197	158	42	42
25	44	57	59	57	121	113	218	358	248	141	41	30
26	44	58	59	57	88	111	215	328	257	139	39	31
27	44	59	59	59	77	120	199	307	190	151	36	33
28	42	59	59	44	68	130	185	305	287	199	35	32
29	42	59	59	39	---	123	161	265	328	190	38	25
30	41	58	59	41	---	119	1,360	267	267	166	35	27
31	46	---	59	41	---	103	---	262	---	129	34	---
TOTAL	6,836	2,594	1,836	1,774	1,730	4,522	5,879	24,724	8,108	14,927	2,063	1,017
MEAN	221	86.5	59.2	57.2	61.8	146	196	798	270	482	66.5	33.9
MAX	735	431	60	62	156	796	1,360	3,190	513	3,310	101	56
MIN	41	54	58	39	40	56	95	262	61	129	34	18
AC-FT	13,560	5,150	3,640	3,520	3,430	8,970	11,660	49,040	16,080	29,610	4,090	2,020
CFSM	0.50	0.20	0.13	0.13	0.14	0.33	0.45	1.81	0.61	1.09	0.15	0.08
IN.	0.58	0.22	0.16	0.15	0.15	0.38	0.50	2.09	0.69	1.26	0.17	0.09

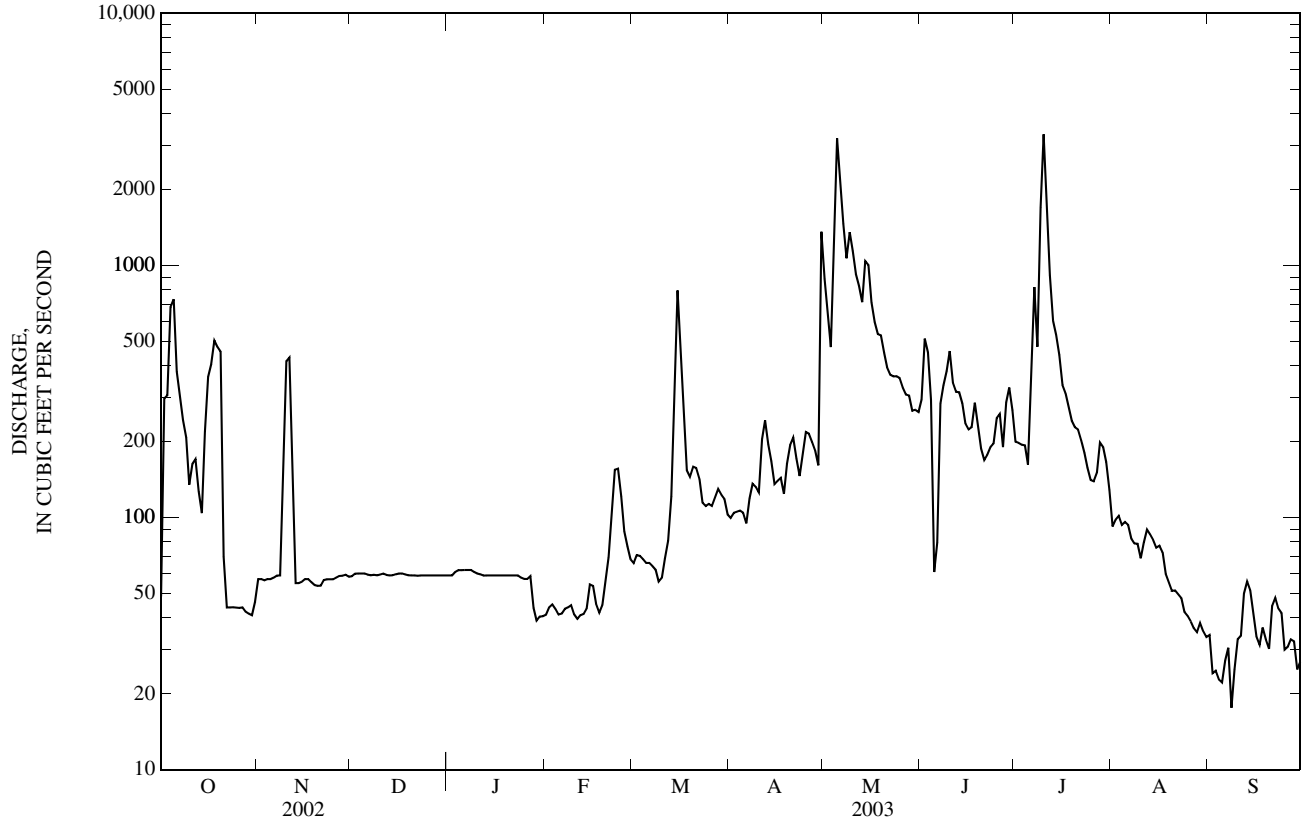
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 2003, BY WATER YEAR (WY)

MEAN	125	139	120	97.2	208	360	377	498	486	386	166	131
MAX	670	588	356	439	838	1,479	1,222	1,458	1,646	2,731	668	528
(WY)	(1987)	(1973)	(1993)	(1973)	(1971)	(1979)	(1984)	(1974)	(1990)	(1993)	(1996)	(1973)
MIN	19.5	12.8	7.60	6.95	27.8	20.2	26.4	20.0	9.40	5.56	22.2	19.3
(WY)	(1981)	(1971)	(1971)	(1971)	(1972)	(1981)	(1977)	(1977)	(1977)	(1977)	(1971)	(1980)

05483600 MIDDLE RACCOON RIVER AT PANORA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1971 - 2003a	
ANNUAL TOTAL	56,530		76,010			
ANNUAL MEAN	155		208		258	
HIGHEST ANNUAL MEAN					701	1973
LOWEST ANNUAL MEAN					38.6	1977
HIGHEST DAILY MEAN	1,850	May 12	3,310	Jul 10	17,500	Jul 10, 1993
LOWEST DAILY MEAN	32	Aug 3	18	Sep 8	0.00	Jun 9, 1977b
ANNUAL SEVEN-DAY MINIMUM	43	Sep 11	24	Sep 2	3.1	Jul 8, 1977
MAXIMUM PEAK FLOW			3,700	Jul 10	22,400	Jul 9, 1993
MAXIMUM PEAK STAGE			8.40	Jul 10	20.04	Jul 9, 1993
INSTANTANEOUS LOW FLOW			14	Sep 8c		
ANNUAL RUNOFF (AC-FT)	112,100		150,800		186,700	
ANNUAL RUNOFF (CFSM)	0.35		0.47		0.59	
ANNUAL RUNOFF (INCHES)	4.78		6.43		7.96	
10 PERCENT EXCEEDS	362		456		572	
50 PERCENT EXCEEDS	73		77		105	
90 PERCENT EXCEEDS	45		41		31	

a Post regulation.
b Also June 10, 1977, result of gate operations at Lake Panorama.
c Also Sept. 9



05484000 SOUTH RACCOON RIVER AT REDFIELD, IA

LOCATION.--Lat 41°35'22", long 94°09'04", in SW¼ NE¼ sec.2, T.78 N., R.29 W., Dallas County, Hydrologic Unit 07100007, on right bank 20 ft upstream from bridge on H Avenue, 3.4 mi. downstream from bridge on U.S. Highway 6, 3.4 mi. downstream from Middle Raccoon River, 14.3 mi. upstream from mouth, 44.6 miles upstream of mouth of Raccoon River, and at mile 245.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--994 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940, WDR IA-87-1:datum.

GAGE.--Water-stage recorder. Datum of gage is 888.88 ft above NGVD of 1929. Prior to June 12, 1946, nonrecording gage, June 12, 1946 to Sept. 30, 1986, water-stage recorder at site 2.4 mi upstream at datum 7.55 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	108	145	135	156	e108	e195	197	2,990	474	422	207	91
2	197	148	e120	149	e107	e175	199	1,990	797	387	198	89
3	526	153	e115	e113	e103	e184	198	1,340	610	371	198	78
4	536	153	e121	e123	e95	e146	198	2,850	731	361	190	76
5	1,510	155	e96	e117	e89	e141	201	7,220	345	344	194	73
6	580	158	e99	e109	e90	e154	195	5,080	363	463	194	71
7	409	154	e115	e105	e88	e167	208	3,570	651	1,240	192	74
8	362	151	e111	e121	e87	e157	237	2,840	e677	792	178	75
9	296	153	e99	e94	e83	e156	254	5,510	762	1,770	175	67
10	274	405	e94	e81	e81	e188	248	3,150	1,150	4,290	171	70
11	208	528	e104	e79	e88	e221	292	2,440	e950	2,630	193	83
12	264	381	e100	e84	e87	e255	400	2,080	e760	1,540	211	107
13	240	156	e106	e94	e90	e333	349	1,730	684	907	188	103
14	189	148	e122	e106	e107	e564	303	2,250	646	724	174	100
15	206	146	e137	e103	e121	e1,050	270	2,470	575	598	166	90
16	371	145	154	e91	e125	874	260	1,820	540	476	162	81
17	450	143	152	e88	e120	599	271	1,480	516	424	155	74
18	547	144	157	e99	e118	389	260	1,260	559	388	146	75
19	515	144	154	e108	e124	305	269	1,200	536	348	136	79
20	537	142	149	e105	e138	325	384	1,090	477	329	129	76
21	303	144	e140	e98	e215	310	410	938	426	321	124	82
22	140	142	e142	e96	e794	285	368	890	432	331	121	105
23	129	143	e133	e89	e333	252	307	832	e416	303	119	92
24	135	144	e136	e94	e307	227	315	798	404	280	117	84
25	151	128	e135	e92	e253	226	414	783	405	248	112	78
26	151	128	e139	e89	e204	216	415	722	540	230	106	70
27	142	134	e148	e91	e184	222	371	683	458	238	100	71
28	144	146	166	e92	e191	241	370	e605	457	254	98	71
29	146	165	161	e91	---	230	336	554	602	291	95	69
30	147	151	157	e95	---	217	4,330	519	527	268	95	65
31	145	---	e134	e99	---	210	---	514	---	251	92	---
TOTAL	10,058	5,277	4,031	3,151	4,530	9,214	12,829	62,198	17,470	21,819	4,736	2,419
MEAN	324	176	130	102	162	297	428	2,006	582	704	153	80.6
MAX	1,510	528	166	156	794	1,050	4,330	7,220	1,150	4,290	211	107
MIN	108	128	94	79	81	141	195	514	345	230	92	65
AC-FT	19,950	10,470	8,000	6,250	8,990	18,280	25,450	123,400	34,650	43,280	9,390	4,800
CFSM	0.33	0.18	0.13	0.10	0.16	0.30	0.43	2.02	0.59	0.71	0.15	0.08
IN.	0.38	0.20	0.15	0.12	0.17	0.34	0.48	2.33	0.65	0.82	0.18	0.09

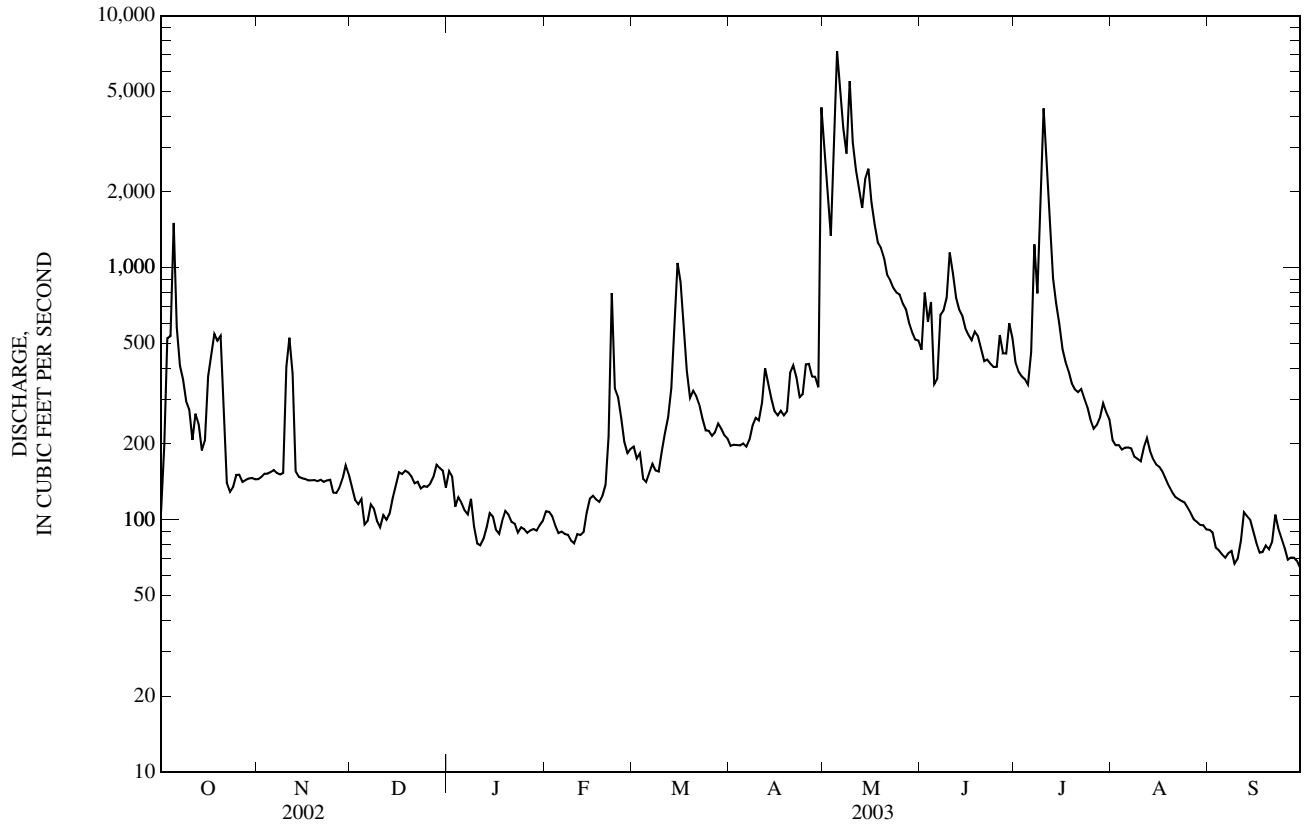
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	233	233	191	173	387	814	752	892	1,029	646	367	278
MAX	1,501	1,162	826	565	1,785	3,112	2,474	3,005	5,017	5,494	2,745	1,385
(WY)	(1987)	(1973)	(1993)	(1983)	(1971)	(1979)	(1984)	(1974)	(1947)	(1993)	(1993)	(1993)
MIN	28.6	36.2	32.4	30.4	35.5	74.2	50.0	62.9	43.2	57.4	37.8	36.0
(WY)	(1941)	(1956)	(1956)	(1950)	(1956)	(1981)	(1956)	(1967)	(1977)	(1954)	(1955)	(1955)

05484000 SOUTH RACCOON RIVER AT REDFIELD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	96,334		157,732			
ANNUAL MEAN	264		432		500	
HIGHEST ANNUAL MEAN					1,632	1993
LOWEST ANNUAL MEAN					91.4	1968
HIGHEST DAILY MEAN	3,180	Jun 13	7,220	May 5	33,600	Jul 10, 1993
LOWEST DAILY MEAN	47	Feb 28	65	Sep 30	17	Aug 4, 1977
ANNUAL SEVEN-DAY MINIMUM	59	Feb 26	72	Sep 4	20	Jan 24, 1954
MAXIMUM PEAK FLOW			8,430	May 5	44,000	Jul 10, 1993
MAXIMUM PEAK STAGE			11.86	May 5	29.04	Jul 2, 1958
INSTANTANEOUS LOW FLOW			63	Sep 30		
ANNUAL RUNOFF (AC-FT)	191,100		312,900		361,900	
ANNUAL RUNOFF (CFSM)	0.27		0.43		0.50	
ANNUAL RUNOFF (INCHES)	3.61		5.90		6.83	
10 PERCENT EXCEEDS	515		797		1,110	
50 PERCENT EXCEEDS	147		189		202	
90 PERCENT EXCEEDS	84		90		60	

e Estimated



05484500 RACCOON RIVER AT VAN METER, IA

LOCATION.--Lat 41°32'02", long 93°56'59", in SW¼ SW¼ sec.22, T.78 N., R.27 W., Dallas County, Hydrologic Unit 07100006, on right bank 10 ft downstream from bridge on county highway R16, 0.3 mi northeast of Van Meter, 0.7 mi upstream from small left bank tributary, 1.1 mi downstream from confluence of North and South Raccoon Rivers, 29.1 mi upstream from mouth, and at mile 230.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--3,441 mi^2.

PERIOD OF RECORD.--April 1915 to current year. Prior to October 1934, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1927 (M), WSP 1438: Drainage area, WSP 1508: 1915 (M), 1925 (M), 1926, 1933 (M), 1939 (M), 1947 (M), 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 841.16 ft above NGVD of 1929. See WSP 1308 for history of changes prior to Aug. 8, 1934.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	294	836	e484	e502	e315	e372	624	6,640	1,740	5,360	886	251
2	365	877	528	e491	e303	e254	651	5,780	1,900	4,350	808	245
3	656	875	510	460	e294	e292	645	5,930	1,770	3,650	757	231
4	743	862	e446	500	e274	e254	635	8,130	1,900	3,050	716	219
5	1,890	852	e416	460	e290	e265	636	16,400	1,600	2,620	678	211
6	2,580	836	e355	476	e280	e256	633	14,500	1,570	3,270	644	207
7	2,560	815	e490	468	e250	e298	655	e13,900	1,810	6,990	614	208
8	2,340	790	e512	472	e274	e304	686	14,000	1,920	7,840	577	212
9	1,880	774	e483	e465	e257	e298	700	18,000	2,180	8,910	557	202
10	1,570	884	e541	e395	e267	e286	719	13,100	3,650	12,600	548	195
11	1,310	1,110	547	e380	e270	e352	778	11,000	3,410	14,200	549	227
12	1,230	1,060	575	e373	e284	e536	983	9,790	3,060	e14,900	619	267
13	1,120	781	596	e385	e287	e752	1,210	8,870	2,760	e15,000	573	264
14	1,010	695	592	e365	e321	e769	1,480	9,080	2,580	e14,400	527	252
15	933	677	567	e349	e314	e1,140	1,450	10,300	2,290	12,200	487	243
16	1,020	668	559	e373	e287	e1,180	1,330	8,740	2,060	7,290	467	240
17	1,110	659	559	e330	e250	e1,070	1,250	7,370	1,880	5,050	438	229
18	1,160	649	568	e365	e300	e1,090	1,170	6,160	1,820	3,950	409	218
19	1,140	645	576	e356	e270	1,170	1,130	5,310	1,890	3,310	384	216
20	1,130	639	e521	e352	e368	994	1,230	4,700	1,760	2,850	367	203
21	997	634	e540	e308	e519	880	1,370	4,070	1,540	2,470	352	214
22	729	622	e491	e310	e623	777	1,520	3,670	1,430	2,170	343	243
23	678	615	e393	e284	e559	699	1,510	3,430	1,370	1,980	331	234
24	675	608	e329	e310	e327	632	1,470	3,230	1,300	1,870	325	214
25	690	590	364	e318	e93	596	1,550	3,020	1,260	1,640	314	206
26	677	570	442	e309	e186	571	1,570	2,780	1,390	1,460	307	196
27	664	523	663	e320	e251	569	1,530	2,550	2,910	1,320	299	190
28	668	e478	566	e312	e314	584	1,530	2,310	5,420	1,250	291	182
29	677	550	545	e308	---	586	1,470	2,130	7,120	1,240	275	179
30	694	e580	523	e315	---	579	6,400	1,980	6,700	1,100	268	172
31	760	---	515	e322	---	587	---	1,870	---	1,000	264	---
TOTAL	33,950	21,754	15,796	11,733	8,627	18,992	38,515	228,740	73,990	169,290	14,974	6,570
MEAN	1,095	725	510	378	308	613	1,284	7,379	2,466	5,461	483	219
MAX	2,580	1,110	663	502	623	1,180	6,400	18,000	7,120	15,000	886	267
MIN	294	478	329	284	93	254	624	1,870	1,260	1,000	264	172
AC-FT	67,340	43,150	31,330	23,270	17,110	37,670	76,390	453,700	146,800	335,800	29,700	13,030
CFSM	0.32	0.21	0.15	0.11	0.09	0.18	0.37	2.14	0.72	1.59	0.14	0.06
IN.	0.37	0.24	0.17	0.13	0.09	0.21	0.42	2.47	0.80	1.83	0.16	0.07

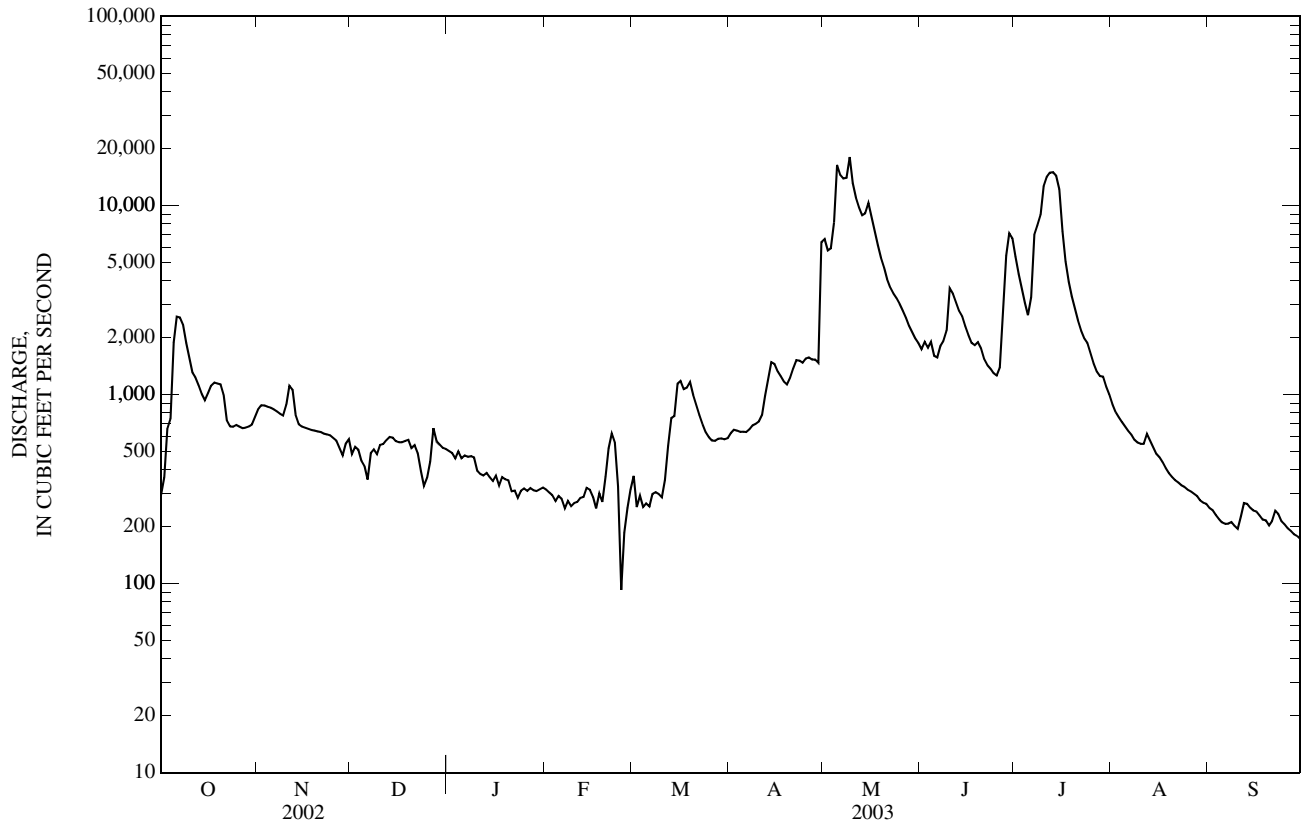
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1916 - 2003, BY WATER YEAR (WY)

MEAN	815	763	566	485	976	2,580	2,619	2,710	3,298	1,921	996	851
MAX	6,840	4,774	3,085	3,461	5,438	10,480	10,630	9,257	13,970	17,260	7,414	7,222
(WY)	(1974)	(1973)	(1983)	(1932)	(1984)	(1979)	(1983)	(1984)	(1947)	(1993)	(1993)	(1926)
MIN	48.6	51.5	31.0	17.2	31.5	146	125	121	112	68.1	28.1	43.1
(WY)	(1940)	(1938)	(1938)	(1940)	(1940)	(1931)	(1956)	(1934)	(1977)	(1936)	(1936)	(1939)

05484500 RACCOON RIVER AT VAN METER, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1916 - 2003	
ANNUAL TOTAL	398,585		642,931			
ANNUAL MEAN	1,092		1,761		1,549	
HIGHEST ANNUAL MEAN					5,717	1993
LOWEST ANNUAL MEAN					166	1956
HIGHEST DAILY MEAN	7,730	May 14	18,000	May 9	57,500	Jul 10, 1993
LOWEST DAILY MEAN	182	Mar 2	93	Feb 25a	10	Jan 22, 1940b
ANNUAL SEVEN-DAY MINIMUM	274	Feb 26	191	Sep 24	10	Jan 22, 1940
MAXIMUM PEAK FLOW			20,300	May 9	70,100	Jul 10, 1993
MAXIMUM PEAK STAGE			16.51	May 9	26.34	Jul 10, 1993
INSTANTANEOUS LOW FLOW					10	Jan 22, 1940
ANNUAL RUNOFF (AC-FT)	790,600		1,275,000		1,122,000	
ANNUAL RUNOFF (CFSM)	0.32		0.51		0.45	
ANNUAL RUNOFF (INCHES)	4.31		6.95		6.12	
10 PERCENT EXCEEDS	2,460		4,490		3,920	
50 PERCENT EXCEEDS	617		645		600	
90 PERCENT EXCEEDS	367		257		117	

a Ice affected.
b Also Jan. 23-31, 1940.
e Estimated.



05484600 RACCOON RIVER NEAR WEST DES MOINES, IA

LOCATION.--Lat 41°31'54", long 93°46'54", in SE¼ NE¼ sec.30, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on right bank, 0.4 mile upstream of bridge on Interstate 35, 13.1 mi. upstream from mouth of Raccoon River, and at mile 215.9 upstream from mouth of Des Moines River.

DRAINAGE AREA.--3,500 mi^2.

PERIOD OF RECORD.--July 19, 2000 to current year.

GAGE.--Water-stage recorder. Datum of gage is 782.967 ft above NGVD of 1929.

REMARKS.--Records good. Discharge not published, low-flow use only. U.S. Geological Survey satellite data collection platform and rain gage at station.

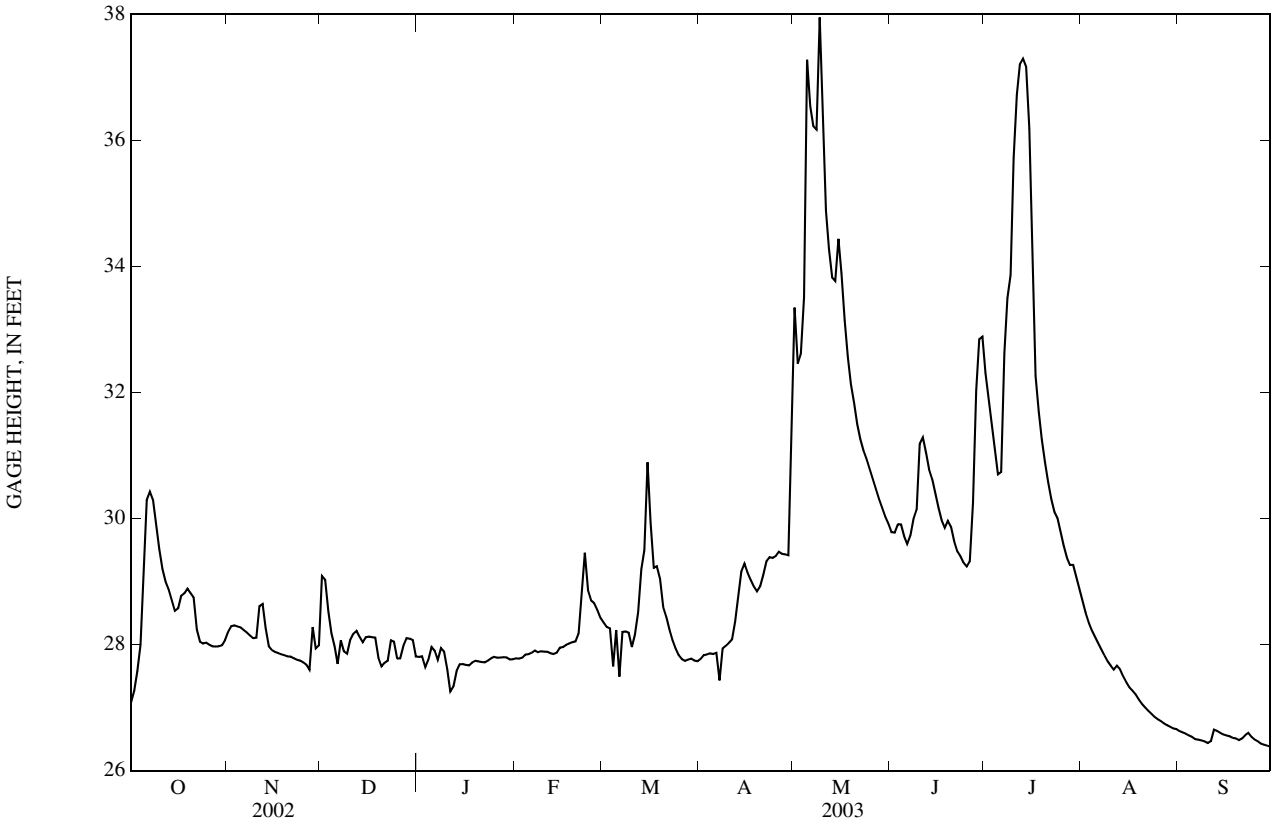
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 38.80 ft. May 9, 2003; minimum gage height, 26.14 ft. Dec. 5,2000.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 38.80 ft. May 9; minimum gage height, 26.36 ft. Sept. 30.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27.08	28.20	29.09	27.81	27.78	28.35	27.77	33.35	29.79	32.31	28.70	26.63
2	27.27	28.29	29.03	27.81	27.78	28.28	27.83	32.46	29.78	31.84	28.51	26.61
3	27.58	28.30	28.53	27.64	27.79	28.26	27.84	32.61	29.91	31.44	28.35	26.59
4	28.00	28.29	28.18	27.76	27.84	27.66	27.86	33.51	29.91	31.04	28.23	26.56
5	29.05	28.27	27.97	27.96	27.85	28.23	27.85	37.28	29.72	30.70	28.13	26.54
6	30.30	28.23	27.69	27.90	27.87	27.49	27.87	36.54	29.60	30.74	28.03	26.50
7	30.43	28.19	28.07	27.76	27.91	28.20	27.43	36.22	29.73	32.62	27.93	26.49
8	30.30	28.14	27.89	27.94	27.88	28.21	27.94	36.17	29.99	33.49	27.83	26.48
9	29.90	28.10	27.85	27.89	27.89	28.19	27.98	37.95	30.14	33.86	27.74	26.46
10	29.52	28.11	28.07	27.61	27.89	27.96	28.03	36.17	31.18	35.72	27.66	26.44
11	29.20	28.61	28.17	27.26	27.89	28.16	28.08	34.88	31.29	36.72	27.60	26.47
12	29.01	28.65	28.22	27.34	27.86	28.51	28.36	34.27	31.04	37.21	27.67	26.65
13	28.88	28.26	28.12	27.58	27.85	29.19	28.77	33.82	30.78	37.30	27.61	26.63
14	28.70	27.97	28.04	27.69	27.87	29.50	29.16	33.77	30.62	37.17	27.50	26.60
15	28.54	27.91	28.12	27.69	27.95	30.89	29.29	34.44	30.39	36.19	27.40	26.57
16	28.57	27.88	28.13	27.68	27.96	29.93	29.14	33.89	30.17	33.67	27.32	26.56
17	28.77	27.86	28.12	27.67	27.99	29.22	29.03	33.15	29.98	32.27	27.27	26.55
18	28.81	27.85	28.11	27.72	28.02	29.24	28.92	32.56	29.85	31.70	27.21	26.52
19	28.89	27.83	27.79	27.74	28.04	29.04	28.84	32.13	29.96	31.26	27.13	26.51
20	28.81	27.81	27.65	27.73	28.05	28.59	28.93	31.83	29.87	30.89	27.06	26.49
21	28.75	27.81	27.71	27.72	28.18	28.44	29.10	31.50	29.64	30.59	27.00	26.51
22	28.24	27.78	27.74	27.72	28.78	28.24	29.32	31.26	29.48	30.31	26.95	26.56
23	28.05	27.76	28.07	27.75	29.46	28.08	29.39	31.09	29.40	30.11	26.90	26.60
24	28.02	27.75	28.04	27.78	28.86	27.94	29.38	30.95	29.30	30.01	26.86	26.54
25	28.03	27.72	27.78	27.80	28.70	27.83	29.41	30.80	29.24	29.79	26.82	26.50
26	28.00	27.68	27.78	27.79	28.66	27.77	29.47	30.64	29.32	29.57	26.79	26.47
27	27.97	27.60	27.98	27.79	28.55	27.74	29.44	30.47	30.25	29.38	26.75	26.43
28	27.97	28.28	28.10	27.80	28.42	27.76	29.43	30.31	32.03	29.26	26.72	26.41
29	27.97	27.94	28.09	27.80	---	27.78	29.42	30.17	32.85	29.26	26.70	26.40
30	27.99	27.99	28.07	27.76	---	27.75	31.77	30.03	32.88	29.09	26.67	26.38
31	28.07	---	27.81	27.77	---	27.74	---	29.92	---	28.89	26.66	---
MEAN	28.60	28.04	28.06	27.73	28.13	28.39	28.77	33.04	30.27	32.08	27.41	26.52
MAX	30.43	28.65	29.09	27.96	29.46	30.89	31.77	37.95	32.88	37.30	28.70	26.65
MIN	27.08	27.60	27.65	27.26	27.78	27.49	27.43	29.92	29.24	28.89	26.66	26.38

05484600 RACCOON RIVER NEAR WEST DES MOINES, IA—Continued



05484650 RACCOON RIVER AT 63RD STREET, DES MOINES, IA

LOCATION.--Lat 41°33'49", long 93°42'13", in SW¼ NE¼ sec.14, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, at upstream side of bridge on State Highway 28, 2.9 mi. upstream from Walnut Creek, 8.6 mi. upstream from mouth of Raccoon River, and at mile 210.0 upstream from mouth of Des Moines River.

DRAINAGE AREA.-- 3,529 mi^2.

PERIOD OF RECORD.-- October 1991 to current year. October 1991 to September 1996 gage height record only.

GAGE.--Water-stage recorder. Datum of gage is 773.91 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service Limited Automatic Remote Collector (LARC) and U.S. Army Corps of Engineers rain gage and U.S. Geological Survey satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	335	e950	497	518	e333	e350	779	6,450	2,970	5,720	1,650	328
2	598	e980	551	e506	e319	e325	817	4,320	2,930	4,960	1,520	316
3	639	e974	551	e481	e317	e312	837	4,500	3,080	4,440	1,400	306
4	946	e964	463	e518	e298	e300	845	6,580	3,030	4,020	1,300	292
5	1,440	e930	431	e480	e307	e346	857	15,700	2,930	3,700	1,220	283
6	2,230	e899	372	491	e300	e333	877	14,700	2,800	3,660	1,150	274
7	2,330	908	509	478	e276	e380	917	13,900	2,860	5,850	1,070	268
8	2,270	888	529	e500	e288	e433	947	13,700	3,080	7,370	999	262
9	2,070	871	501	e480	e283	e440	968	18,400	3,170	7,940	938	255
10	1,850	862	574	e420	e290	e413	1,010	15,000	4,140	11,300	e900	243
11	1,710	1,100	584	e395	e300	e487	1,060	10,900	4,320	13,900	e847	253
12	1,570	1,160	605	e403	e305	e621	1,200	9,150	4,060	15,100	789	305
13	1,460	984	615	e400	e311	e729	1,460	8,140	3,750	15,700	749	289
14	1,380	816	588	e400	e333	e856	1,740	7,920	3,590	15,400	690	282
15	1,290	776	e585	e378	e323	e1,220	1,880	9,250	3,440	13,500	643	270
16	1,280	756	e565	e393	e301	e1,290	1,780	8,370	3,240	8,650	605	262
17	1,390	737	571	e353	e272	e1,140	1,690	7,020	3,080	6,150	574	253
18	1,450	722	580	e382	e323	e1,140	1,600	6,190	2,950	5,290	538	245
19	1,470	713	583	e368	e308	e1,120	1,550	5,580	3,010	4,460	509	243
20	1,410	704	536	e364	e350	1,040	1,540	5,180	2,940	3,910	e486	231
21	1,400	697	557	e321	e500	967	1,610	4,790	2,770	3,610	e472	248
22	1,110	683	523	e325	e600	870	1,710	4,380	2,620	3,350	e460	246
23	953	670	423	e300	e575	804	1,730	4,180	2,520	3,060	450	251
24	929	659	346	e325	e386	751	1,730	4,020	2,440	2,920	446	231
25	970	640	e405	e337	e250	698	1,670	3,880	2,440	2,690	435	217
26	939	635	e469	e328	e275	677	1,660	3,730	2,460	2,470	421	211
27	900	606	e695	e342	e282	680	1,600	3,560	3,100	2,290	396	201
28	902	494	e612	e330	e336	689	1,550	3,440	5,160	2,160	373	194
29	907	561	e576	e330	---	708	1,500	3,350	6,460	2,100	360	188
30	852	597	e548	e332	---	711	4,010	3,220	6,590	1,970	348	182
31	898	---	e534	e338	---	723	---	3,060	---	1,800	341	---
TOTAL	39,878	23,936	16,478	12,316	9,341	21,553	43,124	232,560	101,930	189,440	23,079	7,629
MEAN	1,286	798	532	397	334	695	1,437	7,502	3,398	6,111	744	254
MAX	2,330	1,160	695	518	600	1,290	4,010	18,400	6,590	15,700	1,650	328
MIN	335	494	346	300	250	300	779	3,060	2,440	1,800	341	182
AC-FT	79,100	47,480	32,680	24,430	18,530	42,750	85,540	461,300	202,200	375,800	45,780	15,130
CFSM	0.36	0.23	0.15	0.11	0.09	0.20	0.41	2.13	0.96	1.73	0.21	0.07
IN.	0.42	0.25	0.17	0.13	0.10	0.23	0.45	2.45	1.07	2.00	0.24	0.08

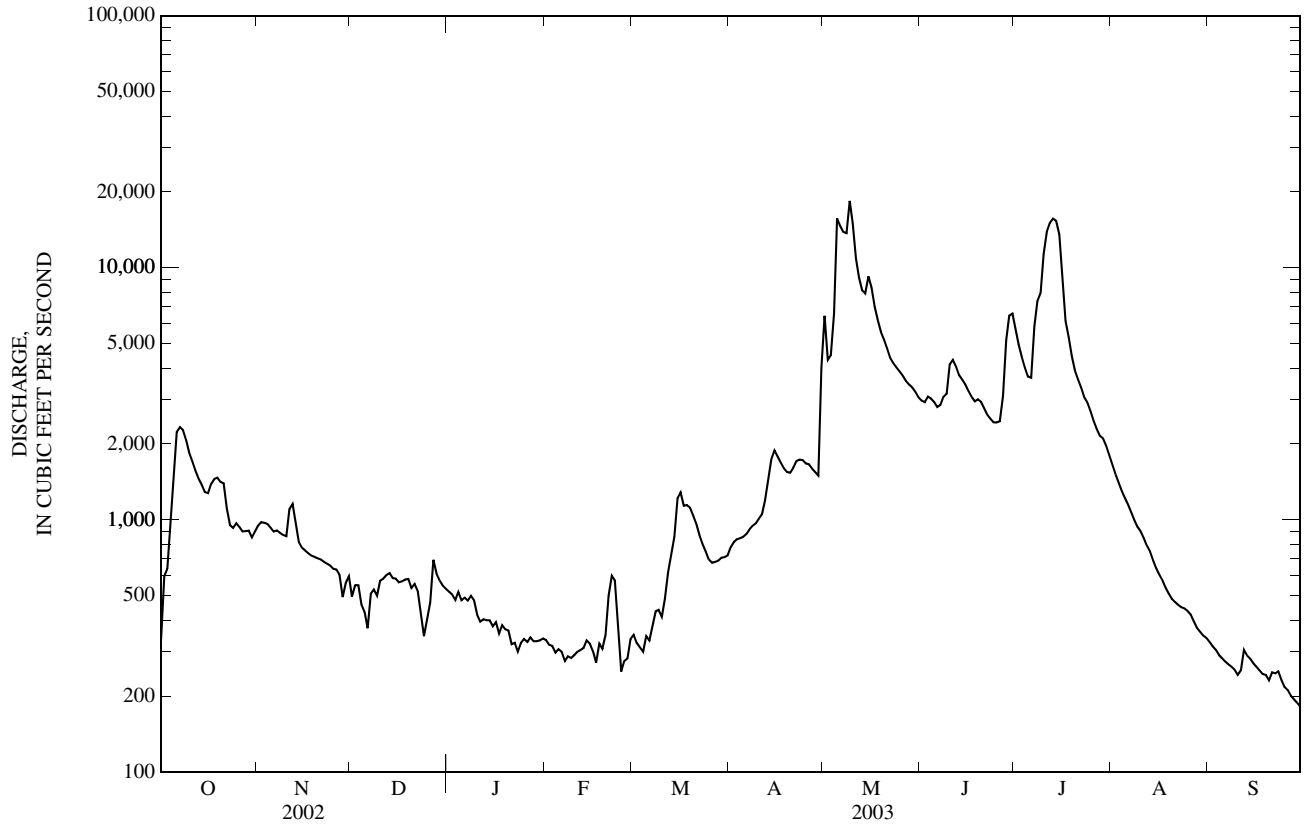
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2003, BY WATER YEAR (WY)

MEAN	610	797	646	470	1,086	2,090	3,687	4,791	4,864	3,188	1,119	416
MAX	1,286	2,484	1,873	1,236	3,205	4,914	9,591	7,830	12,460	7,560	2,220	694
(WY)	(2003)	(1997)	(1997)	(1997)	(1997)	(2001)	(1999)	(1999)	(1998)	(1998)	(1998)	(1998)
MIN	124	246	148	200	211	407	281	334	603	714	339	164
(WY)	(2001)	(2001)	(2001)	(2001)	(2001)	(2000)	(2000)	(2000)	(2000)	(2002)	(2000)	(2000)

05484650 RACCOON RIVER AT 63RD STREET, DES MOINES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1997 - 2003	
ANNUAL TOTAL	396,248		721,264			
ANNUAL MEAN	1,086		1,976		1,982	
HIGHEST ANNUAL MEAN					3,352	1998
LOWEST ANNUAL MEAN					375	2000
HIGHEST DAILY MEAN	7,010	May 14	18,400	May 9	36,300	Jun 16, 1998
LOWEST DAILY MEAN	201	Mar 2	182	Sep 30	80	Dec 25, 2000
ANNUAL SEVEN-DAY MINIMUM	281	Feb 26	203	Sep 24	94	Dec 20, 2000
MAXIMUM PEAK FLOW			21,100	May 9	40,300	Jun 16, 1998
MAXIMUM PEAK STAGE			35.19	May 9	40.77	Jul 11, 1993
INSTANTANEOUS LOW FLOW			179	Sep 30		
ANNUAL RUNOFF (AC-FT)	786,000		1,431,000		1,436,000	
ANNUAL RUNOFF (CFSM)	0.31		0.56		0.56	
ANNUAL RUNOFF (INCHES)	4.18		7.60		7.63	
10 PERCENT EXCEEDS	2,290		4,620		5,190	
50 PERCENT EXCEEDS	650		816		703	
90 PERCENT EXCEEDS	370		300		245	

e Estimated



05484800 WALNUT CREEK AT DES MOINES, IA

LOCATION.--Lat 41°35'14", long 93°42'11", in SW¼ SE¼ sec.2, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, 25 ft downstream from bridge on 63rd Street in Des Moines, and 2.2 mi upstream from Raccoon River.

DRAINAGE AREA.--78.4 mi^2.

PERIOD OF RECORD.--October 1971 to current year.

REVISED RECORDS.--WDR IA-73-1: 1972. WDR IA-75-1: 1973-74.

GAGE.--Water-stage recorder. Datum of gage is 801.04 ft above NGVD of 1929 (levels by Iowa Natural Resources Council).

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service Limited Automatic Remote Collector (LARC) and U.S. Geological Survey satellite data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	e13	e2.8	e2.3	e6.9	e5.6	3.3	377	33	21	4.8	1.2
2	268	e12	e2.1	e2.1	e5.0	e2.1	3.4	140	47	20	3.9	0.74
3	47	e10	e1.6	e2.0	e3.3	e2.6	3.5	97	51	19	2.9	0.65
4	55	e8.9	e1.6	e2.2	e2.2	e2.4	11	1,680	36	18	2.3	0.54
5	32	e15	e1.6	e2.4	e1.6	e1.8	5.7	1,110	36	85	8.0	0.49
6	24	e12	e1.8	e2.1	e1.2	e3.2	5.7	289	72	98	3.6	0.45
7	22	e7.6	e2.0	e2.1	e0.96	e6.3	25	272	61	64	3.0	0.46
8	20	e6.7	e2.0	e2.3	e1.6	e5.5	18	249	66	54	2.4	0.44
9	19	e6.2	e1.8	e2.1	e1.4	e4.7	16	891	45	197	1.7	0.44
10	19	e4.8	e1.8	e1.6	e1.4	e3.0	9.6	232	151	94	3.4	0.44
11	18	e3.6	e2.2	e1.4	e1.6	e16	6.8	152	76	54	11	50
12	20	e2.9	e2.5	e1.2	e0.96	e32	5.8	115	57	40	2.5	30
13	20	e2.2	e2.5	e1.0	e1.8	e61	5.6	116	49	33	1.7	16
14	19	e2.5	e2.5	e1.1	e8.1	e91	5.3	221	42	29	1.3	12
15	19	e2.2	e2.4	e0.99	e5.3	113	6.3	117	38	41	1.1	4.0
16	19	e2.1	e2.3	e0.91	e3.6	41	12	96	36	25	0.85	2.2
17	21	e2.0	e2.2	e0.97	e1.6	24	5.6	85	34	22	0.83	1.7
18	20	e2.1	e2.4	e1.1	e9.6	18	7.4	77	32	20	0.97	15
19	21	e2.5	e2.4	e0.96	e8.2	29	85	73	32	18	0.79	12
20	20	e2.5	e2.2	e0.99	e12	24	46	68	28	17	1.6	3.2
21	24	e2.7	2.3	e0.89	e11	12	22	63	25	16	0.74	54
22	20	e2.9	e1.9	e0.70	e9.1	7.0	17	60	24	11	0.66	22
23	19	e2.5	e1.7	e0.23	e7.0	5.5	16	57	23	11	0.60	7.2
24	40	e2.7	e1.6	e0.23	e4.1	5.2	89	54	22	9.3	0.55	3.9
25	77	e2.3	e1.5	e0.28	e2.4	4.2	44	51	75	8.4	0.58	2.3
26	32	e2.1	e1.5	e0.51	e4.0	3.9	27	47	38	7.3	0.55	1.6
27	e27	e2.1	e1.8	e0.79	e5.3	8.0	22	45	23	9.5	0.62	1.4
28	e31	e2.4	e2.3	e1.1	e5.5	7.3	67	45	92	16	0.55	1.1
29	e22	e2.6	2.7	e3.0	---	4.6	47	41	29	7.1	0.53	1.1
30	e18	e3.1	2.9	e3.0	---	3.5	952	40	22	11	0.50	0.97
31	e16	---	e2.5	e13	---	3.1	---	36	---	7.3	0.70	---
TOTAL	1,073	146.2	65.4	55.55	126.72	550.5	1,590.0	6,996	1,395	1,082.9	65.22	247.52
MEAN	34.6	4.87	2.11	1.79	4.53	17.8	53.0	226	46.5	34.9	2.10	8.25
MAX	268	15	2.9	13	12	113	952	1,680	151	197	11	54
MIN	16	2.0	1.5	0.23	0.96	1.8	3.3	36	22	7.1	0.50	0.44
AC-FT	2,130	290	130	110	251	1,090	3,150	13,880	2,770	2,150	129	491
CFSM	0.44	0.06	0.03	0.02	0.06	0.23	0.68	2.88	0.59	0.45	0.03	0.11
IN.	0.51	0.07	0.03	0.03	0.06	0.26	0.75	3.32	0.66	0.51	0.03	0.12

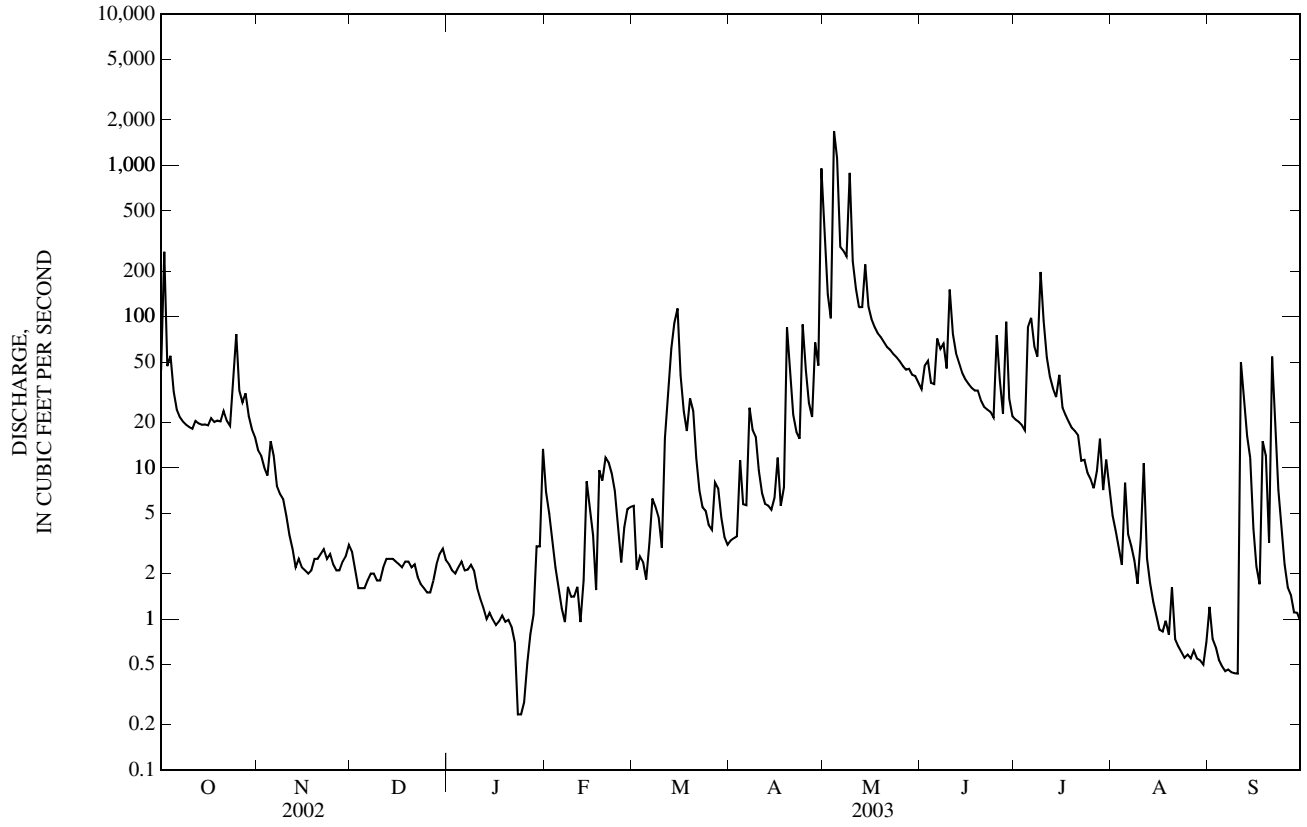
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2003, BY WATER YEAR (WY)

MEAN	30.3	34.9	28.5	20.9	41.6	70.2	96.2	123	118	79.3	44.4	29.1
MAX	166	147	119	123	178	214	310	390	385	427	329	214
(WY)	(1974)	(1973)	(1983)	(1974)	(1973)	(1990)	(1973)	(1996)	(1990)	(1993)	(1993)	(1993)
MIN	1.33	0.88	0.17	0.001	0.48	3.17	2.72	6.36	7.62	2.96	2.10	0.57
(WY)	(1972)	(1977)	(1977)	(1977)	(1977)	(1981)	(1981)	(1977)	(1977)	(1985)	(2003)	(1976)

05484800 WALNUT CREEK AT DES MOINES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1972 - 2003	
ANNUAL TOTAL	8,526.9		13,394.01			
ANNUAL MEAN	23.4		36.7		59.7	
HIGHEST ANNUAL MEAN					158	1993
LOWEST ANNUAL MEAN					10.3	1989
HIGHEST DAILY MEAN	573	Jul 10	1,680	May 4	4,520	Jul 1, 1973
LOWEST DAILY MEAN	1.4	Mar 3	0.23	Jan 23a	0.00	Jan 3, 1977b
ANNUAL SEVEN-DAY MINIMUM	1.8	Dec 21	0.47	Sep 4	0.00	Jan 3, 1977
MAXIMUM PEAK FLOW			3,240	May 4	12,500	May 10, 1986
MAXIMUM PEAK STAGE			13.11	May 4	18.32	May 10, 1986
ANNUAL RUNOFF (AC-FT)	16,910		26,570		43,260	
ANNUAL RUNOFF (CFSM)	0.30		0.47		0.76	
ANNUAL RUNOFF (INCHES)	4.05		6.36		10.35	
10 PERCENT EXCEEDS	43		67		141	
50 PERCENT EXCEEDS	7.5		6.9		22	
90 PERCENT EXCEEDS	2.2		0.97		2.3	

a Also Jan. 24; Ice affected.
b Many days in 1977, Aug. 21, 1994, many days in 2000, and Aug. 14, 2001.
e Estimated.



05484900 RACCOON RIVER AT FLEUR DRIVE, DES MOINES, IA

LOCATION.--Lat 41°34'54", long 93°38'34", in NW$\frac{1}{4}$ NE$\frac{1}{4}$ sec.8, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100006, on downstream side of Fleur Drive bridge(SW 18th St.) attached to handrail 465 ft. from right edge of bridge, 3.0 miles downstream from Walnut Creek, 2.6 miles upstream from mouth, and at mile 204.1 above mouth of Des Moines River.

DRAINAGE AREA.-- 3,625 mi^2.

PERIOD OF RECORD.-- June 1984 to current year; June 1984 to September 1996 gage-height record only.

GAGE.--Water-stage recorder. Datum of gage is 780.70 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Discharges are affected by withdrawal by Des Moines Water Works. U.S. Geological Survey satellite data collection platform and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	258	e817	e286	e283	e190	e245	675	7,920	2,460	5,880	1,450	e288
2	570	e866	e348	e286	e189	e215	715	5,320	2,380	5,140	1,310	e286
3	e671	e850	e283	e200	e199	e212	734	5,410	2,640	4,480	1,190	e267
4	e959	e850	e165	e182	e189	e256	745	8,580	2,500	3,900	1,110	e254
5	e1,350	e801	e159	e357	e193	e324	727	16,700	2,460	3,550	1,050	e237
6	1,960	e784	e161	e336	e171	e288	737	15,500	2,320	3,430	960	e227
7	2,280	e801	e289	e262	e157	e310	792	14,600	2,340	5,350	903	e227
8	2,140	e768	e314	e337	e158	e324	798	14,300	2,660	7,150	846	e231
9	e1,910	721	e190	e336	e153	e317	815	18,600	2,700	7,870	787	e223
10	e1,670	717	e314	e190	e155	e281	837	16,000	3,880	11,500	748	e214
11	e1,490	885	e425	e158	e164	e334	856	11,400	4,160	14,600	731	e240
12	e1,320	961	e487	e125	e168	e521	981	9,910	3,830	16,100	708	296
13	e1,270	864	e462	e193	e168	e699	1,280	8,660	3,470	16,700	698	241
14	e1,220	718	e394	e226	e178	e840	1,580	8,550	3,260	16,500	632	234
15	e1,160	693	e415	e221	e171	e1,160	1,790	9,780	3,040	14,400	583	211
16	e1,140	690	e467	e198	e146	e1,250	1,690	8,870	2,780	8,600	539	193
17	e1,270	693	e512	e193	e128	e1,110	1,570	7,120	2,580	5,270	500	175
18	e1,300	682	e482	e190	e113	e1,120	1,500	6,020	2,440	4,490	469	180
19	e1,320	e680	e463	e186	e113	e1,090	1,590	5,400	2,510	3,980	e445	190
20	e1,270	e668	e401	e201	e142	1,100	1,560	5,020	2,470	3,600	e424	171
21	e1,250	e668	e379	e227	e230	1,220	1,620	4,610	2,270	3,300	e406	241
22	e870	e646	e297	e209	e347	1,060	1,790	4,240	2,110	2,970	e395	221
23	e815	e617	e192	e209	e299	955	1,880	3,980	2,050	2,740	e386	220
24	e804	e595	e180	e218	e204	852	2,040	3,770	1,960	2,680	e382	212
25	e815	e589	e134	e233	e43	761	1,940	3,580	2,030	2,480	e371	199
26	e815	e569	e100	e217	e149	710	1,950	3,390	2,030	2,250	e360	192
27	e782	e504	e201	e224	e219	689	1,930	3,170	2,550	2,060	e342	181
28	e782	e210	e319	e209	e314	680	1,970	3,000	5,020	1,940	e323	173
29	e804	e292	e336	e199	---	688	1,930	2,850	6,440	1,900	e311	155
30	e771	e363	e387	e190	---	679	4,990	2,700	6,930	1,770	e304	146
31	e815	---	e325	e195	---	668	---	2,570	---	1,600	e303	---
TOTAL	35,851	20,562	9,867	6,990	5,050	20,958	44,012	241,520	90,270	188,180	19,966	6,525
MEAN	1,156	685	318	225	180	676	1,467	7,791	3,009	6,070	644	218
MAX	2,280	961	512	357	347	1,250	4,990	18,600	6,930	16,700	1,450	296
MIN	258	210	100	125	43	212	675	2,570	1,960	1,600	303	146
AC-FT	71,110	40,780	19,570	13,860	10,020	41,570	87,300	479,100	179,100	373,300	39,600	12,940
CFSM	0.32	0.19	0.09	0.06	0.05	0.19	0.40	2.15	0.83	1.67	0.18	0.06
IN.	0.37	0.21	0.10	0.07	0.05	0.22	0.45	2.48	0.93	1.93	0.20	0.07

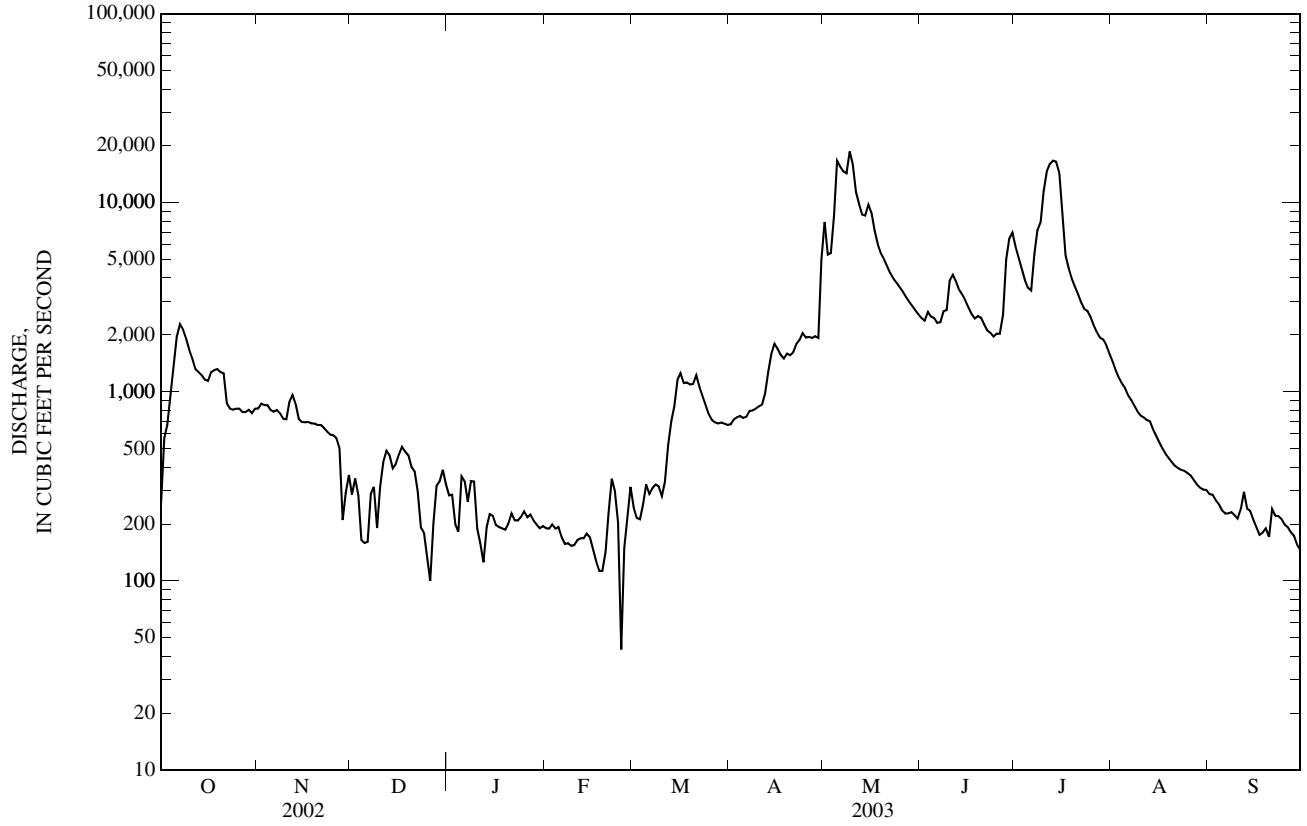
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2003, BY WATER YEAR (WY)

MEAN	580	782	599	431	1,073	2,080	3,793	4,901	4,895	3,179	1,101	388
MAX	1,156	2,527	1,873	1,235	3,280	4,877	9,905	7,915	12,570	7,266	2,252	664
(WY)	(2003)	(1997)	(1997)	(1997)	(1997)	(2001)	(1999)	(1999)	(1998)	(1998)	(1998)	(1998)
MIN	120	265	177	169	180	349	277	370	671	670	334	124
(WY)	(2001)	(2000)	(2001)	(2000)	(2003)	(2000)	(2000)	(2000)	(2000)	(2002)	(2000)	(2000)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1997 - 2003	
ANNUAL TOTAL	387,384		689,751			
ANNUAL MEAN	1,061		1,890		1,985	
HIGHEST ANNUAL MEAN					3,350	1998
LOWEST ANNUAL MEAN					381	2000
HIGHEST DAILY MEAN	6,910	May 14	18,600	May 9	40,100	Jun 16, 1998
LOWEST DAILY MEAN	100	Dec 26	43	Feb 25a	43	Feb 25, 2003
ANNUAL SEVEN-DAY MINIMUM	203	Dec 22	142	Feb 14	85	Sep 28, 2000
MAXIMUM PEAK FLOW			20,800	May 9	45,000	Jun 16, 1998
MAXIMUM PEAK STAGE			14.84	May 9	26.80	Jul 11, 1993
ANNUAL RUNOFF (AC-FT)	768,400		1,368,000		1,438,000	
ANNUAL RUNOFF (CFSM)	0.29		0.52		0.55	
ANNUAL RUNOFF (INCHES)	3.98		7.08		7.44	
10 PERCENT EXCEEDS	2,420		5,000		5,260	
50 PERCENT EXCEEDS	631		721		677	
90 PERCENT EXCEEDS	298		190		210	

05484900 RACCOON RIVER AT FLEUR DRIVE, DES MOINES, IA—Continued

a Ice affected.
e Estimated.



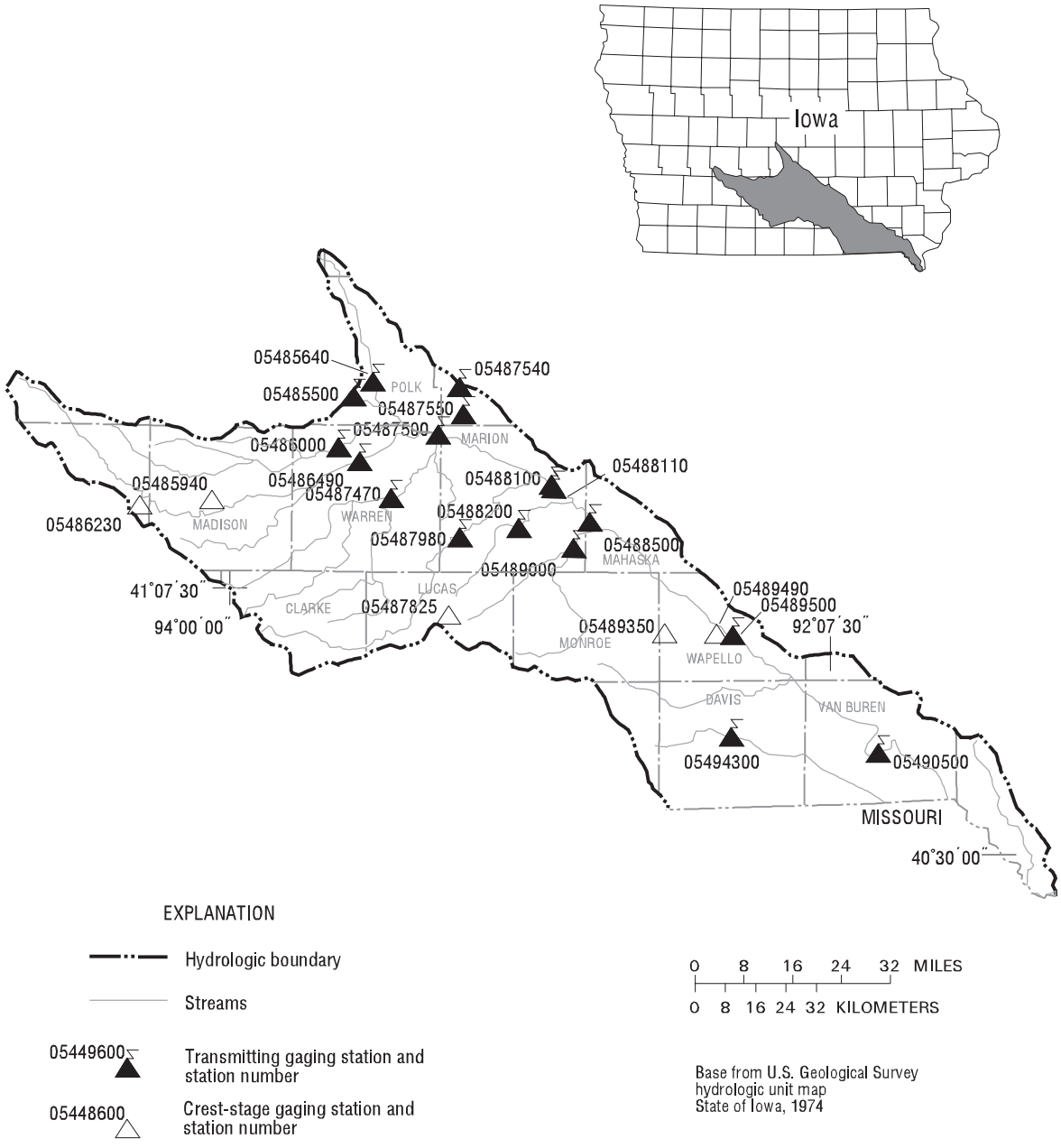


Figure 14. Locations of active continuous-record and crest-stage gaging stations in the Lower Des Moines River and Fox River drainage basins.

Gaging Stations

05485500 Des Moines River blw Raccoon River at Des Moines, IA 308
05485640 Fourmile Creek at Des Moines, IA. 310
05486000 North River near Norwalk, IA 312
05486490 Middle River near Indianola, IA 314
05487470 South River near Ackworth, IA 316
05487500 Des Moines River near Runnells, IA 318
05487540 Walnut Creek near Prairie City, IA 320
05487550 Walnut Creek near Vandalia, IA 330
05487980 White Breast Creek near Dallas, IA 340
05488100 Lake Red Rock near Pella, IA 342
05488110 Des Moines River near Pella, IA 344
05488200 English Creek near Knoxville, IA 346
05488500 Des Moines River near Tracy, IA. 348
05489000 Cedar Creek near Bussey, IA 350
05489500 Des Moines River at Ottumwa, IA 352
05490500 Des Moines River at Keosauqua, IA 354
05494300 Fox River at Bloomfield, IA. 356

Crest Stage Gaging Stations

05485940 Cedar Creek Tributary No. 2 near Winterset, IA 461
05486230 Bush Branch Creek near Stanzel, IA 462
05487825 Little White Breast Creek Tributary near Chariton, IA 462
05489350 South Avery Creek near Blakesburg, IA 462
05489490 Bear Creek at Ottumwa, IA 462

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA

LOCATION.--Lat 41°34'40", long 93°36'19", in SW $^1/_4$ NE $^1/_4$ sec.10, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100008, on left bank 40 ft downstream from bridge on Southeast 6th Street at Des Moines, 0.5 mi downstream from Raccoon River and Scott Street Dam, and at mile 201.0.

DRAINAGE AREA.--9,879 mi^2.

PERIOD OF RECORD.--April 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1943 (P).

GAGE.--Water-stage recorder. Datum of gage is 762.52 ft above NGVD of 1929. Prior to Oct. 1, 1951, and Oct. 1, 1953 to Sept. 30, 1959, water-stage recorder upstream of Scott Street Dam, 0.8 mi upstream at datum 11.16 ft higher. Oct. 1, 1951 to Sept. 30, 1953, Oct. 1, 1959 to April 24, 1997 water-stage recorder .3 mi downstream at current datum, and Oct. 1, 1959 to Sept. 30, 1961, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Des Moines municipal water supply is taken from infiltration galleries on Raccoon River, 3.5 mi upstream from station. At times, water is pumped from Raccoon River into recharge basins or into Waterworks Reservoir, capacity 4,800 acre-ft. Effluent from sewage treatment plant enters the river 2.3 mi downstream from station. Net effect of diversions not known. Flow regulated by Saylorville Lake (station 05481630) 12.7 mi upstream, since Apr. 12, 1977. U.S. Army Corps of Engineers rain gage and satellite data collection platform, U.S. National Weather Service Limited Automatic Remote Collector (LARC), and U.S. Geological Survey data logger at station.

COOPERATION.--Average monthly pumpage from galleries provided by Des Moines Water Works.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 116,000 ft^3/s July 11,1993, gage height, 34.29; minimum daily discharge, 26 ft^3/s Jan. 16-29, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, that of June 26, 1947, site and datum then in use. Flood of May 31, 1903, reached a stage of 20.9 ft, from flood profile, at Scott Street site and datum, by office of Des Moines City Engineer.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	607	2,700	934	1,080	513	705	2,150	15,600	9,300	19,100	3,560	486
2	1,320	2,610	1,180	1,090	543	673	2,390	13,100	8,940	18,200	3,310	412
3	652	2,620	1,680	1,000	601	656	2,360	13,500	8,780	17,000	2,920	399
4	1,610	2,550	2,080	918	595	673	2,270	17,000	8,150	15,000	2,680	380
5	3,380	2,350	2,070	1,050	590	692	2,240	23,500	7,520	13,900	2,490	371
6	7,590	2,210	1,950	1,040	590	625	2,270	24,400	7,330	14,100	2,420	364
7	9,240	2,190	1,670	999	597	617	2,330	25,500	7,260	16,900	2,350	358
8	8,100	2,300	1,200	1,050	578	631	2,370	25,600	8,000	e19,000	2,210	349
9	6,450	2,470	1,120	1,050	592	632	2,500	28,400	8,810	20,000	2,050	354
10	5,440	2,430	1,220	877	573	623	2,530	26,400	10,800	23,500	1,910	358
11	4,780	2,570	1,340	672	557	650	2,610	23,900	12,100	26,500	2,110	391
12	4,390	2,480	1,390	559	539	807	3,030	23,900	11,900	26,900	1,490	548
13	4,180	2,130	1,360	610	517	1,120	3,850	21,800	11,100	27,700	1,400	428
14	3,820	1,960	1,290	651	553	1,550	4,570	21,600	10,200	27,000	1,680	415
15	3,510	2,000	1,320	646	550	1,940	4,990	22,100	9,360	25,600	1,580	393
16	3,260	1,970	1,390	621	490	e2,210	4,980	20,300	8,520	21,900	1,410	383
17	3,210	1,960	1,430	584	510	e2,580	4,910	18,200	7,810	18,600	1,300	373
18	3,170	1,890	1,410	589	523	e2,920	4,720	16,600	7,050	16,900	1,220	384
19	3,240	1,780	1,400	590	544	3,470	4,500	15,100	6,300	15,500	1,130	409
20	3,070	1,760	1,320	551	581	3,410	4,530	13,900	6,370	14,100	1,070	363
21	2,920	1,750	1,240	522	668	2,710	5,090	12,500	6,310	12,900	1,000	462
22	2,650	1,740	1,170	492	810	2,300	5,880	11,200	6,180	11,300	919	441
23	2,450	1,720	1,070	501	735	2,090	6,170	10,500	5,980	10,400	832	395
24	2,400	1,700	944	e587	633	2,000	6,520	10,200	5,540	9,490	762	382
25	2,410	1,680	709	e654	572	1,920	6,560	9,880	5,610	8,470	735	355
26	2,270	1,630	595	e597	576	1,890	6,670	9,780	6,840	7,380	698	331
27	2,240	1,480	625	e611	819	1,870	6,470	9,860	10,300	6,250	665	356
28	2,530	1,220	769	530	881	1,850	6,310	9,930	15,700	5,490	615	343
29	1,670	1,260	817	474	---	1,860	6,070	9,820	19,000	4,870	598	328
30	1,380	1,040	970	474	---	1,850	10,700	9,710	19,900	3,840	547	323
31	2,690	---	1,130	471	---	1,920	---	9,560	---	3,580	538	---
TOTAL	106,629	60,150	38,793	22,140	16,830	49,444	132,540	523,340	276,960	481,370	48,199	11,634
MEAN	3,440	2,005	1,251	714	601	1,595	4,418	16,880	9,232	15,530	1,555	388
MAX	9,240	2,700	2,080	1,090	881	3,470	10,700	28,400	19,900	27,700	3,560	548
MIN	607	1,040	595	471	490	617	2,150	9,560	5,540	3,580	538	323
AC-FT	211,500	119,300	76,950	43,910	33,380	98,070	262,900	1,038,000	549,400	954,800	95,600	23,080
CFSM	0.35	0.20	0.13	0.07	0.06	0.16	0.45	1.71	0.93	1.57	0.16	0.04
IN.	0.40	0.23	0.15	0.08	0.06	0.19	0.50	1.97	1.04	1.81	0.18	0.04

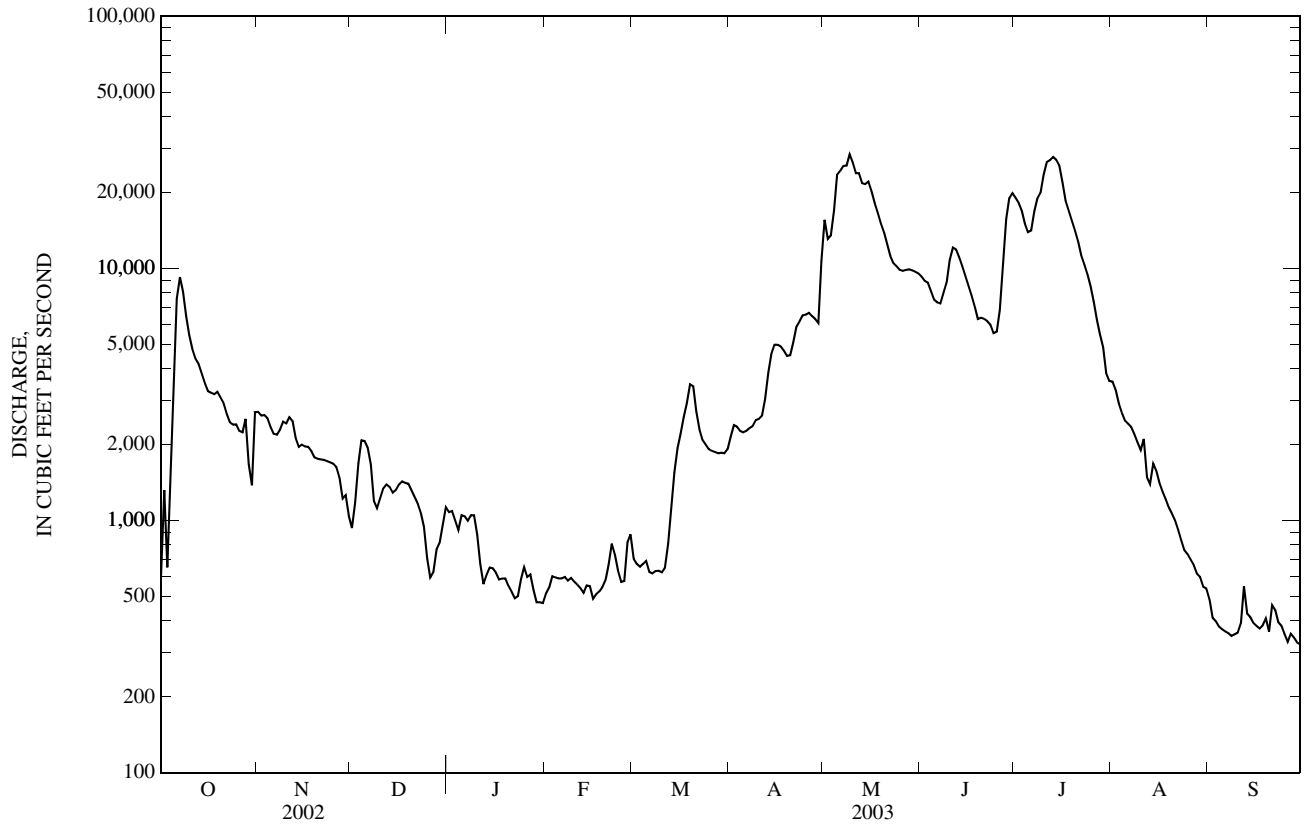
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	2,963	3,278	2,825	1,716	2,993	7,744	11,460	12,000	12,750	10,870	4,966	3,236
MAX	15,060	10,610	9,045	6,439	12,400	23,530	27,620	28,190	35,250	55,960	26,050	21,430
(WY)	(1987)	(1993)	(1983)	(1983)	(1984)	(1983)	(1993)	(1993)	(1984)	(1993)	(1993)	(1993)
MIN	293	363	342	310	343	560	627	1,159	1,716	739	441	388
(WY)	(2001)	(1990)	(1990)	(1981)	(1978)	(1981)	(2000)	(2000)	(1988)	(1988)	(1988)	(2003)

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1978 - 2003a	
ANNUAL TOTAL	1,032,246		1,768,029			
ANNUAL MEAN	2,828		4,844		6,412	
HIGHEST ANNUAL MEAN					19,180	1993
LOWEST ANNUAL MEAN					1,036	1989
HIGHEST DAILY MEAN	14,200	May 15	28,400	May 9	113,000	Jul 11, 1993
LOWEST DAILY MEAN	482	Sep 25	323	Sep 30	200	Mar 12, 1978b
ANNUAL SEVEN-DAY MINIMUM	517	Sep 23	345	Sep 24	236	Mar 7, 1978
MAXIMUM PEAK FLOW			29,200	May 9	116,000	Jul 11, 1993
MAXIMUM PEAK STAGE			24.40	May 9	34.29	Jul 11, 1993
INSTANTANEOUS LOW FLOW					200	Mar 12, 1978
ANNUAL RUNOFF (AC-FT)	2,047,000		3,507,000		4,645,000	
ANNUAL RUNOFF (CFSM)	0.29		0.49		0.65	
ANNUAL RUNOFF (INCHES)	3.89		6.66		8.82	
10 PERCENT EXCEEDS	6,460		15,000		18,100	
50 PERCENT EXCEEDS	1,850		1,970		3,150	
90 PERCENT EXCEEDS	771		512		540	

a Post regulation.
b Also Mar. 13, 1978.
e Estimated.



05485640 FOURMILE CREEK AT DES MOINES, IA

LOCATION.--Lat 41°36'50", long 93°32'43", in NE¼ NE¼ sec.32, T.79 N., R.23 W., Polk County, Hydrologic Unit 07100008, on right bank 20 ft downstream from bridge on Easton Blvd., 4.4 mi downstream from Muchikinock Creek, and 5.0 mi upstream from Des Moines River.

DRAINAGE AREA.--92.7 mi^2.

PERIOD OF RECORD.--October 1971 to current year.

REVISED RECORDS.--WDR IA-75-1: 1974 (P).

GAGE.--Water-stage recorder. Datum of gage is 795.87 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	7.0	e3.3	e3.8	e17	e14	5.3	775	35	e50	e6.1	e4.3
2	73	6.9	e4.2	e2.5	e19	e6.5	5.4	317	43	47	e6.0	e3.3
3	17	7.3	e3.4	e1.8	e15	e8.0	6.0	208	55	38	e5.5	2.7
4	18	7.2	e4.9	e6.5	e7.3	e7.0	7.6	933	42	34	e5.5	2.4
5	12	7.5	e4.4	e9.5	e6.0	e5.6	6.5	990	40	75	5.3	2.8
6	9.3	8.0	e3.1	e8.4	e2.6	e17	6.3	459	69	77	5.2	2.4
7	8.1	6.9	e7.5	e11	e1.1	e23	9.6	497	66	98	5.2	2.7
8	7.6	6.5	e5.7	e6.8	e5.7	e19	11	422	86	174	4.7	2.2
9	7.2	6.9	e4.1	e2.5	e4.8	e17	9.7	1,220	85	302	5.3	2.5
10	7.5	6.1	e8.6	e1.8	e11	e25	9.0	500	123	308	5.0	2.2
11	7.3	5.9	11	e1.3	e9.0	e40	8.3	317	83	158	6.6	10
12	6.7	5.8	e9.1	e1.8	e7.6	e52	8.2	219	74	97	6.1	17
13	7.2	5.6	e8.7	e2.9	e12	e55	8.4	183	63	70	4.8	6.0
14	6.9	5.6	e10	e2.5	e19	e65	9.0	328	52	57	5.2	5.7
15	6.0	5.6	e7.2	e2.0	e12	e81	8.9	232	46	48	5.1	4.2
16	5.6	5.2	e4.7	e3.9	e8.4	53	9.7	171	41	37	4.9	3.6
17	6.3	5.4	4.6	e1.0	e5.3	26	8.6	131	36	32	4.5	3.3
18	6.1	5.3	4.8	e3.9	e16	16	7.6	109	35	28	4.7	4.3
19	e5.6	5.2	4.6	e2.5	e14	15	23	96	53	25	4.7	8.6
20	e5.4	4.9	4.6	e8.8	e25	15	32	84	44	23	4.3	5.1
21	e5.2	5.1	e2.9	e6.2	e23	11	15	74	36	21	4.0	15
22	e5.0	5.0	e4.6	e3.3	e19	9.8	11	69	31	17	5.3	17
23	e6.0	4.7	e7.5	e2.4	e13	9.0	10	66	29	15	4.4	7.6
24	9.1	e3.8	e4.5	e7.5	e8.8	9.0	24	62	24	13	4.7	6.5
25	22	e2.7	e2.1	e10	e4.2	8.5	19	57	52	11	4.1	5.9
26	11	e4.7	e2.2	e4.7	e7.4	8.2	13	52	58	9.4	3.9	5.6
27	8.3	e2.3	e9.1	e8.5	e12	9.6	11	49	31	9.7	3.5	5.0
28	12	e3.6	e5.8	e14	e13	9.6	22	49	139	15	4.5	4.5
29	9.2	4.9	e4.9	e8.2	---	8.8	16	44	117	9.7	e4.6	4.2
30	7.7	e3.1	e1.2	e14	---	8.7	986	43	e75	11	e3.8	3.4
31	7.3	---	e2.6	e19	---	8.1	---	38	---	8.6	e4.1	---
TOTAL	341.6	164.7	165.9	183.0	318.2	660.4	1,327.1	8,794	1,763	1,918.4	151.6	170.0
MEAN	11.0	5.49	5.35	5.90	11.4	21.3	44.2	284	58.8	61.9	4.89	5.67
MAX	73	8.0	11	19	25	81	986	1,220	139	308	6.6	17
MIN	5.0	2.3	1.2	1.0	1.1	5.6	5.3	38	24	8.6	3.5	2.2
AC-FT	678	327	329	363	631	1,310	2,630	17,440	3,500	3,810	301	337
CFSM	0.12	0.06	0.06	0.06	0.12	0.23	0.48	3.06	0.63	0.67	0.05	0.06
IN.	0.14	0.07	0.07	0.07	0.13	0.27	0.53	3.53	0.71	0.77	0.06	0.07

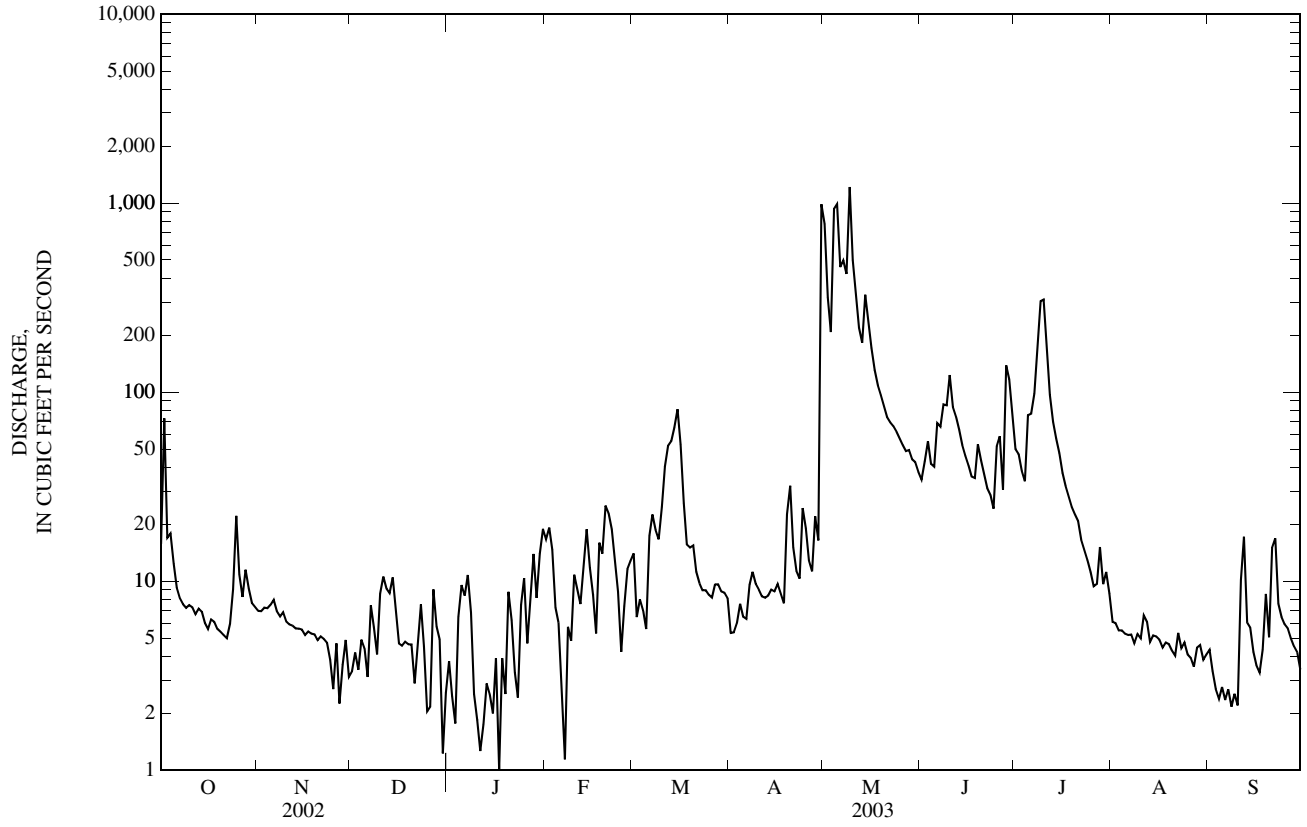
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2003, BY WATER YEAR (WY)

MEAN	37.6	42.1	32.3	22.5	46.3	95.9	118	146	155	97.3	45.7	34.2
MAX	258	317	124	118	206	292	354	462	505	607	363	270
(WY)	(1987)	(1984)	(1983)	(1974)	(1973)	(1979)	(1973)	(1974)	(1998)	(1993)	(1993)	(1993)
MIN	1.36	1.57	0.25	0.001	0.55	4.04	3.67	6.67	0.73	0.074	1.66	1.37
(WY)	(1989)	(1977)	(1977)	(1977)	(1977)	(1981)	(1981)	(1977)	(1977)	(1977)	(1988)	(1988)

05485640 FOURMILE CREEK AT DES MOINES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1972 - 2003	
ANNUAL TOTAL	7,587.8		15,957.9			
ANNUAL MEAN	20.8		43.7		72.7	
HIGHEST ANNUAL MEAN					204	1993
LOWEST ANNUAL MEAN					7.97	1981
HIGHEST DAILY MEAN	313	Jun 13	1,220	May 9	3,570	Jun 9, 1974
LOWEST DAILY MEAN	1.2	Dec 30	1.0	Jan 17a	0.00	Jan 2, 1977
ANNUAL SEVEN-DAY MINIMUM	3.5	Nov 25	2.1	Jan 9	0.00	Jan 2, 1977
MAXIMUM PEAK FLOW			1,980	May 4	5,600	Jun 18, 1998
MAXIMUM PEAK STAGE			11.41	May 4	15.00	Jun 18, 1998
INSTANTANEOUS LOW FLOW			1.6	Sep 11	0.00	Jan 2, 1977
ANNUAL RUNOFF (AC-FT)	15,050		31,650		52,700	
ANNUAL RUNOFF (CFSM)	0.22		0.47		0.78	
ANNUAL RUNOFF (INCHES)	3.04		6.40		10.66	
10 PERCENT EXCEEDS	46		75		171	
50 PERCENT EXCEEDS	9.1		8.5		25	
90 PERCENT EXCEEDS	4.3		3.4		3.1	

a Ice affected.
e Estimated.



05486000 NORTH RIVER NEAR NORWALK, IA

LOCATION.--Lat 41°27'25", long 93°39'10", in NW¼ SW¼ sec.20, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on county highway R57, 1.7 mi southeast of Norwalk, 5.2 mi upstream from Middle Creek, and 6.2 mi downstream from Badger Creek.

DRAINAGE AREA.--349 mi^2.

PERIOD OF RECORD.--February 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1946. WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 788.45 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 12, 1946, nonrecording gage at same site and datum. Jan. 7 to Oct. 11, 1960, nonrecording gage at site 2.1 mi upstream at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	6.7	e2.4	4.3	e2.5	63	7.9	909	97	95	8.2	2.8
2	30	6.2	e2.5	e4.0	e2.9	37	7.3	747	84	82	7.5	2.7
3	26	6.0	e2.4	e3.9	e2.9	22	6.8	406	86	76	7.3	2.5
4	42	5.3	e2.6	e3.7	e2.2	12	6.8	718	97	70	7.2	2.2
5	11	5.3	e2.5	e3.7	e2.3	8.9	7.1	1,720	97	87	7.0	1.9
6	9.1	5.4	e2.6	e3.9	e2.1	8.3	7.2	1,750	99	e98	6.7	1.8
7	28	5.5	e2.6	e4.0	e1.4	7.9	8.2	994	118	e120	6.3	1.6
8	25	5.5	e2.6	e3.4	e1.6	7.6	9.2	737	128	83	6.1	1.4
9	8.3	5.3	e2.5	e3.0	e1.6	7.7	14	984	125	80	6.2	1.3
10	6.3	5.3	e2.6	e3.1	e1.6	7.7	17	1,510	211	82	5.9	1.2
11	5.0	5.1	e2.8	e2.8	e1.7	30	22	1,040	556	115	6.0	1.1
12	3.8	4.8	e3.2	e3.0	e1.7	e42	41	548	400	111	5.8	1.8
13	3.4	4.4	3.6	e2.9	e1.7	e52	75	426	283	68	5.7	2.0
14	3.4	4.1	3.8	e2.6	e2.3	e61	58	416	e233	53	5.4	2.1
15	3.0	4.2	3.9	e2.3	e2.1	e84	41	446	e209	46	5.3	2.1
16	3.6	4.2	4.0	e2.4	e2.2	e189	31	403	e184	37	e4.8	2.0
17	4.9	4.1	4.4	e2.3	e1.9	313	23	352	e180	31	e4.5	2.0
18	5.7	3.1	4.7	e2.4	e2.6	176	16	310	e180	25	e4.3	2.1
19	6.0	3.1	5.3	e2.2	e2.6	100	23	280	e168	19	4.1	2.4
20	5.8	2.8	5.4	e2.3	e1.1	76	52	258	154	16	4.0	2.0
21	5.7	2.5	5.1	e2.1	e14	62	86	237	130	14	3.9	2.2
22	5.7	2.4	4.9	e2.1	e213	52	92	214	113	11	3.7	2.2
23	5.5	2.3	e5.1	e1.9	e145	47	80	202	105	9.8	3.6	1.7
24	5.8	e2.3	e4.9	e1.6	e88	35	72	188	96	8.9	3.6	1.4
25	6.8	e2.2	e4.4	e1.7	e67	26	89	176	160	8.4	3.5	2.0
26	6.4	e2.3	e3.9	e1.5	e72	17	96	169	376	8.3	3.6	2.2
27	6.4	e2.3	e3.8	e1.7	e81	13	95	154	260	e8.1	3.7	1.7
28	7.3	e2.2	e3.8	e1.7	89	9.4	77	137	179	e7.7	3.6	1.4
29	7.1	2.3	e3.9	e1.7	---	8.6	65	124	138	8.2	3.5	1.2
30	7.7	e2.3	e4.3	e1.8	---	8.5	131	116	115	8.0	3.1	1.0
31	7.3	---	4.4	e2.3	---	8.2	---	105	---	7.8	2.9	---
TOTAL	314.0	119.5	114.9	82.3	810.0	1,591.8	1,356.5	16,776	5,361	1,494.2	157.0	56.0
MEAN	10.1	3.98	3.71	2.65	28.9	51.3	45.2	541	179	48.2	5.06	1.87
MAX	42	6.7	5.4	4.3	213	313	131	1,750	556	120	8.2	2.8
MIN	3.0	2.2	2.4	1.5	1.1	7.6	6.8	105	84	7.7	2.9	1.0
AC-FT	623	237	228	163	1,610	3,160	2,690	33,280	10,630	2,960	311	111
CFSM	0.03	0.01	0.01	0.01	0.08	0.15	0.13	1.55	0.51	0.14	0.01	0.01
IN.	0.03	0.01	0.01	0.01	0.09	0.17	0.14	1.79	0.57	0.16	0.02	0.01

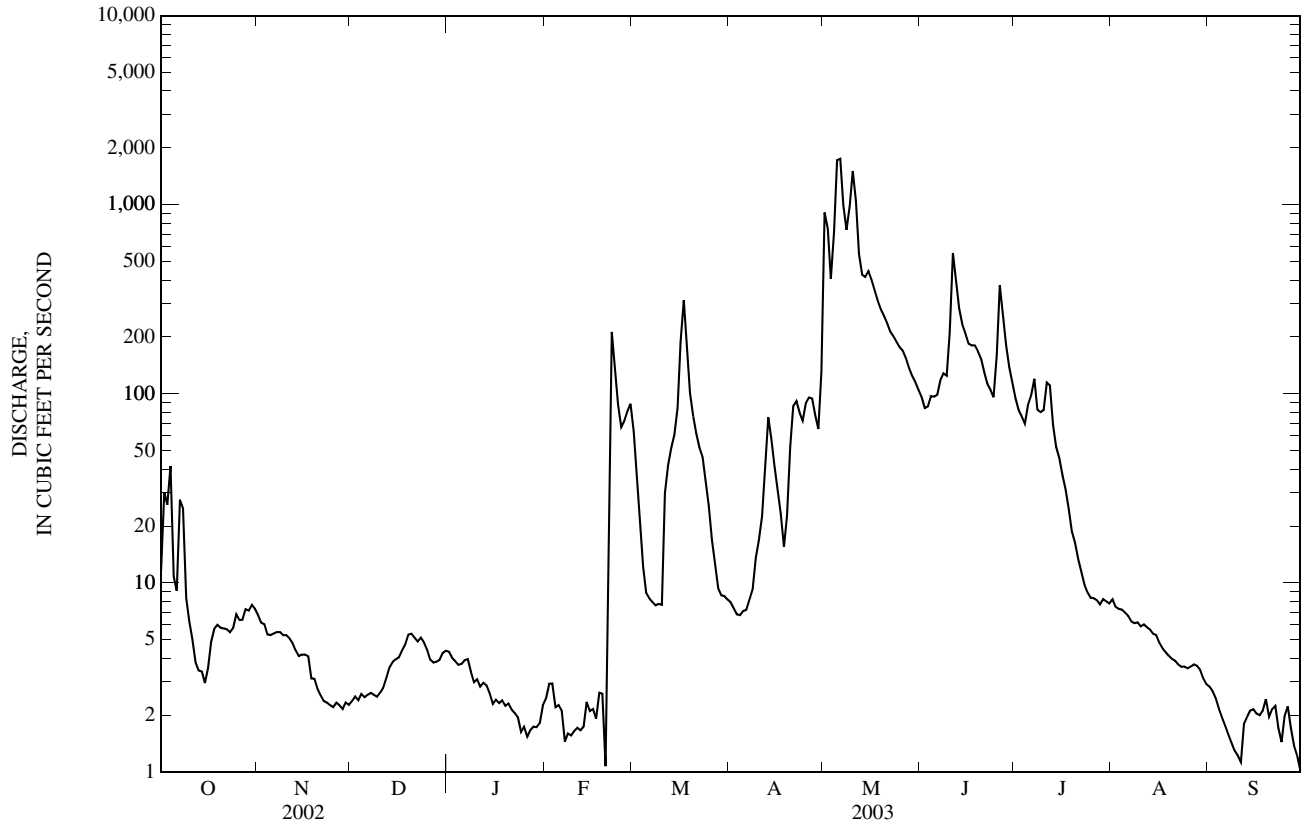
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	74.7	97.6	72.0	74.7	155	327	341	358	374	189	107	88.2
MAX	593	747	567	739	911	1,041	1,401	1,699	3,260	1,722	1,185	1,007
(WY)	(1987)	(1973)	(1993)	(1973)	(1973)	(1965)	(1973)	(1996)	(1947)	(1993)	(1993)	(1993)
MIN	0.20	0.37	0.36	0.38	3.21	3.90	1.22	3.71	1.58	1.10	0.21	0.26
(WY)	(1950)	(1956)	(1956)	(1954)	(1956)	(1954)	(1956)	(1967)	(1977)	(1977)	(1968)	(1957)

05486000 NORTH RIVER NEAR NORWALK, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	11,382.5		28,233.2			
ANNUAL MEAN	31.2		77.4		188	
HIGHEST ANNUAL MEAN					709	1993
LOWEST ANNUAL MEAN					8.08	1968
HIGHEST DAILY MEAN	580	May 13	1,750	May 6	21,600	Jun 13, 1947
LOWEST DAILY MEAN	2.2	Nov 25	1.0	Sep 30	0.00	Jul 20, 1954a
ANNUAL SEVEN-DAY MINIMUM	2.3	Nov 23	1.5	Sep 6	0.00	Jul 25, 1954
MAXIMUM PEAK FLOW			1,800	May 6	32,000	Jun 13, 1947b
MAXIMUM PEAK STAGE			17.04	May 6	25.30	Jun 13, 1947c
INSTANTANEOUS LOW FLOW			0.95	Sep 30	0.00	Jul 20, 1954
ANNUAL RUNOFF (AC-FT)	22,580		56,000		136,200	
ANNUAL RUNOFF (CFSM)	0.089		0.22		0.54	
ANNUAL RUNOFF (INCHES)	1.21		3.01		7.32	
10 PERCENT EXCEEDS	88		182		430	
50 PERCENT EXCEEDS	9.2		6.4		42	
90 PERCENT EXCEEDS	3.9		2.1		2.5	

a Many days 1954-58, Oct. 7-9, 2001.
b From rating curve extended above 9,000 ft^3/s on basis of velocity-area studies.
c From floodmark.
e Estimated.



05486490 MIDDLE RIVER NEAR INDIANOLA, IA

LOCATION.--Lat 41°25'27", long 93°35'09", in SW¼ SE¼ sec.35, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on right bank 10 ft downstream from bridge on county highway, 0.4 mi upstream from Cavitt Creek, 1.5 mi upstream from bridge on U.S. Highway 69, and 4.6 mi northwest of Indianola.

DRAINAGE AREA.--503 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1941, 1944, 1946, 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 776.15 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark). Prior to June 11, 1946, June 9, 1947 to Nov. 23, 1948, and Sept. 8, 1951 to Oct. 30, 1952, nonrecording gage; and June 11, 1946 to June 8, 1947 (destroyed by flood), Nov. 24, 1948 to Sept. 7, 1951, Oct. 31, 1952 to Sept. 30, 1962, water-stage recorder at site 1.6 mi downstream at datum 2.81 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	14	e11	17	e17	e51	30	788	87	123	24	9.9
2	70	13	e11	e16	e19	e33	28	824	86	105	24	8.8
3	42	13	e10	e15	e15	e39	27	480	88	92	23	8.4
4	45	13	e11	e16	e9.2	e24	28	1,080	89	81	22	7.7
5	35	13	e9.7	e17	e7.1	e15	30	2,950	91	78	22	7.4
6	38	12	e9.3	e16	e4.7	e27	30	1,620	101	82	21	7.1
7	40	11	e11	e16	e2.8	e33	36	1,110	107	76	21	7.1
8	50	11	e9.8	e16	e7.0	e29	40	990	123	82	20	6.7
9	36	10	e11	e15	e5.8	e24	40	1,810	104	123	19	6.5
10	28	10	e13	e13	e11	e30	43	2,190	412	104	18	6.4
11	23	9.7	e15	e12	e8.6	e45	52	1,030	518	75	18	7.2
12	19	10	e15	e12	e6.8	e55	57	679	388	75	17	10
13	17	9.8	e14	e11	e10	e64	60	540	219	69	16	9.8
14	16	9.4	e13	e11	e21	e69	64	492	163	57	17	9.8
15	14	9.4	e13	e8.8	e14	e81	57	556	135	51	22	8.1
16	14	9.1	e13	e7.1	e9.3	e125	53	533	114	47	19	7.2
17	14	8.7	e13	e6.1	e6.0	e196	51	423	110	44	17	6.7
18	13	8.8	15	e6.5	e32	142	48	345	108	41	15	7.8
19	13	9.0	12	e5.3	e28	91	56	287	93	39	14	7.9
20	12	9.0	12	e5.7	e52	76	118	251	85	38	13	6.8
21	13	9.1	11	e4.3	e238	69	137	224	86	36	12	8.0
22	11	8.8	12	e2.8	e165	59	106	199	78	35	12	9.1
23	11	9.3	e13	e2.2	e51	49	90	178	70	33	11	7.2
24	12	8.9	e13	e1.4	e38	43	98	166	65	32	11	6.6
25	16	8.3	e14	e4.0	e29	38	138	158	637	30	10	6.0
26	17	9.1	e14	e3.6	e34	35	132	146	2,560	28	10	5.6
27	15	e8.7	e17	e4.6	e41	34	103	133	574	30	9.8	5.4
28	16	e9.2	e17	e6.1	e47	33	89	119	323	32	9.6	5.1
29	15	9.5	e17	e4.3	---	32	80	108	205	29	9.6	5.0
30	15	e9.9	e17	e7.3	---	31	120	100	152	26	8.7	5.1
31	15	---	16	e18	---	31	---	94	---	26	10	---
TOTAL	706	303.7	402.8	301.1	929.3	1,703	2,041	20,603	7,971	1,819	495.7	220.4
MEAN	22.8	10.1	13.0	9.71	33.2	54.9	68.0	665	266	58.7	16.0	7.35
MAX	70	14	17	18	238	196	138	2,950	2,560	123	24	10
MIN	11	8.3	9.3	1.4	2.8	15	27	94	65	26	8.7	5.0
AC-FT	1,400	602	799	597	1,840	3,380	4,050	40,870	15,810	3,610	983	437
CFSM	0.05	0.02	0.03	0.02	0.07	0.11	0.14	1.32	0.53	0.12	0.03	0.01
IN.	0.05	0.02	0.03	0.02	0.07	0.13	0.15	1.52	0.59	0.13	0.04	0.02

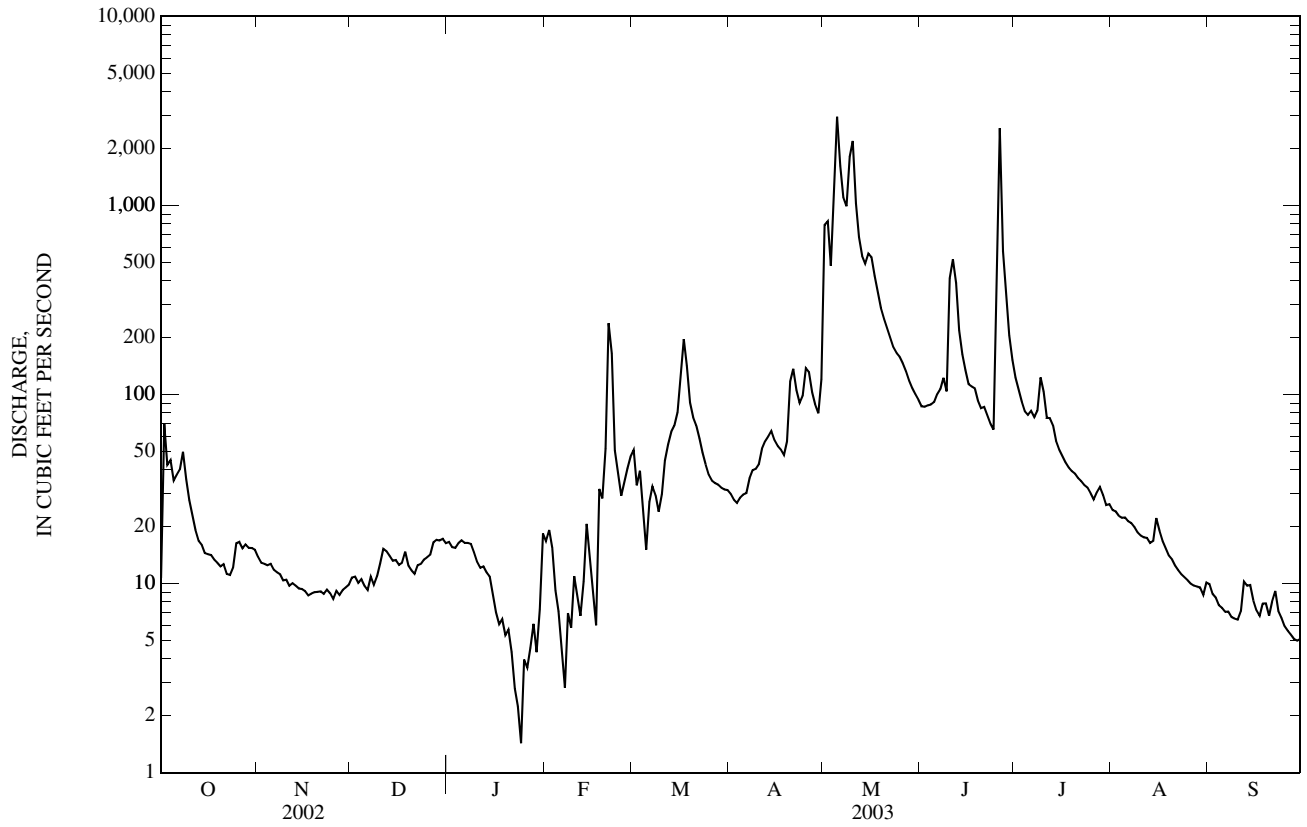
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	109	129	111	101	222	458	480	513	502	267	161	167
MAX	928	961	1,070	646	1,415	1,417	1,983	2,053	4,094	3,121	1,419	1,460
(WY)	(1974)	(1973)	(1983)	(1973)	(1973)	(1962)	(1973)	(1996)	(1947)	(1993)	(1993)	(1992)
MIN	4.28	2.80	1.62	1.02	4.68	7.35	4.81	10.1	3.81	5.20	4.47	3.92
(WY)	(1969)	(1956)	(1956)	(1977)	(1977)	(1954)	(1956)	(1956)	(1977)	(1977)	(1968)	(1968)

05486490 MIDDLE RIVER NEAR INDIANOLA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	14,415.9		37,496.0			
ANNUAL MEAN	39.5		103		268	
HIGHEST ANNUAL MEAN					1,006	1993
LOWEST ANNUAL MEAN					17.8	1968
HIGHEST DAILY MEAN	1,030	May 12	2,950	May 5	21,400	Jun 13, 1947
LOWEST DAILY MEAN	7.8	Jan 15	1.4	Jan 24a	0.11	Jul 2, 1977
ANNUAL SEVEN-DAY MINIMUM	8.9	Nov 21	3.3	Jan 21	0.51	Jun 29, 1977
MAXIMUM PEAK FLOW			4,170	Jun 26	34,000	Jun 13, 1947
MAXIMUM PEAK STAGE			15.21	Jun 26	28.27	Jun 13, 1947b
INSTANTANEOUS LOW FLOW					0.11	Jul 2, 1977
ANNUAL RUNOFF (AC-FT)	28,590		74,370		194,300	
ANNUAL RUNOFF (CFSM)	0.079		0.20		0.53	
ANNUAL RUNOFF (INCHES)	1.07		2.77		7.24	
10 PERCENT EXCEEDS	66		164		598	
50 PERCENT EXCEEDS	20		20		67	
90 PERCENT EXCEEDS	10		7.2		8.9	

a Ice affected.
b From floodmark.
e Estimated.



05487470 SOUTH RIVER NEAR ACKWORTH, IA

LOCATION.--Lat 41°20'14", long 93°29'10", in SE¼ SE¼ sec.34, T.76 N., R.23 W., Warren County, Hydrologic Unit 07100008, on right bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Otter Creek, and 2.2 mi southwest of Ackworth.

DRAINAGE AREA.--460 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1941, 1945 (M), 1946.

GAGE.--Water-stage recorder. Datum of gage is 769.97 ft above NGVD of 1929. Prior to June 12, 1946, nonrecording gage, June 13, 1946 to Apr. 13, 1960, water-stage recorder, and Apr. 14, 1960 to Sept. 30, 1961, nonrecording gage, all at site 4.0 mi downstream at datum 8.06 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 24.5 ft, from information by local residents, discharge, about 30,000 ft^3/s, at site 4.0 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	4.1	e4.7	5.4	e15	e35	11	100	14	84	5.3	4.7
2	65	4.2	e4.5	e4.6	e17	e14	10	76	17	66	5.1	4.4
3	50	4.2	e3.5	e4.4	e14	e20	10	57	25	52	5.2	4.0
4	26	4.4	e3.8	e4.7	e7.0	e10	12	1,070	23	41	5.0	3.9
5	9.7	4.9	e3.5	e4.6	e5.8	e6.1	13	2,270	20	41	5.6	3.8
6	5.2	4.9	e3.7	e4.4	e3.6	e13	13	470	55	35	5.1	3.7
7	4.2	4.8	e4.3	e4.6	e2.0	e19	25	439	102	66	4.8	4.1
8	4.0	4.6	e3.8	e5.3	e6.3	e17	30	389	92	43	4.8	3.7
9	3.6	4.6	e3.6	e5.0	e5.8	e14	30	2,710	74	57	4.9	3.5
10	3.4	4.4	e4.7	e4.1	e11	e21	31	785	555	57	4.9	3.6
11	3.4	4.2	e5.3	e3.1	e8.3	e34	31	565	374	28	5.3	5.3
12	3.4	4.0	e5.2	e3.2	e5.4	e45	26	232	137	21	5.8	16
13	3.3	4.2	6.0	e2.5	e9.7	e55	22	172	88	16	5.6	8.4
14	3.4	4.3	6.5	e2.0	e20	e60	17	151	65	13	5.6	7.1
15	3.4	4.1	5.6	e1.5	e11	e71	13	149	50	11	5.4	5.2
16	3.5	4.2	5.7	e1.8	e6.4	e113	12	115	41	8.9	5.3	4.6
17	3.8	4.2	6.1	e1.3	e4.0	e169	14	92	38	8.3	5.2	4.8
18	3.9	4.4	9.9	e2.0	e27	72	14	77	33	7.9	5.2	4.4
19	3.7	4.8	8.4	e1.7	e24	59	28	69	30	7.5	4.7	6.0
20	3.5	4.5	6.1	e2.6	e41	62	112	68	30	7.3	4.5	4.5
21	3.6	4.4	6.7	e2.0	e175	55	143	61	24	6.8	4.2	8.3
22	3.7	4.2	5.6	e1.5	e105	43	84	53	22	6.0	4.0	7.8
23	3.5	4.2	e5.1	e1.0	e40	33	52	47	20	5.7	4.1	5.0
24	5.0	4.2	e4.7	e1.6	e26	27	66	43	17	5.7	4.0	5.6
25	14	e3.6	e4.5	e3.9	e15	21	146	43	1,780	5.5	3.9	4.2
26	10	e3.9	e4.4	e3.0	e20	18	117	38	3,820	5.2	4.0	3.9
27	5.8	e4.1	e4.9	e3.7	e24	18	68	31	558	9.9	3.8	3.9
28	6.3	4.3	e5.2	e4.7	e31	16	49	27	268	7.2	3.8	3.6
29	5.2	4.9	e5.8	e3.8	---	14	44	24	163	5.4	4.0	3.6
30	4.8	e4.1	e5.9	e6.0	---	12	73	20	112	5.3	4.3	3.6
31	4.4	---	5.3	e17	---	11	---	16	---	5.4	4.6	---
TOTAL	276.3	129.9	163.0	117.0	680.3	1,177.1	1,316	10,459	8,647	739.0	148.0	155.2
MEAN	8.91	4.33	5.26	3.77	24.3	38.0	43.9	337	288	23.8	4.77	5.17
MAX	65	4.9	9.9	17	175	169	146	2,710	3,820	84	5.8	16
MIN	3.3	3.6	3.5	1.0	2.0	6.1	10	16	14	5.2	3.8	3.5
AC-FT	548	258	323	232	1,350	2,330	2,610	20,750	17,150	1,470	294	308
CFSM	0.02	0.01	0.01	0.01	0.05	0.08	0.10	0.73	0.63	0.05	0.01	0.01
IN.	0.02	0.01	0.01	0.01	0.06	0.10	0.11	0.85	0.70	0.06	0.01	0.01

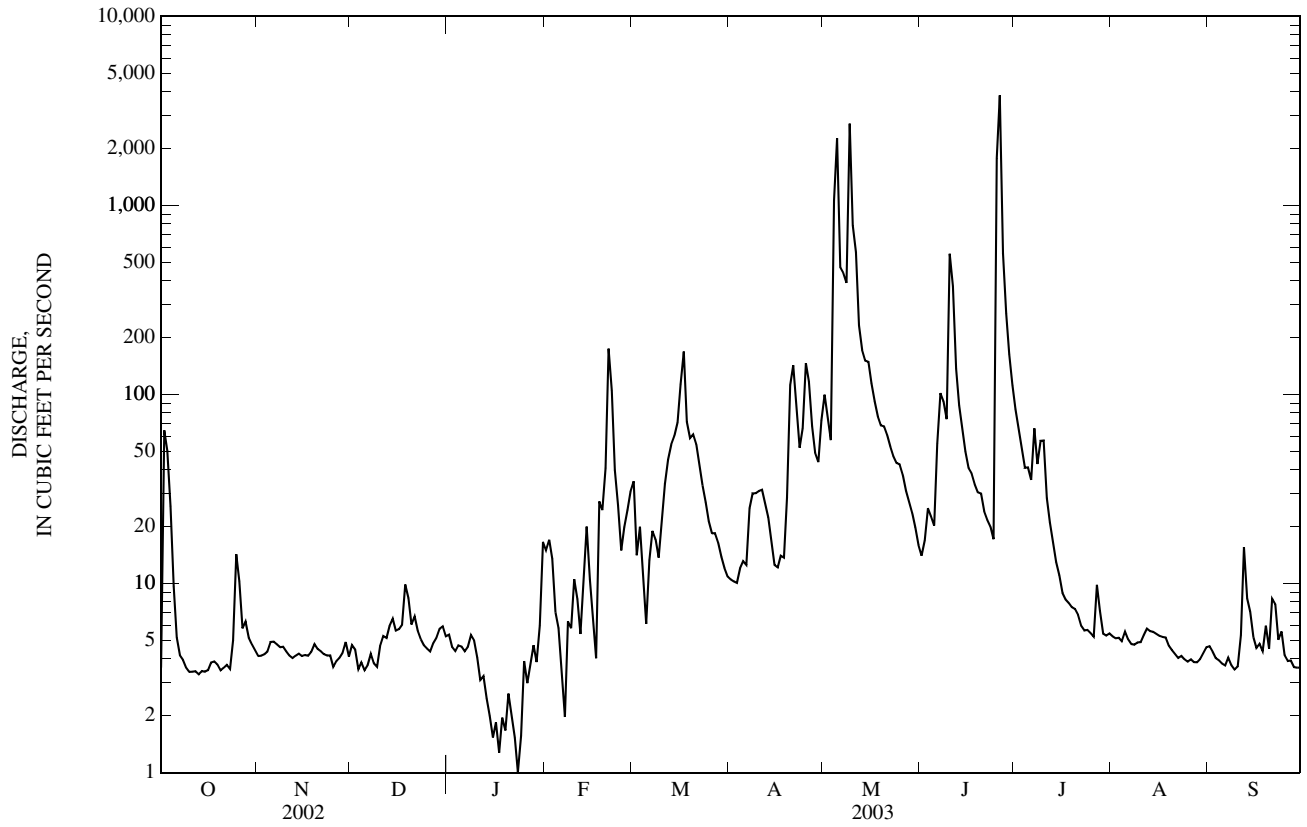
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	106	122	106	98.5	209	437	450	470	469	251	125	147
MAX	1,283	906	1,022	901	1,209	1,568	1,937	1,962	4,305	3,870	1,546	1,332
(WY)	(1974)	(1962)	(1983)	(1974)	(1973)	(1960)	(1973)	(1959)	(1947)	(1993)	(1993)	(1993)
MIN	0.35	1.05	0.88	1.05	3.70	3.61	1.70	6.88	1.79	1.48	2.02	1.05
(WY)	(1957)	(1957)	(1956)	(1956)	(1989)	(1957)	(1956)	(2000)	(1977)	(1977)	(1957)	(1957)

05487470 SOUTH RIVER NEAR ACKWORTH, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	17,336.1		24,007.8			
ANNUAL MEAN	47.5		65.8		249	
HIGHEST ANNUAL MEAN					966	1993
LOWEST ANNUAL MEAN					16.1	1989
HIGHEST DAILY MEAN	1,990	May 12	3,820	Jun 26	31,400	Jun 17, 1990
LOWEST DAILY MEAN	2.5	Sep 27	1.0	Jan 23a	0.00	Sep 19, 1956b
ANNUAL SEVEN-DAY MINIMUM	2.8	Sep 24	1.7	Jan 17	0.00	Sep 19, 1956
MAXIMUM PEAK FLOW			8,400	Jun 25	38,100	Jun 17, 1990
MAXIMUM PEAK STAGE			18.18	Jun 25	32.85	Jul 5, 1981
INSTANTANEOUS LOW FLOW					0.00	Sep 19, 1956b
ANNUAL RUNOFF (AC-FT)	34,390		47,620		180,300	
ANNUAL RUNOFF (CFSM)	0.10		0.14		0.54	
ANNUAL RUNOFF (INCHES)	1.40		1.94		7.35	
10 PERCENT EXCEEDS	86		84		472	
50 PERCENT EXCEEDS	13		6.3		39	
90 PERCENT EXCEEDS	3.6		3.6		3.3	

a Ice affected.
b Also Sept. 30 to Oct. 13, 1956.
e Estimated.



05487500 DES MOINES RIVER NEAR RUNNELLS, IA

LOCATION.--Lat 41°29'19", long 93°20'17", in SE¼ NW¼ sec.12, T.77 N., R.22 W., Polk County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on State Highway 316, 0.2 mi downstream from South River River, 0.5 mi upstream from Camp Creek, 2.2 mi southeast of Runnells, 37.2 mi upstream from Red Rock Dam, and at mi 179.5.

DRAINAGE AREA.--11,655 mi^2.

PERIOD OF RECORD.--October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good except those for estimated daily discharge, which are poor. Flow regulated by Saylorville Lake (station 05481630) 34.2 mi upstream. Stage-discharge relation is affected at times by backwater from Lake Red Rock (05488100). U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on May 31, 1903; June 14, 1947; June 26, 1947; and June 24, 1954. No gage height or discharge was determined. Gage height and discharge information is available for these floods at other sites on the Des Moines River.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e600	2,740	e1,100	1,160	e598	e911	e2,230	18,200	e9,610	e20,000	3,990	703
2	e740	2,750	e1,490	1,150	e634	e805	e2,420	17,100	e9,270	e19,200	3,810	598
3	1,890	2,810	e1,860	e1,070	e683	e826	e2,450	15,000	e9,050	e18,400	3,340	487
4	1,220	2,790	e2,140	e987	e691	e795	e2,430	17,000	e8,800	e17,200	2,960	448
5	2,150	2,580	e2,130	e1,080	e656	e775	e2,370	28,500	e8,190	e15,400	2,670	418
6	5,530	2,350	e2,060	1,060	e645	e783	e2,370	29,600	7,470	e14,600	2,550	393
7	8,860	2,320	e1,850	1,020	e659	e771	e2,390	28,400	7,540	15,400	2,510	362
8	e9,320	e2,410	e1,450	e1,080	e682	e811	e2,430	26,800	7,970	19,200	2,350	349
9	7,340	e2,590	e1,310	e1,080	e687	803	2,450	29,900	8,900	19,800	e2,240	321
10	6,210	e2,560	e1,420	916	e666	e815	2,550	29,200	11,400	22,100	e2,080	360
11	5,900	e2,670	e1,560	e770	e651	e942	2,590	e26,900	14,100	24,500	e1,940	390
12	5,140	e2,550	e1,630	e690	e610	e1,470	2,740	e25,500	14,200	26,400	e2,180	681
13	4,850	2,190	e1,580	e714	e605	e1,840	3,560	e25,000	13,000	27,300	e1,600	623
14	4,440	e2,050	e1,510	e737	e637	e2,710	4,590	e22,200	11,700	27,800	1,570	568
15	3,990	e2,070	e1,540	e726	e632	3,070	5,320	e22,400	10,600	26,800	1,670	604
16	3,720	e2,040	e1,610	e705	e585	e3,230	5,460	e22,600	9,460	24,800	1,570	620
17	3,570	e2,030	e1,710	e667	e581	e3,410	5,280	e20,600	8,810	20,600	1,450	805
18	3,560	e1,960	1,690	e673	e672	e3,410	5,160	18,300	7,840	18,200	1,420	515
19	3,520	e1,880	e1,670	e685	e702	3,750	4,810	17,000	e7,040	16,600	1,320	526
20	3,590	e1,840	e1,540	e654	e722	4,220	e5,250	16,400	e6,630	15,200	1,290	622
21	3,330	e1,820	e1,460	e622	e1,160	3,400	e5,760	16,200	e6,650	13,700	1,240	660
22	3,170	e1,800	e1,330	e584	e1,330	2,670	6,360	15,600	e6,480	12,100	1,180	788
23	2,840	e1,790	e1,240	e596	e1,130	e2,330	6,380	14,900	6,180	e11,100	1,130	751
24	2,800	e1,760	e1,130	e669	e946	e2,120	6,580	14,300	6,270	e10,300	1,010	586
25	2,820	e1,750	e954	e723	e763	e2,040	7,250	13,500	7,300	e9,530	974	578
26	2,720	e1,710	e781	e671	e811	e2,000	7,300	12,800	16,000	e8,720	e940	583
27	2,640	e1,590	e810	e686	e1,050	e1,970	7,220	12,200	11,000	e7,520	870	421
28	2,640	e1,380	e925	e614	e1,070	e1,960	6,800	11,500	14,000	6,360	854	442
29	e2,800	e1,440	e954	e558	---	e1,980	6,730	11,000	17,900	6,070	767	487
30	e2,110	e1,230	e1,090	e558	---	e1,950	8,950	10,300	19,400	4,810	752	481
31	e2,750	---	e1,210	e555	---	e2,060	---	9,770	---	4,130	737	---
TOTAL	116,760	63,450	44,734	24,460	21,258	60,627	138,180	598,670	302,760	503,840	54,964	16,170
MEAN	3,766	2,115	1,443	789	759	1,956	4,606	19,310	10,090	16,250	1,773	539
MAX	9,320	2,810	2,140	1,160	1,330	4,220	8,950	29,900	19,400	27,800	3,990	805
MIN	600	1,230	781	555	581	771	2,230	9,770	6,180	4,130	737	321
AC-FT	231,600	125,900	88,730	48,520	42,170	120,300	274,100	1,187,000	600,500	999,400	109,000	32,070
CFSM	0.32	0.18	0.12	0.07	0.07	0.17	0.40	1.66	0.87	1.39	0.15	0.05
IN.	0.37	0.20	0.14	0.08	0.07	0.19	0.44	1.91	0.97	1.61	0.18	0.05

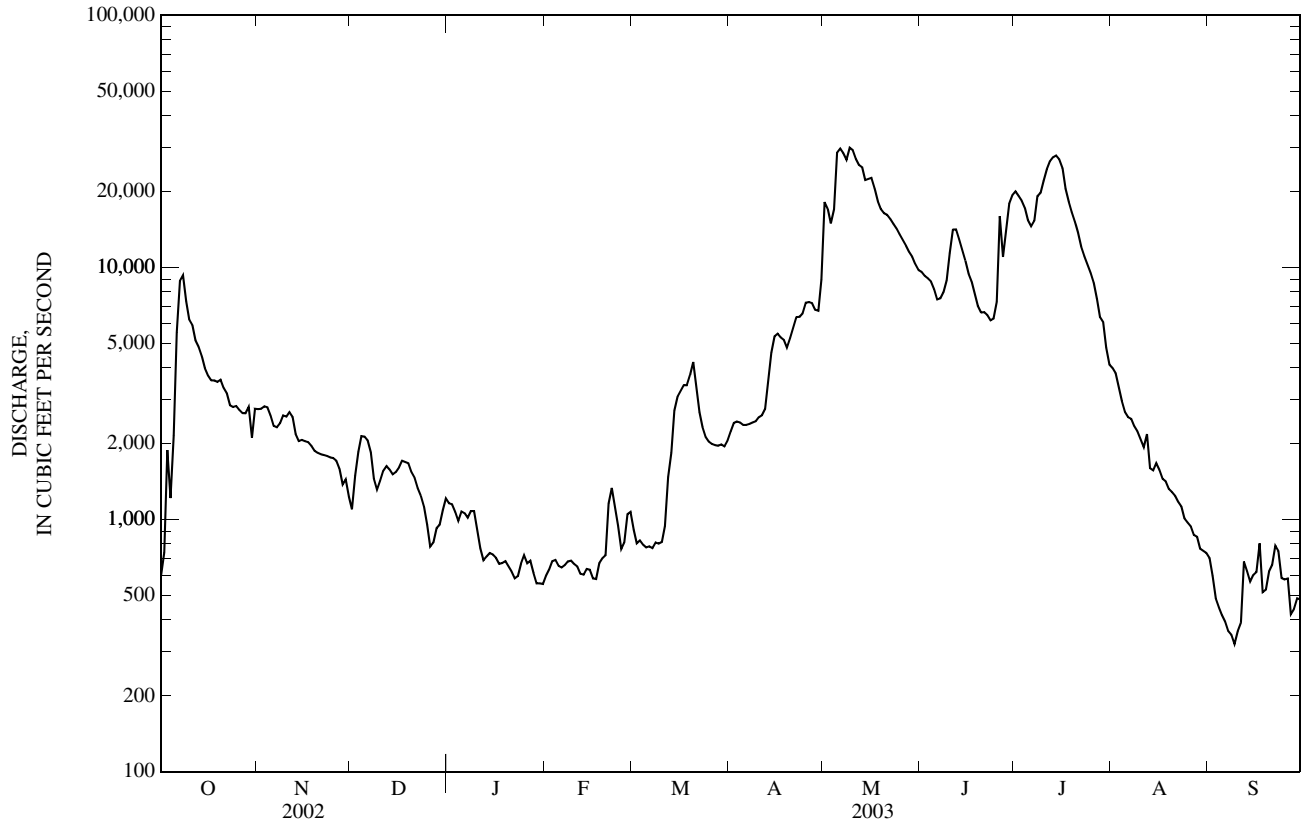
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 2003, BY WATER YEAR (WY)

MEAN	3,462	3,604	3,300	1,868	3,148	8,663	12,890	15,020	15,610	13,750	6,355	3,644
MAX	18,040	12,660	10,000	6,237	8,557	18,390	30,380	32,740	40,530	68,140	32,990	26,320
(WY)	(1987)	(1993)	(1992)	(1992)	(1997)	(1993)	(1993)	(1993)	(1991)	(1993)	(1993)	(1993)
MIN	352	524	473	450	500	1,136	773	1,272	1,777	840	534	503
(WY)	(2001)	(1990)	(1990)	(1990)	(1990)	(2000)	(2000)	(2000)	(1988)	(1988)	(1988)	(2000)

05487500 DES MOINES RIVER NEAR RUNNELLS, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1986 - 2003	
ANNUAL TOTAL	1,207,479		1,945,873			
ANNUAL MEAN	3,308		5,331		7,629	
HIGHEST ANNUAL MEAN					22,980	1993
LOWEST ANNUAL MEAN					1,200	1989
HIGHEST DAILY MEAN	16,700	May 15	29,900	May 9	133,000	Jul 11, 1993
LOWEST DAILY MEAN	506	Jul 26	321	Sep 9	297	Sep 17, 2000
ANNUAL SEVEN-DAY MINIMUM	591	Sep 25	370	Sep 5	319	Oct 16, 2000
MAXIMUM PEAK FLOW			30,800	May 9	134,000	Jul 11, 1993
MAXIMUM PEAK STAGE			57.96	May 10	82.88	Jul 11, 1993
ANNUAL RUNOFF (AC-FT)	2,395,000		3,860,000		5,527,000	
ANNUAL RUNOFF (CFSM)	0.28		0.46		0.65	
ANNUAL RUNOFF (INCHES)	3.85		6.21		8.89	
10 PERCENT EXCEEDS	7,040		16,500		20,900	
50 PERCENT EXCEEDS	2,070		2,130		3,640	
90 PERCENT EXCEEDS	920		623		635	

e Estimated.



05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA

LOCATION.--Lat 41°36'05", long 93°16'14", in NE¼ NE¼ sec.5, T.78 N., R.21 W., Jasper County, Hydrologic Unit 07100008, on left bank downstream side of bridge on Highway 163.

DRAINAGE AREA.--6.78 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1995 to current year.

GAGE.--Water-stage recorder. Concrete control. Datum of gage is 826.33 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharge, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.42	1.2	0.68	0.57	0.68	0.59	1.7	15	5.2	8.4	3.2	0.26
2	e9.5	1.2	0.68	e0.30	0.72	e0.31	1.6	9.9	5.6	7.7	3.0	0.17
3	3.2	1.2	e0.52	0.52	0.73	e0.40	1.6	8.7	5.7	6.9	2.7	0.14
4	2.7	1.2	e0.50	0.60	e0.61	e0.46	1.6	41	5.2	6.3	2.6	0.11
5	2.1	1.3	e0.39	0.61	e0.48	e0.40	1.5	35	4.9	9.1	2.6	0.09
6	1.9	1.2	0.72	0.55	e0.35	e0.44	1.5	19	7.5	7.1	2.6	0.07
7	1.5	1.1	0.72	0.61	e0.23	e0.39	1.5	47	8.1	24	2.3	0.05
8	1.5	1.1	0.64	0.66	e1.4	e0.34	1.5	46	11	25	2.1	0.04
9	1.4	1.0	e0.50	0.68	e0.35	e0.62	1.5	69	11	57	2.0	0.04
10	1.3	0.95	0.71	e0.45	0.56	e0.30	1.4	29	13	23	1.9	0.04
11	1.3	0.87	0.76	e0.31	0.75	e3.1	1.3	21	11	16	1.8	0.19
12	1.3	0.84	0.76	e0.22	0.71	e12	1.2	17	9.6	13	1.7	2.0
13	1.1	0.87	e0.55	e0.28	0.54	e17	1.1	15	8.6	12	1.6	0.26
14	1.1	0.87	e0.61	e0.28	0.59	e14	1.1	21	7.7	11	1.5	0.30
15	1.1	0.85	0.72	e0.24	0.57	e6.0	1.1	16	7.1	9.4	1.4	0.16
16	1.0	0.83	e0.75	e0.35	e0.35	e3.3	1.2	14	6.7	8.4	1.2	0.14
17	1.0	0.83	0.81	e0.22	e0.31	2.7	1.1	13	6.2	7.7	1.1	0.12
18	1.0	0.85	1.0	e0.70	0.57	2.2	1.1	12	6.6	7.1	0.89	0.13
19	0.92	0.83	0.86	e0.40	0.61	2.1	2.0	12	6.1	6.5	0.82	0.18
20	0.90	0.83	0.80	0.64	1.3	2.2	3.2	10	5.5	6.3	0.75	0.13
21	0.92	0.83	0.71	0.27	5.0	1.9	2.6	9.8	5.3	5.7	0.60	0.46
22	0.87	0.79	0.57	0.44	e4.9	1.8	2.2	9.2	5.0	5.3	0.53	0.36
23	0.81	0.82	0.54	e0.31	e1.3	1.8	2.1	8.7	4.8	5.0	0.49	0.21
24	0.99	0.79	0.54	0.32	e0.72	1.8	2.6	8.2	4.5	4.8	0.42	0.15
25	1.9	0.72	e0.35	0.34	e0.31	1.8	2.6	7.5	31	4.4	0.37	0.12
26	1.5	e0.59	e0.35	e0.26	e0.48	1.9	2.4	7.0	24	4.0	0.30	0.13
27	1.3	e0.65	0.60	e0.30	e0.56	2.1	2.2	6.5	13	4.2	0.27	0.13
28	1.4	0.80	0.65	0.55	0.59	2.1	2.1	6.3	13	4.3	0.22	0.11
29	1.4	e0.85	0.67	0.55	---	1.9	2.1	6.0	11	3.7	0.22	0.10
30	1.3	e1.6	e0.43	0.55	---	1.7	12	5.8	9.3	3.6	0.18	0.10
31	1.3	---	e0.40	0.67	---	1.7	---	5.2	---	3.4	0.21	---
TOTAL	49.93	28.36	19.49	13.75	26.27	89.35	62.7	550.8	273.2	320.3	41.57	6.49
MEAN	1.61	0.95	0.63	0.44	0.94	2.88	2.09	17.8	9.11	10.3	1.34	0.22
MAX	9.5	1.6	1.0	0.70	5.0	17	12	69	31	57	3.2	2.0
MIN	0.42	0.59	0.35	0.22	0.23	0.30	1.1	5.2	4.5	3.4	0.18	0.04
AC-FT	99	56	39	27	52	177	124	1,090	542	635	82	13
CFSM	0.24	0.14	0.09	0.07	0.14	0.43	0.31	2.62	1.34	1.52	0.20	0.03
IN.	0.27	0.16	0.11	0.08	0.14	0.49	0.34	3.02	1.50	1.76	0.23	0.04

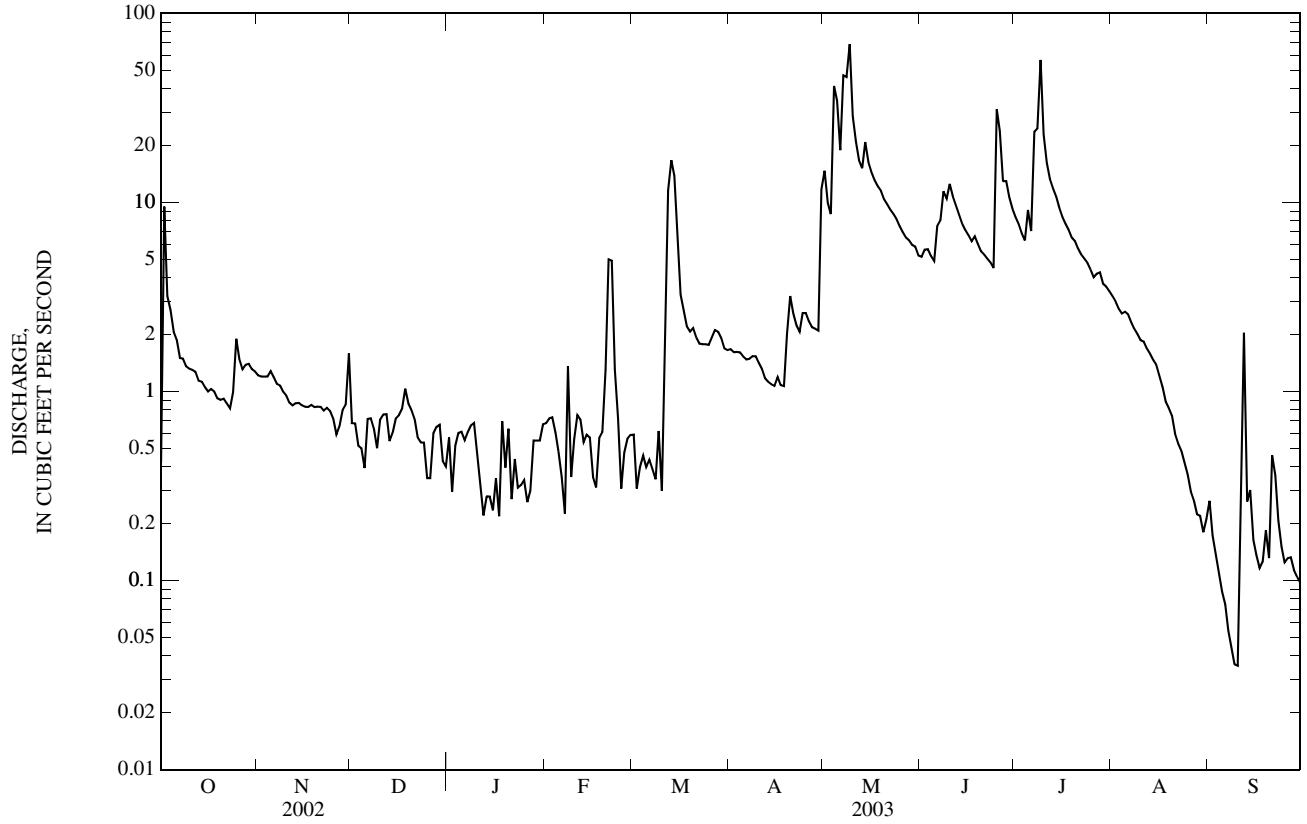
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2003, BY WATER YEAR (WY)

MEAN	1.27	1.60	1.13	1.16	5.63	5.63	4.82	12.4	13.7	6.42	3.07	0.82
MAX	3.48	5.69	3.22	3.73	19.8	19.4	13.1	25.0	31.8	13.8	10.5	1.97
(WY)	(1999)	(1999)	(1998)	(1998)	(1996)	(2001)	(1998)	(1996)	(1998)	(1998)	(1999)	(1999)
MIN	0.20	0.36	0.12	0.28	0.87	1.29	1.41	3.95	6.61	2.67	1.07	0.22
(WY)	(1996)	(2001)	(2001)	(2002)	(2002)	(2000)	(1996)	(2001)	(1997)	(2001)	(2001)	(2003)

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1996 - 2003	
ANNUAL TOTAL	1,033.81		1,482.21			
ANNUAL MEAN	2.83		4.06		4.80	
HIGHEST ANNUAL MEAN					9.24	1998
LOWEST ANNUAL MEAN					2.68	2002
HIGHEST DAILY MEAN	51	Jun 12	69	May 9	210	May 24, 1996
LOWEST DAILY MEAN	0.12	Jan 25	0.04	Sep 8a	0.04	Jan 7, 1996b
ANNUAL SEVEN-DAY MINIMUM	0.21	Jan 19	0.06	Sep 4	0.06	Sep 4, 2003
MAXIMUM PEAK FLOW			259	May 8	1,350	Jun 18, 1998
MAXIMUM PEAK STAGE			5.84	May 8	9.66	Jun 18, 1998
INSTANTANEOUS LOW FLOW			0.01	Sep 11	0.00	Nov 10, 1995
ANNUAL RUNOFF (AC-FT)	2,050		2,940		3,470	
ANNUAL RUNOFF (CFSM)	0.42		0.60		0.71	
ANNUAL RUNOFF (INCHES)	5.67		8.13		9.61	
10 PERCENT EXCEEDS	6.2		11		11	
50 PERCENT EXCEEDS	1.2		1.2		1.8	
90 PERCENT EXCEEDS	0.32		0.27		0.30	

a Also Sept. 9, 10.
b Also Sept. 8-10, 2003.
e Estimated.



05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1995 to current year.
WATER TEMPERATURES: April 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: May 1995 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 801 microsiemens Feb. 17, 1997; minimum daily, 159 microsiemens May 24, 1996.
WATER TEMPERATURES: Maximum daily, 31.5°C July 31, 2001; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L July 22, 1998; minimum daily mean, 1 mg/L Feb. 9, 2003.
SEDIMENT LOADS: Maximum daily, 1,080 tons May 24, 1996; minimum daily, 0.00 tons Feb. 1-3, 9, 10, 14-19, Feb. 28 to Mar. 2, Mar. 10, Sept. 6-10, 24, and Sept. 29, 30, 2003.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 704 microsiemens Mar. 11; minimum daily, 276 microsiemens Mar. 13.
WATER TEMPERATURES: Maximum daily, 29.8°C Aug. 27; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 480 mg/L May 9; minimum daily mean, 1.0 mg/L Feb. 9.
SEDIMENT LOADS: Maximum daily, 111 tons May 9; minimum daily, 0.00 tons Feb. 1-3, 9, 10, 14-19, Feb. 28 to Mar. 2, Mar. 10, Sept. 6-10, 24, and Sept. 29, 30.

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	523	---	---	---	541	---	515	513	482	555	---	---
2	406	459	---	482	---	519	509	---	---	---	475	---
3	571	---	539	503	517	527	---	---	501	---	482	---
4	582	---	---	---	496	---	507	---	543	---	534	489
5	578	525	500	463	---	511	515	489	---	---	489	---
6	---	---	499	465	452	---	---	515	560	---	490	590
7	565	---	585	---	---	514	---	484	---	---	444	---
8	---	---	432	479	568	---	---	508	550	---	574	---
9	514	---	---	452	546	488	---	472	---	---	565	439
10	---	---	485	432	540	526	---	495	549	---	566	---
11	---	---	444	---	398	704	524	512	549	550	567	443
12	---	455	487	---	---	---	---	---	---	---	564	---
13	---	---	432	---	421	276	---	---	---	543	472	---
14	---	---	---	466	---	278	429	---	543	---	---	---
15	516	---	492	461	---	---	431	---	---	---	---	---
16	541	---	452	502	---	454	---	517	484	---	---	---
17	---	---	523	---	527	466	488	---	---	---	565	---
18	---	453	552	---	---	---	468	---	---	---	---	---
19	---	539	526	580	---	494	631	---	---	---	---	---
20	498	---	535	---	644	514	537	---	---	498	---	---
21	---	446	---	508	---	515	525	---	---	---	---	---
22	---	444	---	421	---	518	---	---	553	516	---	---
23	---	468	468	612	510	518	507	516	---	---	563	628
24	---	485	460	604	---	514	---	---	---	---	---	---
25	560	---	---	---	545	524	524	504	---	---	---	---
26	593	429	423	---	538	516	---	---	---	---	---	597
27	526	---	425	521	532	515	493	---	555	---	488	---
28	565	---	513	---	527	517	---	520	554	---	---	---
29	564	---	---	479	---	513	---	---	563	---	---	---
30	574	---	442	549	---	521	482	---	---	---	---	---
31	525	---	444	548	---	---	---	---	---	---	571	---

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.1	---	---	---	4.1	---	17.2	11.6	18.0	19.0	---	---
2	16.8	---	---	0.5	---	0.0	22.7	---	---	---	23.1	---
3	16.1	---	0.6	1.3	0.1	0.0	---	---	14.3	---	23.0	---
4	15.5	---	---	---	0.0	---	3.2	---	18.4	---	23.4	24.1
5	16.7	---	0.4	0.3	---	0.0	6.1	11.9	---	---	21.2	---
6	---	---	2.4	1.9	0.0	---	---	12.8	18.0	---	20.3	25.8
7	15.5	---	2.4	---	---	0.2	---	15.6	---	---	22.6	---
8	---	---	1.7	1.3	0.0	---	---	9.8	17.2	---	23.4	---
9	10.8	---	---	0.2	0.0	0.0	---	16.5	---	---	22.8	25.0
10	---	---	1.6	0.0	0.0	0.9	---	13.7	16.7	---	23.5	---
11	---	---	1.6	---	0.0	4.3	4.0	10.9	17.5	19.7	19.6	26.8
12	---	9.6	0.7	---	---	---	---	---	---	---	19.7	---
13	---	---	0.2	---	0.6	2.0	---	---	---	21.8	22.0	---
14	---	---	---	0.0	---	2.6	21.4	---	22.9	---	---	---
15	10.4	---	2.8	0.0	---	---	23.4	---	---	---	---	---
16	9.5	---	1.3	0.0	---	10.0	---	14.4	16.7	---	---	---
17	---	---	1.1	---	1.0	15.2	10.5	---	---	---	24.4	---
18	---	2.0	3.8	---	---	---	9.8	---	---	---	---	---
19	---	8.8	3.2	0.0	---	3.9	10.4	---	---	---	---	---
20	10.5	---	1.2	---	3.1	6.9	10.1	---	---	22.1	---	---
21	---	6.8	---	0.0	---	7.4	11.3	---	---	---	---	---
22	---	5.2	---	0.0	---	12.7	---	---	24.1	21.5	---	---
23	---	7.1	1.1	0.0	0.0	12.0	6.0	12.2	---	---	24.9	15.2
24	---	1.8	0.0	0.0	---	17.0	---	---	---	---	---	---
25	8.4	---	---	---	0.0	12.0	9.5	19.0	---	---	---	---
26	7.8	1.5	2.4	---	1.3	10.0	---	---	---	---	---	13.6
27	5.2	---	0.0	0.0	1.2	11.6	19.2	---	19.8	---	29.8	---
28	7.5	---	2.5	---	1.6	4.6	---	14.1	19.1	---	---	---
29	8.0	---	---	1.3	---	5.1	---	---	18.1	---	---	---
30	7.3	---	1.7	0.7	---	7.2	10.5	---	---	---	---	---
31	5.0	---	3.2	0.4	---	---	---	---	---	---	19.4	---

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

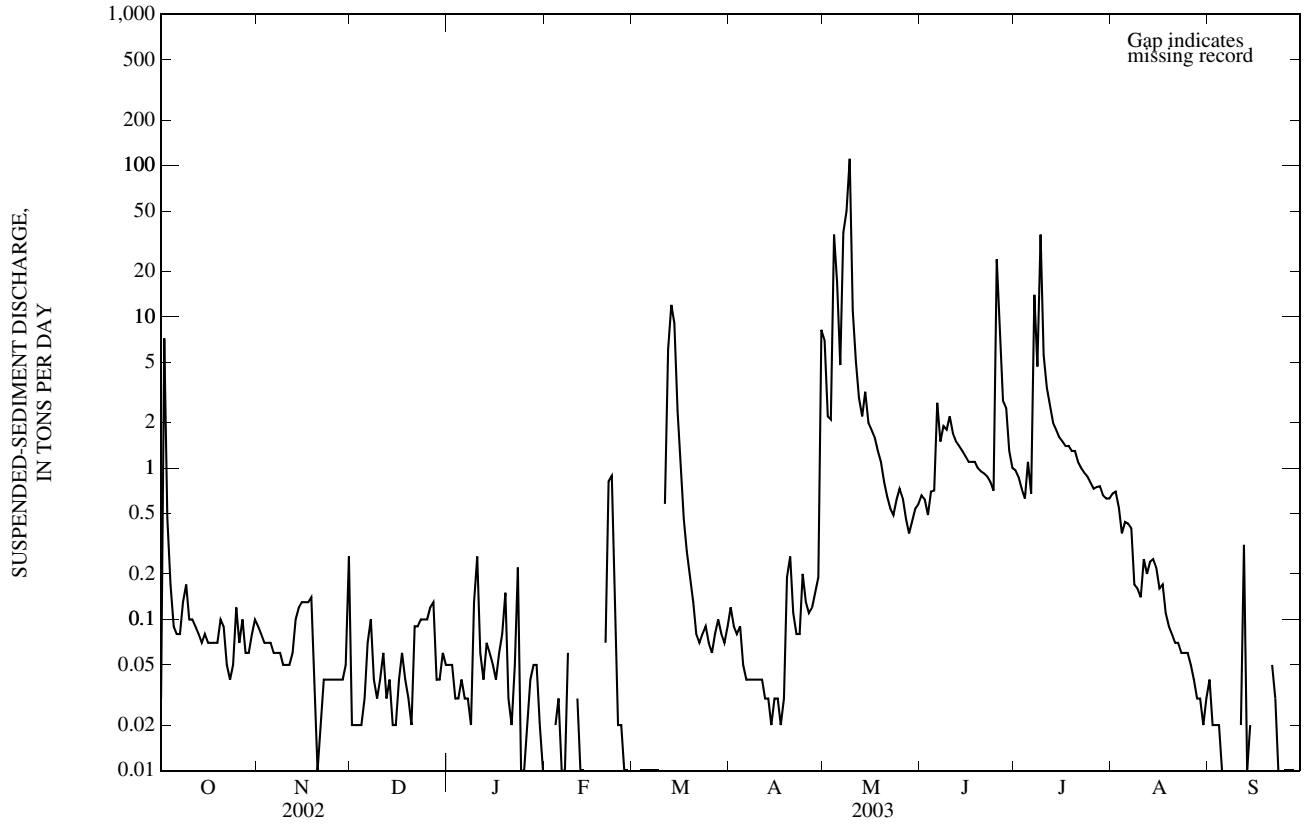
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	23	0.03	27	0.09	11	0.02	29	0.05	4	0.00	3	0.00
2	144	7.2	23	0.08	10	0.02	32	0.05	4	0.00	4	0.00
3	36	0.47	21	0.07	10	0.02	19	0.03	4	0.00	12	0.01
4	23	0.17	20	0.07	12	0.02	20	0.03	13	0.02	10	0.01
5	17	0.09	19	0.07	18	0.03	23	0.04	22	0.03	8	0.01
6	17	0.08	19	0.06	34	0.07	22	0.03	7	0.01	6	0.01
7	20	0.08	20	0.06	50	0.10	16	0.03	11	0.01	6	0.01
8	31	0.13	20	0.06	25	0.04	12	0.02	15	0.06	6	0.01
9	47	0.17	20	0.05	20	0.03	55	0.13	1	0.00	5	0.01
10	29	0.10	20	0.05	21	0.04	95	0.26	2	0.00	3	0.00
11	27	0.10	21	0.05	27	0.06	38	0.06	12	0.03	69	0.58
12	26	0.09	26	0.06	14	0.03	31	0.04	6	0.01	189	6.1
13	25	0.08	42	0.10	20	0.04	44	0.07	7	0.01	271	12
14	24	0.07	53	0.12	11	0.02	48	0.06	5	0.00	240	9.1
15	27	0.08	55	0.13	11	0.02	42	0.05	5	0.00	149	2.4
16	26	0.07	57	0.13	20	0.04	33	0.04	4	0.00	139	1.2
17	24	0.07	57	0.13	26	0.06	33	0.06	2	0.00	62	0.46
18	24	0.07	61	0.14	13	0.04	34	0.08	3	0.00	47	0.28
19	27	0.07	17	0.04	11	0.03	33	0.15	4	0.00	35	0.19
20	41	0.10	6	0.01	7	0.02	15	0.03	11	0.07	23	0.13
21	35	0.09	9	0.02	43	0.09	20	0.02	45	0.82	15	0.08
22	20	0.05	19	0.04	59	0.09	44	0.05	67	0.89	15	0.07
23	16	0.04	18	0.04	67	0.10	47	0.22	32	0.11	16	0.08
24	17	0.05	19	0.04	71	0.10	15	0.01	9	0.02	20	0.09
25	23	0.12	19	0.04	68	0.10	14	0.01	19	0.02	14	0.07
26	17	0.07	22	0.04	83	0.12	20	0.02	8	0.01	12	0.06
27	27	0.10	19	0.04	79	0.13	27	0.04	4	0.01	14	0.08
28	15	0.06	17	0.04	23	0.04	31	0.05	3	0.00	18	0.10
29	15	0.06	18	0.05	23	0.04	33	0.05	---	---	16	0.08
30	23	0.08	28	0.26	28	0.06	14	0.02	---	---	15	0.07
31	29	0.10	---	---	33	0.05	6	0.01	---	---	21	0.09
TOTAL	---	10.14	---	2.18	---	1.67	---	1.81	---	2.13	---	33.38

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	27	0.12	164	7.0	48	0.66	43	0.97	78	0.68	49	0.04
2	20	0.09	83	2.2	41	0.62	42	0.87	87	0.70	47	0.02
3	19	0.08	91	2.1	32	0.49	39	0.73	75	0.55	50	0.02
4	20	0.09	209	35	50	0.70	37	0.63	52	0.37	53	0.02
5	11	0.05	174	17	53	0.71	42	1.1	61	0.44	45	0.01
6	9	0.04	93	4.8	119	2.7	36	0.68	61	0.43	35	0.00
7	10	0.04	245	36	67	1.5	83	14	63	0.40	33	0.00
8	10	0.04	178	50	62	1.9	59	4.7	30	0.17	32	0.00
9	10	0.04	480	111	64	1.8	186	35	30	0.16	31	0.00
10	11	0.04	142	11	66	2.2	89	5.6	27	0.14	24	0.00
11	11	0.04	88	5.0	59	1.7	77	3.4	50	0.25	21	0.02
12	10	0.03	64	2.9	57	1.5	71	2.6	43	0.20	38	0.31
13	9	0.03	54	2.2	61	1.4	62	2.0	55	0.24	21	0.01
14	8	0.02	56	3.2	65	1.3	61	1.8	62	0.25	22	0.02
15	11	0.03	45	2.0	64	1.2	63	1.6	58	0.22	19	0.00
16	9	0.03	46	1.8	62	1.1	66	1.5	48	0.16	18	0.00
17	7	0.02	44	1.6	63	1.1	68	1.4	59	0.17	18	0.00
18	9	0.03	39	1.3	63	1.1	70	1.4	47	0.11	17	0.00
19	28	0.19	34	1.1	63	1.0	73	1.3	41	0.09	18	0.00
20	29	0.26	29	0.81	64	0.95	75	1.3	41	0.08	18	0.00
21	16	0.11	25	0.65	64	0.92	73	1.1	46	0.07	29	0.05
22	13	0.08	22	0.54	65	0.88	70	1.0	48	0.07	26	0.03
23	13	0.08	21	0.49	62	0.81	69	0.93	42	0.06	26	0.01
24	27	0.20	28	0.62	59	0.71	68	0.88	53	0.06	25	0.00
25	19	0.13	36	0.73	128	24	68	0.80	56	0.06	30	0.01
26	18	0.11	34	0.63	105	7.7	67	0.73	58	0.05	39	0.01
27	20	0.12	26	0.46	80	2.8	66	0.75	57	0.04	37	0.01
28	26	0.15	22	0.37	70	2.5	66	0.76	52	0.03	34	0.01
29	34	0.19	28	0.45	43	1.3	65	0.66	49	0.03	33	0.00
30	211	8.2	35	0.54	42	1.0	65	0.63	44	0.02	31	0.00
31	---	---	41	0.58	---	---	69	0.63	44	0.03	---	---
TOTAL	---	10.68	---	304.07	---	68.25	---	91.45	---	6.33	---	0.60
YEAR	532.69											

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued



05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--July 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

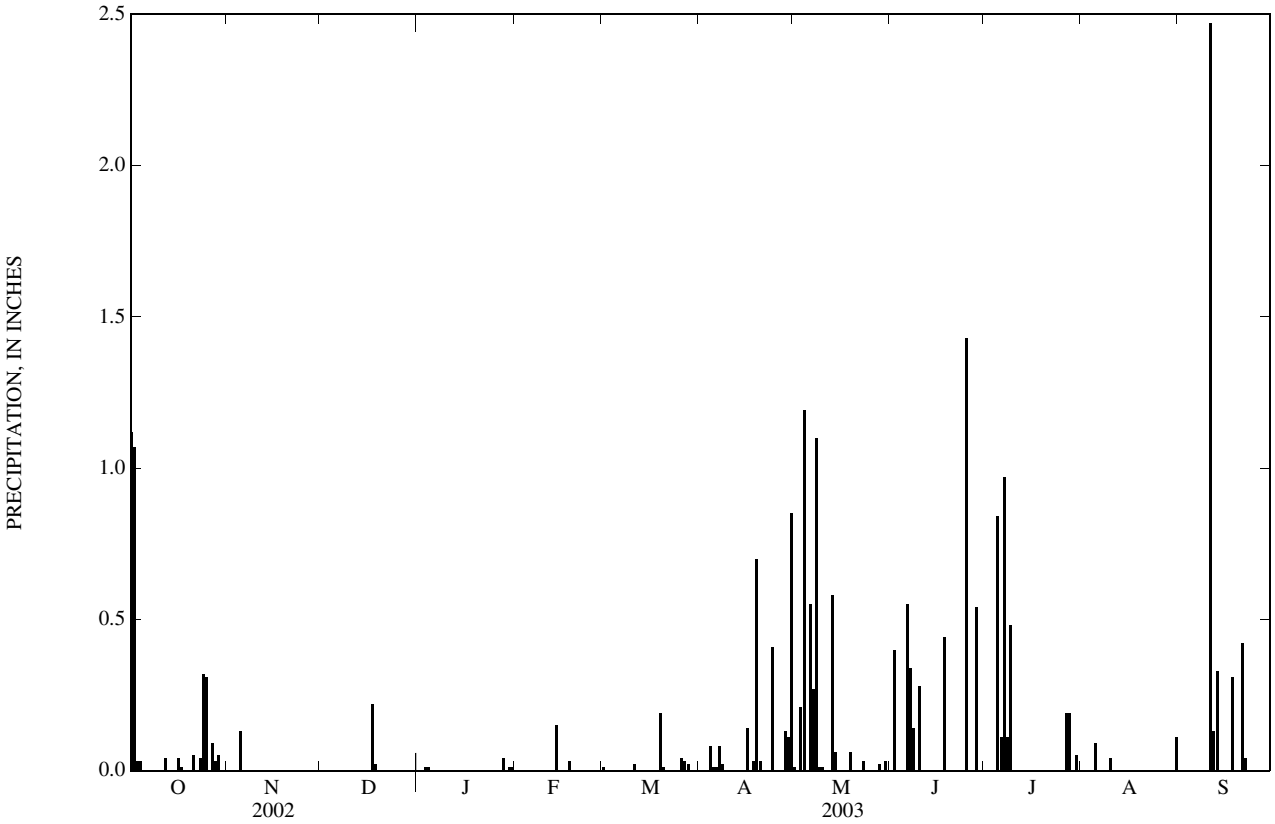
EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.53 in., July 17, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.47 in., Sept. 11.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.12	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
2	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00
3	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00
4	0.03	0.00	0.00	0.01	0.00	0.00	0.08	1.19	0.00	0.00	0.00	0.00
5	0.00	0.13	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.84	0.09	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.55	0.55	0.11	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.27	0.34	0.97	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.02	1.10	0.14	0.11	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.48	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.28	0.00	0.04	0.00
11	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	2.47
12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.33
14	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.06	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.04	0.00	---	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00
17	0.01	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.02	0.00	0.03	0.00	0.03	0.00	0.44	0.00	0.00	0.31
19	0.00	0.00	0.00	0.00	0.00	0.19	0.70	0.06	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00
21	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
24	0.32	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00
25	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.43	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
27	0.09	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.19	0.00	0.00
28	0.03	0.00	0.00	0.04	0.00	0.02	0.13	0.02	0.54	0.19	0.00	0.00
29	0.05	0.00	0.00	0.00	---	0.00	0.11	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.01	---	0.00	0.85	0.03	0.00	0.05	0.00	0.00
31	0.00	---	0.00	0.01	---	0.00	---	0.00	---	0.00	0.11	---
TOTAL	3.23	0.13	---	0.08	0.18	0.32	2.60	4.13	4.12	2.94	0.24	3.70
MEAN	0.10	0.00	---	0.00	0.01	0.01	0.09	0.13	0.14	0.09	0.01	0.12
MAX	1.12	0.13	---	0.04	0.15	0.19	0.85	1.19	1.43	0.97	0.11	2.47
MIN	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05487550 WALNUT CREEK NEAR VANDALIA, IA

LOCATION.--Lat 41°32'13", long 93°15'32", in NW¼ NE¼ sec.27, T.78 N., R.21 W., Jasper County, Hydrologic Unit 07100008, on right bank downstream side of bridge.

DRAINAGE AREA.--20.3 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1994 to current year.

GAGE.--Water-stage recorder. Concrete control. Datum of gage is 785.15 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharge, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	5.0	e1.9	1.2	e1.1	e1.2	3.3	63	10	16	6.6	e0.32
2	75	4.8	e2.0	e0.71	e1.1	e1.0	3.2	24	12	15	6.2	e0.21
3	16	4.8	e1.7	0.80	e1.1	e1.2	3.3	19	13	14	5.8	0.18
4	8.7	4.6	e1.7	0.98	e0.99	e1.4	3.4	131	11	12	5.6	0.12
5	8.4	4.7	e1.6	e0.99	e0.78	e1.4	3.2	157	9.9	18	5.5	0.07
6	7.6	4.7	1.8	0.88	e0.69	e1.3	2.9	96	17	14	5.3	0.08
7	7.0	4.3	2.2	e0.97	e0.59	e1.2	3.5	205	18	204	4.7	0.05
8	6.6	4.1	1.6	e0.99	e1.6	e1.8	3.3	192	33	329	4.1	0.04
9	6.2	4.1	e1.2	0.91	e0.74	e2.0	e3.7	304	21	170	3.8	0.04
10	6.8	4.0	1.7	e0.52	e0.91	e2.3	e3.7	125	40	120	3.7	0.04
11	6.3	3.7	2.3	0.38	e1.1	e5.9	e3.6	94	23	68	3.8	0.61
12	6.3	3.5	2.4	0.30	e0.99	e16	3.7	63	20	39	3.1	7.0
13	5.4	3.6	e2.1	0.39	e0.84	e20	3.5	54	18	30	3.1	0.80
14	5.1	3.7	e2.2	e0.39	e0.83	e18	3.3	125	16	24	2.9	1.2
15	5.2	3.4	2.3	0.33	e0.76	e11	3.3	75	14	21	3.3	0.43
16	5.0	3.3	2.2	0.43	e0.66	e6.8	3.7	53	13	18	3.1	0.24
17	5.1	3.4	2.5	e0.53	e0.61	e5.7	3.7	39	12	17	2.5	0.17
18	5.0	3.4	3.8	0.79	e0.86	e5.1	3.2	29	12	16	2.0	0.20
19	4.5	3.2	3.1	e0.69	e0.94	5.7	6.0	25	12	15	1.7	0.39
20	4.3	3.1	2.5	0.93	e1.6	6.1	12	24	11	14	1.8	0.28
21	4.3	2.6	1.9	e0.78	e5.5	5.1	8.1	22	11	13	1.1	1.3
22	3.9	2.5	1.6	1.1	e5.3	4.5	6.5	20	10	12	0.80	2.5
23	3.7	2.8	1.4	e0.94	e2.0	4.4	5.9	19	9.9	11	0.80	0.72
24	4.4	2.5	1.2	e0.85	e1.2	4.3	7.4	17	9.7	10	0.69	0.41
25	9.6	2.1	e0.80	e0.89	e0.73	4.0	7.8	16	61	9.5	0.61	0.26
26	7.0	e2.2	e0.74	e0.80	e1.0	3.8	6.5	14	93	8.2	0.58	0.22
27	5.5	e2.3	1.1	e0.86	e1.2	4.1	6.0	13	26	8.6	0.32	0.23
28	5.8	e2.2	1.5	e1.0	e1.2	3.9	6.5	13	27	9.2	0.27	0.19
29	5.7	e1.9	1.8	e1.0	---	3.4	6.8	12	21	7.9	0.25	0.18
30	5.6	e2.0	e1.2	e1.0	---	3.1	42	12	18	7.3	e0.23	0.15
31	5.2	---	e0.95	e1.1	---	3.2	---	10	---	6.9	e0.26	---
TOTAL	259.2	102.5	56.99	24.43	36.92	158.9	183.0	2,065	622.5	1,277.6	84.51	18.63
MEAN	8.36	3.42	1.84	0.79	1.32	5.13	6.10	66.6	20.8	41.2	2.73	0.62
MAX	75	5.0	3.8	1.2	5.5	20	42	304	93	329	6.6	7.0
MIN	3.7	1.9	0.74	0.30	0.59	1.0	2.9	10	9.7	6.9	0.23	0.04
AC-FT	514	203	113	48	73	315	363	4,100	1,230	2,530	168	37
CFSM	0.41	0.17	0.09	0.04	0.06	0.25	0.30	3.28	1.02	2.03	0.13	0.03
IN.	0.47	0.19	0.10	0.04	0.07	0.29	0.34	3.78	1.14	2.34	0.15	0.03

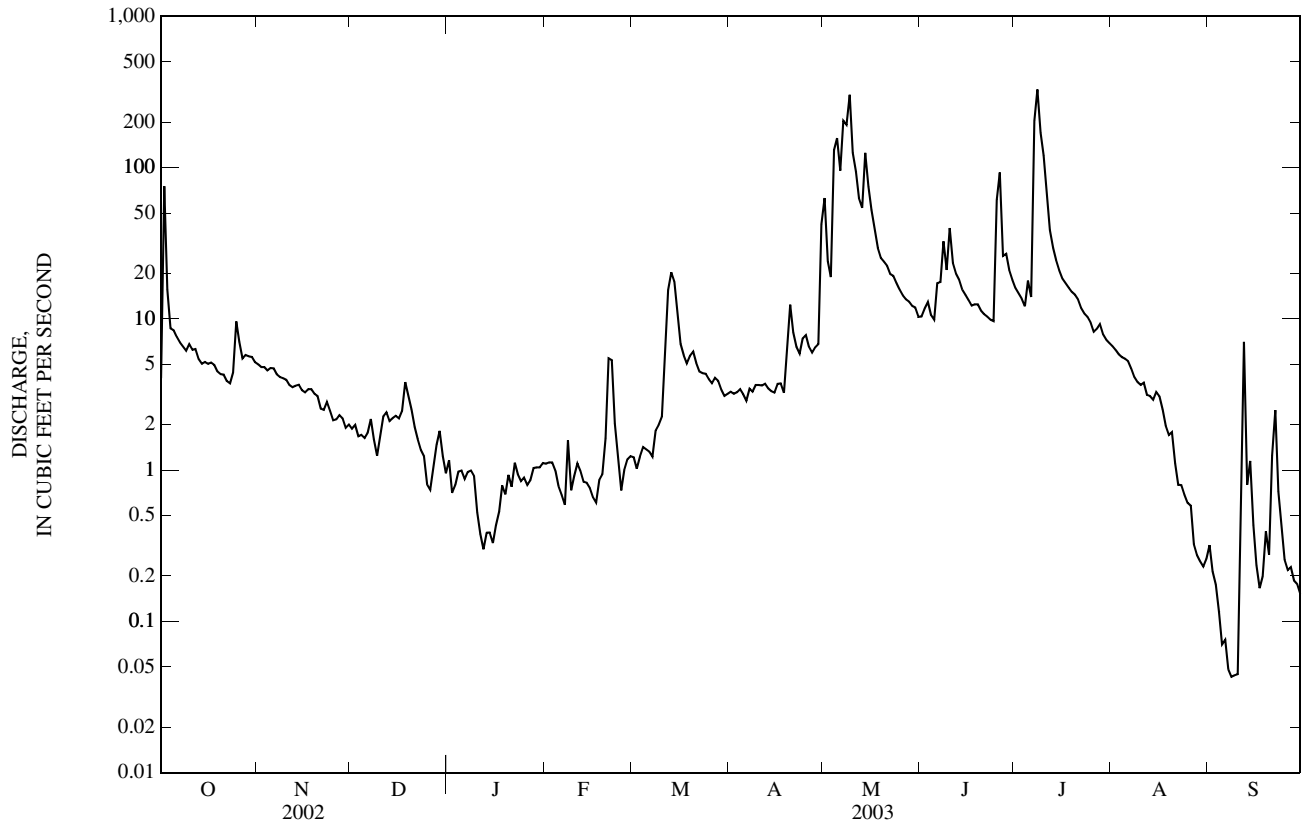
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2003, BY WATER YEAR (WY)

MEAN	3.77	4.13	2.96	3.02	17.5	17.1	18.9	44.2	33.2	19.3	7.64	2.28
MAX	8.36	13.5	8.41	10.3	58.8	66.3	47.4	86.1	97.8	42.4	31.2	7.02
(WY)	(2003)	(1999)	(1998)	(1998)	(1996)	(2001)	(1995)	(1996)	(1998)	(1998)	(1999)	(1999)
MIN	0.21	0.49	0.27	0.79	1.32	3.82	5.62	14.3	15.2	6.40	2.44	0.62
(WY)	(1995)	(1995)	(2001)	(2003)	(2003)	(2000)	(1996)	(2002)	(1995)	(2001)	(1997)	(2003)

05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1995 - 2003	
ANNUAL TOTAL	2,788.31		4,890.18			
ANNUAL MEAN	7.64		13.4		14.5	
HIGHEST ANNUAL MEAN					27.5	1998
LOWEST ANNUAL MEAN					7.13	2002
HIGHEST DAILY MEAN	125	Jun 13	329	Jul 8	573	May 24, 1996
LOWEST DAILY MEAN	0.20	Jan 1	0.04	Sep 8a	0.04	Sep 8, 2003a
ANNUAL SEVEN-DAY MINIMUM	0.46	Jan 1	0.06	Sep 4	0.06	Sep 4, 2003
MAXIMUM PEAK FLOW			1,050	Jul 7	1,380	Jun 14, 1998
MAXIMUM PEAK STAGE			9.69	Jul 7	10.85	Jun 14, 1998
INSTANTANEOUS LOW FLOW			0.04	Sep 7b	0.01	Jan 8, 1996
ANNUAL RUNOFF (AC-FT)	5,530		9,700		10,490	
ANNUAL RUNOFF (CFSM)	0.38		0.66		0.71	
ANNUAL RUNOFF (INCHES)	5.11		8.96		9.69	
10 PERCENT EXCEEDS	13		22		32	
50 PERCENT EXCEEDS	4.8		3.7		5.3	
90 PERCENT EXCEEDS	1.1		0.56		0.68	

a Also Sept. 9, 10.
b Also Sept. 8-11.
e Estimated.



05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1995 to current year.
WATER TEMPERATURES: March 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: March 1995 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 771 microsiemens Oct. 10, 1995; minimum daily, 137 microsiemens Feb. 18, 1997.
WATER TEMPERATURES: Maximum daily, 33.5°C Aug. 1, 2001; minimum daily, 0.0°C many days in winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,120 mg/L Mar. 30, 1998; minimum daily mean, 4.0 mg/L Feb. 15, 17, 19, 21, 2001.
SEDIMENT LOADS: Maximum daily, 4,600 tons Mar. 30, 1998; minimum daily, 0.00 tons Sept. 4-10, 2003.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 624 microsiemens Feb. 19; minimum daily, 231 microsiemens Mar. 13.
WATER TEMPERATURES: Maximum daily, 23.7°C Sept. 11; minimum daily, 0.0°C many days in winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,560 mg/L May 9; minimum daily mean, 8.0 mg/L Feb. 14.
SEDIMENT LOADS: Maximum daily, 1,530 tons May 9; minimum daily, 0.00 tons Sept. 4-10.

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	437	---	486	---	439	444	499	534	---	---
2	270	414	---	388	470	463	427	455	---	---	488	---
3	490	---	470	403	458	438	---	---	501	530	504	---
4	491	---	---	---	453	---	449	---	513	---	523	492
5	493	440	433	408	---	433	425	419	506	471	541	506
6	---	---	437	400	434	---	---	446	453	---	553	505
7	506	---	---	---	---	---	---	406	509	529	462	---
8	---	---	425	432	413	---	---	440	495	---	511	---
9	515	415	---	369	---	398	---	383	515	---	442	517
10	---	---	517	---	445	388	---	512	448	481	474	---
11	---	---	397	---	491	453	429	453	511	496	481	528
12	---	---	436	---	---	---	---	467	---	497	531	---
13	---	---	459	---	538	231	---	---	496	504	---	---
14	---	---	---	501	---	291	394	---	---	---	---	---
15	418	---	445	497	---	---	416	453	---	502	---	---
16	459	---	432	486	---	347	---	---	---	513	---	---
17	---	---	463	---	530	366	398	---	522	475	546	---
18	---	408	476	---	481	---	430	467	---	---	---	570
19	---	---	---	---	624	431	453	---	---	516	---	---
20	490	---	409	466	317	443	478	---	---	477	---	---
21	---	429	402	459	---	463	---	---	---	511	---	---
22	---	445	---	415	---	463	---	---	529	511	---	---
23	---	414	401	417	432	444	---	---	---	---	445	513
24	---	444	400	456	---	---	432	463	---	---	---	---
25	---	---	---	---	512	453	452	500	---	---	---	---
26	505	394	465	---	461	422	---	499	---	---	---	---
27	509	---	405	438	469	442	438	493	520	---	---	---
28	504	---	395	---	471	430	---	---	521	---	---	---
29	499	---	---	562	---	454	---	---	525	---	---	---
30	494	---	389	446	---	448	387	---	530	---	---	---
31	455	---	393	434	---	---	---	---	---	---	501	---

05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1.2	---	1.7	---	17.2	11.8	---	18.5	---	---
2	16.0	4.7	---	0.0	0.6	0.0	20.6	13.7	---	---	---	---
3	15.1	---	0.0	0.2	0.0	0.0	---	---	---	---	---	---
4	15.7	---	---	---	0.0	---	6.7	---	---	---	---	---
5	15.2	4.0	0.0	0.1	---	0.0	6.4	12.9	---	---	---	---
6	---	---	4.3	1.0	0.0	---	---	12.3	---	---	---	---
7	13.1	---	---	---	---	---	---	10.1	---	---	---	---
8	---	---	0.4	2.0	0.0	---	---	9.8	---	---	---	---
9	12.7	10.0	---	0.5	---	0.0	---	16.3	---	---	---	22.8
10	---	---	1.1	---	0.0	0.3	---	12.6	---	---	---	---
11	---	---	1.3	---	0.0	2.3	6.5	13.1	---	---	---	23.7
12	---	---	0.9	---	---	---	---	8.7	---	---	22.0	---
13	---	---	1.1	---	3.3	0.4	---	---	---	---	---	---
14	---	---	---	0.0	---	2.6	19.6	---	---	---	---	---
15	10.3	---	1.2	0.0	---	---	23.6	8.7	---	---	---	---
16	7.7	---	0.4	0.0	---	5.4	---	---	---	---	---	---
17	---	---	2.0	---	0.3	4.9	8.9	---	---	---	---	---
18	---	3.3	1.6	---	1.8	---	12.2	---	---	---	---	20.0
19	---	---	---	---	1.9	4.1	10.8	---	---	---	---	---
20	7.1	---	0.7	0.0	1.6	5.8	9.1	---	---	---	---	---
21	---	5.2	0.4	0.0	---	5.2	---	---	---	---	---	---
22	---	3.0	---	0.0	---	8.4	---	---	---	---	---	---
23	---	5.2	0.3	0.0	0.0	8.3	---	---	---	---	---	15.4
24	---	1.6	0.0	0.0	---	---	10.5	---	---	---	---	---
25	---	---	---	---	0.0	11.8	13.5	---	---	---	---	---
26	8.5	0.4	1.4	---	0.3	10.0	---	---	---	---	---	---
27	5.2	---	0.9	0.0	3.6	10.1	20.1	---	---	---	---	---
28	6.2	---	0.3	---	0.9	2.7	---	---	---	---	---	---
29	7.0	---	---	0.3	---	4.4	---	---	---	---	---	---
30	6.9	---	1.3	0.6	---	8.7	11.0	---	---	---	---	---
31	4.6	---	0.9	0.4	---	---	---	---	---	---	---	---

05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

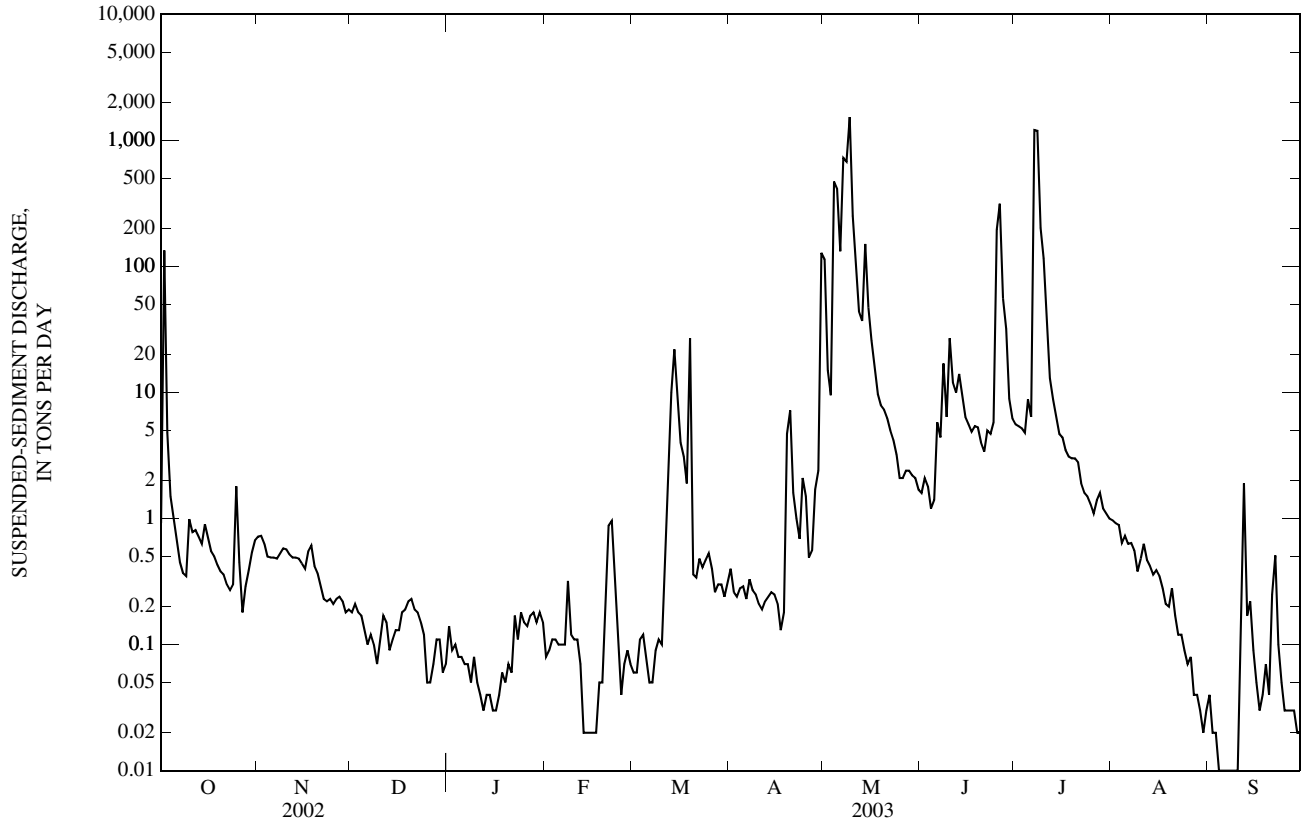
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	62	0.92	54	0.72	35	0.18	44	0.14	28	0.08	20	0.06
2	460	134	57	0.73	38	0.21	48	0.09	29	0.09	21	0.06
3	106	4.8	49	0.63	40	0.18	46	0.10	37	0.11	33	0.11
4	62	1.5	40	0.50	36	0.17	31	0.08	41	0.11	33	0.12
5	43	0.99	39	0.49	30	0.13	29	0.08	46	0.10	21	0.08
6	33	0.67	38	0.49	21	0.10	29	0.07	52	0.10	13	0.05
7	24	0.45	42	0.48	21	0.12	26	0.07	65	0.10	16	0.05
8	21	0.37	48	0.53	23	0.10	18	0.05	75	0.32	19	0.09
9	21	0.35	53	0.58	23	0.07	28	0.08	62	0.12	21	0.11
10	52	0.99	54	0.57	24	0.11	39	0.05	46	0.11	16	0.10
11	46	0.78	53	0.52	28	0.17	40	0.04	37	0.11	23	0.37
12	47	0.81	52	0.49	24	0.15	38	0.03	25	0.07	55	2.4
13	49	0.72	51	0.49	16	0.09	36	0.04	11	0.02	192	10
14	46	0.63	50	0.48	18	0.11	36	0.04	8	0.02	457	22
15	65	0.90	48	0.44	21	0.13	31	0.03	10	0.02	300	8.9
16	51	0.70	46	0.40	22	0.13	26	0.03	11	0.02	220	4.0
17	40	0.55	60	0.55	28	0.18	26	0.04	13	0.02	200	3.1
18	38	0.50	67	0.61	19	0.19	27	0.06	20	0.05	138	1.9
19	35	0.43	49	0.42	27	0.22	28	0.05	19	0.05	59	27
20	33	0.38	45	0.37	34	0.23	28	0.07	40	0.17	22	0.36
21	31	0.36	43	0.29	33	0.19	28	0.06	59	0.88	25	0.34
22	29	0.30	34	0.23	40	0.18	56	0.17	67	0.96	39	0.48
23	27	0.27	29	0.22	39	0.15	42	0.11	64	0.35	35	0.41
24	25	0.30	34	0.23	34	0.12	78	0.18	44	0.14	40	0.47
25	64	1.8	37	0.21	25	0.05	63	0.15	19	0.04	49	0.53
26	22	0.45	39	0.23	26	0.05	67	0.14	27	0.07	40	0.40
27	12	0.18	38	0.24	25	0.07	74	0.17	28	0.09	24	0.26
28	19	0.29	37	0.22	29	0.11	65	0.18	21	0.07	29	0.30
29	25	0.39	36	0.18	23	0.11	54	0.15	---	---	34	0.30
30	36	0.54	35	0.19	18	0.06	65	0.18	---	---	30	0.24
31	48	0.67	---	---	26	0.07	51	0.15	---	---	36	0.31
TOTAL	---	156.99	---	12.73	---	4.13	---	2.88	---	4.39	---	84.90

05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	45	0.40	582	114	59	1.6	130	5.6	55	0.97	44	0.04
2	31	0.26	232	15	64	2.1	136	5.4	55	0.92	39	0.02
3	27	0.24	186	9.5	50	1.8	141	5.2	57	0.89	35	0.02
4	30	0.28	1,010	472	43	1.2	147	4.8	42	0.64	30	0.00
5	33	0.29	958	415	54	1.4	176	8.8	49	0.73	31	0.00
6	29	0.23	497	132	113	5.8	170	6.4	45	0.63	31	0.00
7	35	0.33	1,090	728	89	4.4	763	1,210	51	0.64	33	0.00
8	30	0.27	876	680	195	17	890	1,190	50	0.56	36	0.00
9	25	0.25	1,560	1,530	110	6.4	403	202	37	0.38	38	0.00
10	21	0.21	737	252	217	27	352	116	49	0.48	39	0.00
11	18	0.19	364	94	193	12	172	33	62	0.63	41	0.07
12	22	0.22	261	44	192	10	122	13	56	0.47	94	1.9
13	26	0.24	253	37	279	14	110	8.8	51	0.42	80	0.17
14	29	0.26	425	151	223	9.4	96	6.4	46	0.36	72	0.22
15	28	0.25	226	47	164	6.4	82	4.7	44	0.39	73	0.09
16	21	0.21	181	26	157	5.6	89	4.4	42	0.35	74	0.05
17	13	0.13	149	16	148	4.9	76	3.5	41	0.28	75	0.03
18	21	0.18	122	9.7	159	5.4	72	3.1	40	0.21	77	0.04
19	231	4.7	116	7.9	157	5.3	74	3.0	44	0.20	69	0.07
20	183	7.2	113	7.3	131	4.0	76	3.0	59	0.28	57	0.04
21	75	1.6	104	6.3	119	3.4	76	2.8	56	0.17	63	0.25
22	59	1.0	93	5.0	179	5.0	59	1.9	56	0.12	73	0.51
23	43	0.69	81	4.2	177	4.7	54	1.6	55	0.12	51	0.10
24	90	2.1	69	3.2	221	5.8	52	1.5	46	0.09	49	0.05
25	68	1.5	51	2.1	610	195	51	1.3	40	0.07	49	0.03
26	28	0.49	55	2.1	1,160	314	49	1.1	49	0.08	49	0.03
27	35	0.56	66	2.4	779	56	58	1.4	50	0.04	50	0.03
28	97	1.7	69	2.4	419	32	65	1.6	48	0.04	50	0.03
29	128	2.4	67	2.2	156	8.9	56	1.2	46	0.03	50	0.02
30	805	128	64	2.1	126	6.2	55	1.1	38	0.02	50	0.02
31	---	---	61	1.7	---	---	55	1.0	45	0.03	---	---
TOTAL	---	156.38	---	4,821.1	---	776.7	---	2,853.6	---	11.24	---	3.83
YEAR	8,888.87											

05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued



05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--April 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Records good except for the winter period, which is poor due to intermittent snow accumulation and subsequent melting.

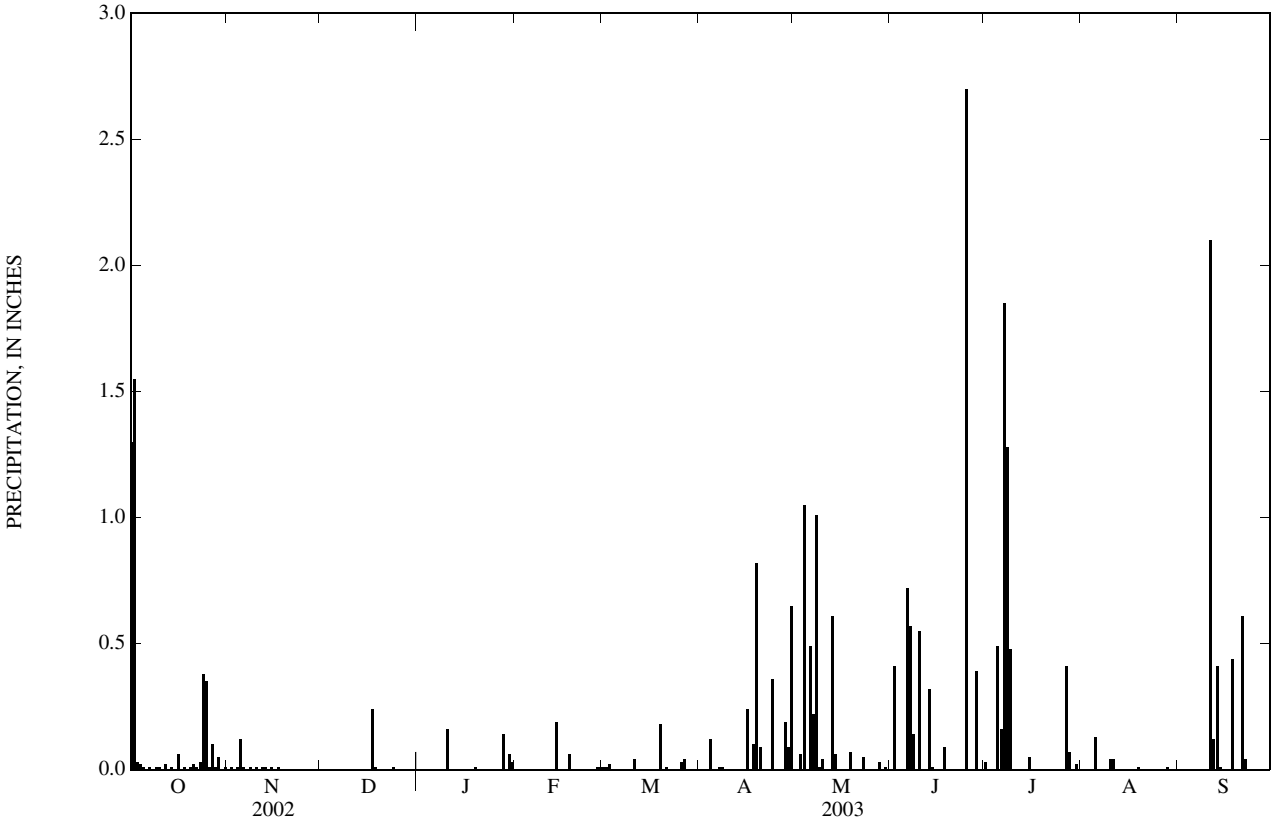
EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 4.72 in., May 9, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.70 in., June 25.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.30	0.00	---	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.00	---
2	1.55	0.01	---	0.00	0.00	0.01	0.00	0.00	0.41	0.00	0.00	0.00
3	0.03	0.00	---	0.00	0.00	0.02	0.00	0.06	0.00	0.00	0.00	0.00
4	0.02	0.01	0.00	0.00	0.00	0.00	0.12	1.05	0.00	0.00	0.00	0.00
5	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.13	0.00
6	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.49	0.72	0.16	0.00	0.00
7	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.22	0.57	1.85	0.00	0.00
8	0.00	0.01	0.00	0.00	0.00	0.00	0.01	1.01	0.14	1.28	0.00	0.00
9	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.48	0.00	0.00
10	0.01	0.01	0.00	0.16	0.00	0.00	0.00	0.04	0.55	0.00	0.04	0.00
11	0.00	0.00	0.00	0.00	0.00	0.04	---	0.00	0.00	0.00	0.04	2.10
12	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.61	0.32	0.00	0.00	0.41
14	0.01	0.00	0.00	0.00	0.19	0.00	0.00	0.06	0.01	0.00	0.00	0.01
15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
16	0.06	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00
17	0.00	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.01	0.00	0.01	0.00	0.06	0.00	0.10	0.00	0.09	0.00	0.00	0.44
19	0.00	0.00	0.00	0.01	0.00	0.18	0.82	0.07	0.00	0.00	0.01	0.00
20	0.01	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
21	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.61
22	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
23	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
24	0.38	0.00	0.01	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00
25	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70	0.00	0.00	0.00
26	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
27	0.10	0.00	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.41	0.00	0.00
28	0.01	0.00	0.00	0.14	0.01	0.00	0.19	0.03	0.39	0.07	0.01	0.00
29	0.05	---	0.00	0.00	---	0.00	0.09	0.00	0.00	0.00	0.00	0.00
30	0.00	---	0.00	0.06	---	0.00	0.65	0.01	0.00	0.02	---	0.00
31	0.01	---	0.00	0.03	---	0.00	---	0.00	---	0.00	---	---
TOTAL	4.02	---	---	0.40	0.27	0.34	---	3.71	5.90	4.84	---	---
MEAN	0.13	---	---	0.01	0.01	0.01	---	0.12	0.20	0.16	---	---
MAX	1.55	---	---	0.16	0.19	0.18	---	1.05	2.70	1.85	---	---
MIN	0.00	---	---	0.00	0.00	0.00	---	0.00	0.00	0.00	---	---

05487550 WALNUT CREEK NEAR VANDALIA, IA—Continued



THIS PAGE IS INTENTIONALLY BLANK

05487980 WHITE BREAST CREEK NEAR DALLAS, IA

LOCATION.--Lat 41°14'41", long 93°16'08", in NW¼ NW¼ sec.3, T.74 N., R.21 W., Marion County, Hydrologic Unit 07100008, on left bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Kirk Branch, and 1.7 mi northwest of Dallas.

DRAINAGE AREA.--342 mi^2.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 759.21 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 11, 1962 reached a stage of 28.87 ft, from floodmark, discharge, about 12,000 ft^3/s. Flood of June 6, 1947 may have been slightly higher.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	6.0	e4.3	e3.9	e3.8	e8.2	18	86	13	79	4.8	2.5
2	54	5.3	e4.1	e3.4	e4.3	e7.4	16	62	16	66	3.7	2.2
3	45	5.0	e4.0	e2.9	e4.9	e6.8	16	47	23	48	3.5	2.2
4	23	4.8	e4.4	e2.7	e4.3	e6.6	17	2,560	22	40	3.5	2.1
5	20	5.1	e4.2	e2.5	e3.9	e7.6	18	2,170	18	40	3.4	1.6
6	13	5.8	e4.0	e2.2	e2.9	e7.4	17	603	53	34	3.4	1.4
7	9.0	5.7	e4.2	e3.2	e1.9	e7.1	27	291	122	54	3.3	1.4
8	6.7	5.2	e4.0	e4.8	e1.7	e7.9	37	278	93	75	3.4	1.3
9	5.5	5.3	e3.7	e3.4	e1.5	e8.6	33	1,660	56	57	3.3	1.4
10	4.4	5.1	e3.9	e1.4	e1.5	e9.2	37	1,100	328	42	3.1	1.3
11	4.0	4.7	e3.8	e1.9	e1.5	e16	31	742	224	41	3.5	1.8
12	3.6	4.4	e4.0	e2.7	e1.6	e51	25	303	127	36	7.1	18
13	3.4	4.6	e3.9	e2.8	e1.6	e111	21	196	69	32	4.4	29
14	3.0	4.8	e4.7	e2.7	e2.1	e148	19	222	45	24	3.7	74
15	2.8	4.7	e5.1	e2.3	e2.6	e168	17	236	35	19	3.2	36
16	3.0	4.9	e4.4	e2.7	e2.3	e130	16	142	28	16	2.9	11
17	2.9	5.6	e4.9	e2.7	e2.6	e110	16	100	26	14	2.6	5.7
18	3.2	3.7	e7.7	e2.4	e3.0	104	15	81	28	13	2.6	3.8
19	3.2	4.8	e11	e2.3	e10	79	32	73	24	11	2.3	4.0
20	3.1	4.7	e8.8	e2.3	e38	70	157	68	20	10	2.1	4.0
21	3.2	5.5	e8.0	e2.2	e188	54	145	e58	18	9.0	2.2	4.5
22	3.2	5.3	e6.6	e3.8	e234	43	95	e51	17	7.8	2.0	5.5
23	3.5	5.2	e3.6	e1.8	e108	36	54	e45	16	7.7	1.8	7.0
24	4.2	4.8	e4.3	e2.0	e34	31	74	e41	14	5.7	1.7	6.3
25	9.7	4.4	e4.6	e2.2	e17	27	133	e36	1,770	5.0	1.5	7.7
26	12	e4.3	e4.8	e2.2	e13	23	124	e31	1,540	4.7	1.4	4.2
27	10	e3.6	e4.1	e1.4	e15	23	79	e27	511	4.4	1.3	2.9
28	7.2	e3.8	e4.5	e2.1	e10	23	50	25	210	4.2	1.3	2.2
29	6.9	e4.1	e4.7	e2.6	---	21	43	22	152	4.3	1.5	1.9
30	8.1	e3.9	e4.7	e2.8	---	18	147	18	111	4.2	1.5	1.8
31	6.7	---	e4.4	e3.5	---	18	---	15	---	4.3	1.9	---
TOTAL	294.0	145.1	153.4	81.8	715.0	1,380.8	1,529	11,389	5,729	812.3	87.9	248.7
MEAN	9.48	4.84	4.95	2.64	25.5	44.5	51.0	367	191	26.2	2.84	8.29
MAX	54	6.0	11	4.8	234	168	157	2,560	1,770	79	7.1	74
MIN	2.8	3.6	3.6	1.4	1.5	6.6	15	15	13	4.2	1.3	1.3
AC-FT	583	288	304	162	1,420	2,740	3,030	22,590	11,360	1,610	174	493
CFSM	0.03	0.01	0.01	0.01	0.07	0.13	0.15	1.07	0.56	0.08	0.01	0.02
IN.	0.03	0.02	0.02	0.01	0.08	0.15	0.17	1.24	0.62	0.09	0.01	0.03

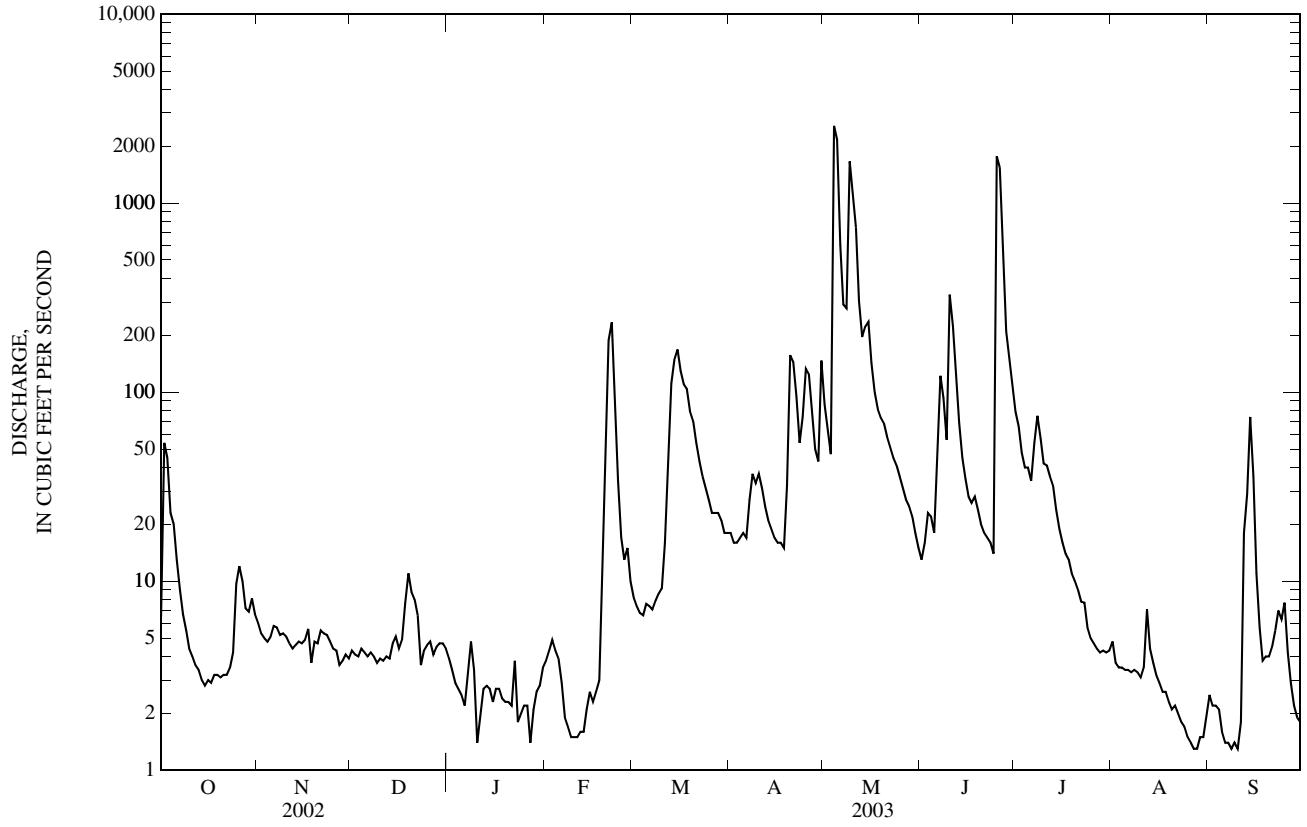
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2003, BY WATER YEAR (WY)

MEAN	114	107	102	61.3	163	339	436	401	289	271	113	174
MAX	1,153	756	718	601	718	1,056	1,592	1,823	1,146	3,641	1,202	1,902
(WY)	(1974)	(1984)	(1983)	(1974)	(1973)	(1998)	(1991)	(1996)	(1967)	(1993)	(1993)	(1992)
MIN	1.16	1.35	0.80	0.49	1.82	4.05	3.85	6.44	5.13	1.47	2.09	1.11
(WY)	(1990)	(1977)	(1964)	(1977)	(1964)	(1964)	(1989)	(1980)	(1977)	(1988)	(1971)	(1968)

05487980 WHITE BREAST CREEK NEAR DALLAS, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1963 - 2003	
ANNUAL TOTAL	26,282.3		22,566.0			
ANNUAL MEAN	72.0		61.8		214	
HIGHEST ANNUAL MEAN					816	1993
LOWEST ANNUAL MEAN					17.1	1989
HIGHEST DAILY MEAN	3,090	May 12	2,560	May 4	24,700	Sep 16, 1992
LOWEST DAILY MEAN	2.8	Oct 15	1.3	Aug 27	0.02	Oct 14, 1989
ANNUAL SEVEN-DAY MINIMUM	3.0	Oct 14	1.5	Aug 24	0.05	Aug 9, 1989
MAXIMUM PEAK FLOW			6,740	Jun 25	37,300	Jul 16, 1982
MAXIMUM PEAK STAGE			19.15	Jun 25	33.45	Jul 16, 1982
INSTANTANEOUS LOW FLOW			1.2	Aug 28a		
ANNUAL RUNOFF (AC-FT)	52,130		44,760		155,300	
ANNUAL RUNOFF (CFSM)	0.21		0.18		0.63	
ANNUAL RUNOFF (INCHES)	2.86		2.45		8.51	
10 PERCENT EXCEEDS	148		106		422	
50 PERCENT EXCEEDS	16		6.5		34	
90 PERCENT EXCEEDS	4.4		2.2		2.7	

a Also Sept. 10, 11.
e Estimated.



05488100 LAKE RED ROCK NEAR PELLA, IA

LOCATION.--Lat 41°22'11", long 92°58'48", in NE¼ NW¼ sec.19, T.76 N., R.18 W., Marion County, Hydrologic Unit O7100008, at outlet works near right end of Red Rock Dam on Des Moines River, 1.4 mi upstream from Lake Creek, 4.5 mi southwest of Pella, and at mile 142.3.

DRAINAGE AREA.--12,323 mi^2.

PERIOD OF RECORD.--March 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is at NGVD 0f 1929 level (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1969. Storage began in March 1969. Releases controlled through 14 concrete conduits extending through the concrete ogee spillway section into the stilling basin. Inlet invert elevation at 690 ft above sea level. Maximum design discharge through the conduits is 37,500 ft^3/s but normal flood control operation limits maximum outflow to 30,000 ft^3/s. Spillway section consists of 5 tainter gates, 41 ft wide and 45 ft high, on concrete ogee crest at elevation 736 ft. The storage capacity of the reservoir at full flood-control pool level, 780 ft, is 1,489,900 acre-ft, surface area, 65,440 acres. Conservation pool level, 742 feet, is 265,500 acre-feet, surface area, 19,100 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will maintain an elevation of 742 ft with minimum release of 300 ft^3/s and maximum release of 30,000 ft^3/s during the non-growing season, providing discharges at Ottumwa and Keosauqua do not exceed 30,000 ft^3/s and 35,000 ft^3/s respectively. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage. Prior to October 1, 2000 published as contents in acre feet, and as elevation in feet NGVD thereafter.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

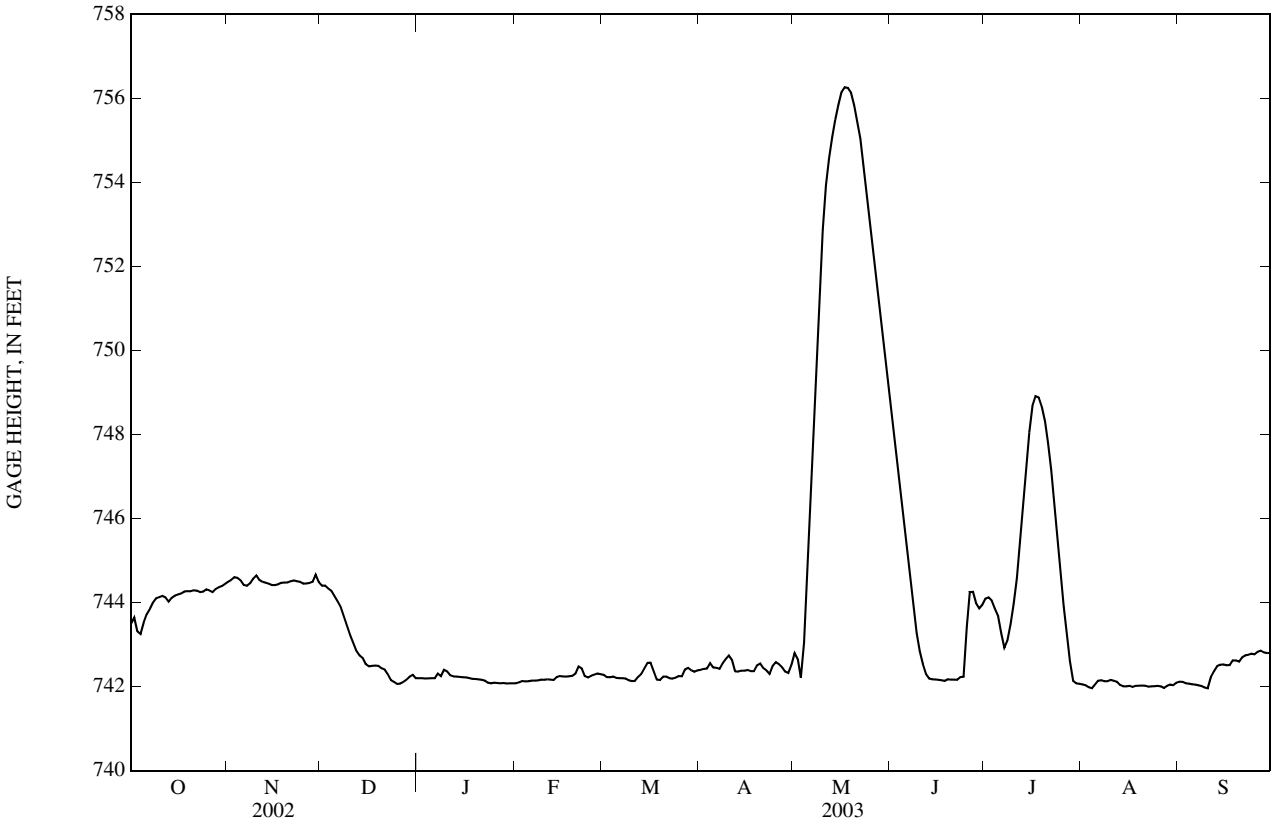
EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 782.67 ft July 13, 1993; minimum elevation, 719.68 ft Feb. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 756.28 ft May 18; minimum elevation, 742.04 ft July 30.

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY OBSERVATION AT 0600 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	743.34	744.46	744.41	742.17	742.08	742.29	742.40	742.58	749.40	743.98	742.06	742.11
2	743.55	744.51	744.40	742.21	742.08	742.28	742.40	742.87	748.69	744.13	742.05	742.12
3	743.67	744.55	744.41	742.20	742.11	742.21	742.43	742.58	747.97	744.12	742.03	742.11
4	743.20	744.62	744.31	742.19	742.14	742.23	742.43	742.09	747.19	744.03	741.97	742.07
5	743.27	744.58	744.27	742.20	742.12	742.24	742.60	743.36	746.38	743.80	741.96	742.07
6	743.61	744.51	744.11	742.20	742.13	742.20	742.41	745.27	745.66	743.66	742.08	742.05
7	743.76	744.39	744.00	742.20	742.15	742.20	742.46	746.78	745.07	743.15	742.16	742.05
8	743.88	744.40	743.85	742.35	742.14	742.20	742.41	748.05	744.45	742.85	742.15	742.03
9	744.04	744.48	743.62	742.21	742.15	742.19	742.60	749.46	743.76	743.18	742.12	742.01
10	744.12	744.60	743.39	742.46	742.17	742.14	742.67	751.35	743.11	743.59	742.13	741.97
11	744.13	744.66	743.18	742.33	742.16	742.13	742.76	753.38	742.76	744.09	742.17	741.96
12	744.17	744.50	742.99	742.25	742.18	742.14	742.59	754.12	742.46	744.73	742.13	742.32
13	744.11	744.49	742.80	742.24	742.16	742.26	742.29	754.71	742.24	745.57	742.11	742.38
14	743.99	744.47	742.72	742.24	742.16	742.32	742.38	755.20	742.18	746.44	742.02	742.52
15	744.16	744.44	742.67	742.23	742.25	742.47	742.38	755.59	742.17	747.44	742.00	742.52
16	744.17	744.41	742.49	742.22	742.25	742.60	742.38	755.94	742.17	748.26	742.01	742.53
17	744.20	744.42	742.48	742.22	742.24	742.56	742.40	756.22	742.16	748.83	742.02	742.50
18	744.22	744.44	742.50	742.20	742.24	742.30	742.36	756.28	742.15	748.94	741.98	742.52
19	744.28	744.48	742.50	742.18	742.25	742.12	742.37	756.24	742.13	748.86	742.03	742.66
20	744.27	744.48	742.49	742.18	742.26	742.17	742.55	756.11	742.19	748.60	742.02	742.61
21	744.27	744.48	742.42	742.17	742.33	742.26	742.55	755.75	742.16	748.22	742.03	742.59
22	744.30	744.52	742.40	742.16	742.53	742.23	742.41	755.37	742.17	747.66	742.02	742.73
23	744.28	744.53	742.26	742.14	742.40	742.19	742.38	754.93	742.16	746.98	741.99	742.75
24	744.24	744.50	742.12	742.08	742.20	742.19	742.28	754.40	742.25	746.17	742.01	742.76
25	744.27	744.49	742.11	742.08	742.22	742.22	742.56	753.88	742.23	745.27	742.01	742.79
26	744.33	744.44	742.05	742.10	742.27	742.26	742.59	753.30	743.80	744.47	742.02	742.76
27	744.28	744.46	742.08	742.08	742.29	742.24	742.52	752.68	744.40	743.72	742.00	742.85
28	744.24	744.47	742.12	742.08	742.32	742.46	742.44	752.08	744.21	743.11	741.96	742.86
29	744.35	744.50	742.18	742.09	---	742.44	742.33	751.48	743.90	742.43	742.04	742.80
30	744.37	744.72	742.26	742.07	---	742.37	742.32	750.81	743.85	742.04	742.05	742.80
31	744.40	---	742.29	742.08	---	742.35	---	750.19	---	742.09	742.03	---
MEAN	744.05	744.50	742.96	742.19	742.21	742.27	742.46	751.39	743.85	745.17	742.04	742.43
MAX	744.40	744.72	744.41	742.46	742.53	742.60	742.76	756.28	749.40	748.94	742.17	742.86
MIN	743.20	744.39	742.05	742.07	742.08	742.12	742.28	742.09	742.13	742.04	741.96	741.96

05488100 LAKE RED ROCK NEAR PELLA, IA—Continued



05488110 DES MOINES RIVER NEAR PELLA, IA

LOCATION.--Lat 41°21'38", long 92°58'23", in SW¼ SW¼ SE¼ sec.19, T.76 N., R.18 W., Marion County, Hydrologic Unit 07100009, on right bank, 0.4 mile downstream of outlet of Red Rock Reservoir, and 0.75 mile upstream of Lake Creek.

DRAINAGE AREA.--12,330 mi^2.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 600.00 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Lake Red Rock (station 05488100) 0.4 mi upstream. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	378	2,190	1,610	1,060	612	1,400	1,870	11,900	18,100	18,100	3,800	408
2	1,470	2,410	1,220	1,190	618	1,290	2,010	16,600	18,100	18,200	3,430	525
3	4,810	2,410	2,080	1,320	579	1,070	2,040	17,500	18,100	18,100	3,420	647
4	3,060	3,080	3,120	1,300	584	836	2,090	14,900	17,600	17,200	3,030	559
5	384	3,520	3,350	1,280	605	846	2,230	13,400	16,500	16,600	1,940	466
6	3,380	3,340	3,550	1,290	586	871	2,380	15,400	15,300	16,600	1,580	465
7	6,840	2,700	3,510	1,310	607	836	2,360	17,300	14,800	17,100	2,140	467
8	7,650	2,010	3,520	1,300	e605	829	2,180	17,700	15,300	17,700	2,470	418
9	6,800	2,000	3,530	1,260	e605	838	1,890	15,900	15,600	17,700	2,120	324
10	6,140	2,580	3,510	1,280	e605	849	1,900	15,400	15,900	17,800	1,800	279
11	5,660	3,100	3,490	1,030	592	856	3,400	17,000	16,600	17,800	1,880	277
12	5,390	3,040	3,480	852	603	853	4,590	17,900	16,200	17,700	1,970	281
13	5,400	2,860	2,700	843	608	1,480	3,840	18,400	14,400	17,700	1,840	283
14	4,110	2,590	2,200	828	623	1,950	4,090	18,300	12,700	17,800	1,760	263
15	3,310	2,400	2,200	838	627	2,560	4,850	18,400	11,500	17,900	1,650	265
16	3,330	2,100	2,240	833	608	4,860	5,030	18,500	10,600	18,100	1,440	264
17	3,340	1,930	2,230	848	630	6,310	4,980	18,500	9,900	18,200	1,350	283
18	3,340	1,920	2,200	832	616	5,830	4,780	18,500	8,790	18,200	1,220	271
19	3,320	1,990	2,190	848	615	4,240	4,570	18,500	7,620	18,200	1,120	266
20	3,330	1,950	2,170	844	621	3,540	5,200	18,400	7,220	18,100	1,120	282
21	3,320	1,950	2,180	845	1,270	3,540	5,740	18,500	7,230	18,000	1,110	293
22	3,310	1,960	2,170	835	2,990	3,180	5,930	18,400	7,240	17,900	969	293
23	3,300	1,960	2,180	959	3,420	2,690	5,960	18,300	6,510	17,700	834	305
24	3,070	1,970	1,520	724	1,790	2,090	5,980	18,200	6,210	17,600	829	311
25	2,890	1,980	1,090	610	833	1,680	6,570	18,300	6,480	16,300	817	325
26	2,880	1,890	838	620	1,050	1,690	7,300	18,200	9,840	14,600	814	402
27	2,890	1,660	630	625	1,280	1,700	7,470	18,200	14,200	13,000	692	317
28	2,640	1,580	626	614	1,440	1,640	7,290	18,100	16,400	11,400	493	321
29	2,440	1,570	629	612	---	1,660	6,640	18,200	18,000	9,160	407	340
30	2,160	1,760	859	618	---	1,680	7,730	18,200	17,900	4,860	406	338
31	1,930	---	1,050	603	---	1,700	---	18,100	---	3,680	406	---
TOTAL	112,272	68,400	67,872	28,851	26,222	65,394	132,890	539,100	390,840	499,000	48,857	10,538
MEAN	3,622	2,280	2,189	931	936	2,109	4,430	17,390	13,030	16,100	1,576	351
MAX	7,650	3,520	3,550	1,320	3,420	6,310	7,730	18,500	18,100	18,200	3,800	647
MIN	378	1,570	626	603	579	829	1,870	11,900	6,210	3,680	406	263
AC-FT	222,700	135,700	134,600	57,230	52,010	129,700	263,600	1,069,000	775,200	989,800	96,910	20,900
CFSM	0.29	0.18	0.18	0.08	0.08	0.17	0.36	1.41	1.06	1.31	0.13	0.03
IN.	0.34	0.21	0.20	0.09	0.08	0.20	0.40	1.63	1.18	1.51	0.15	0.03

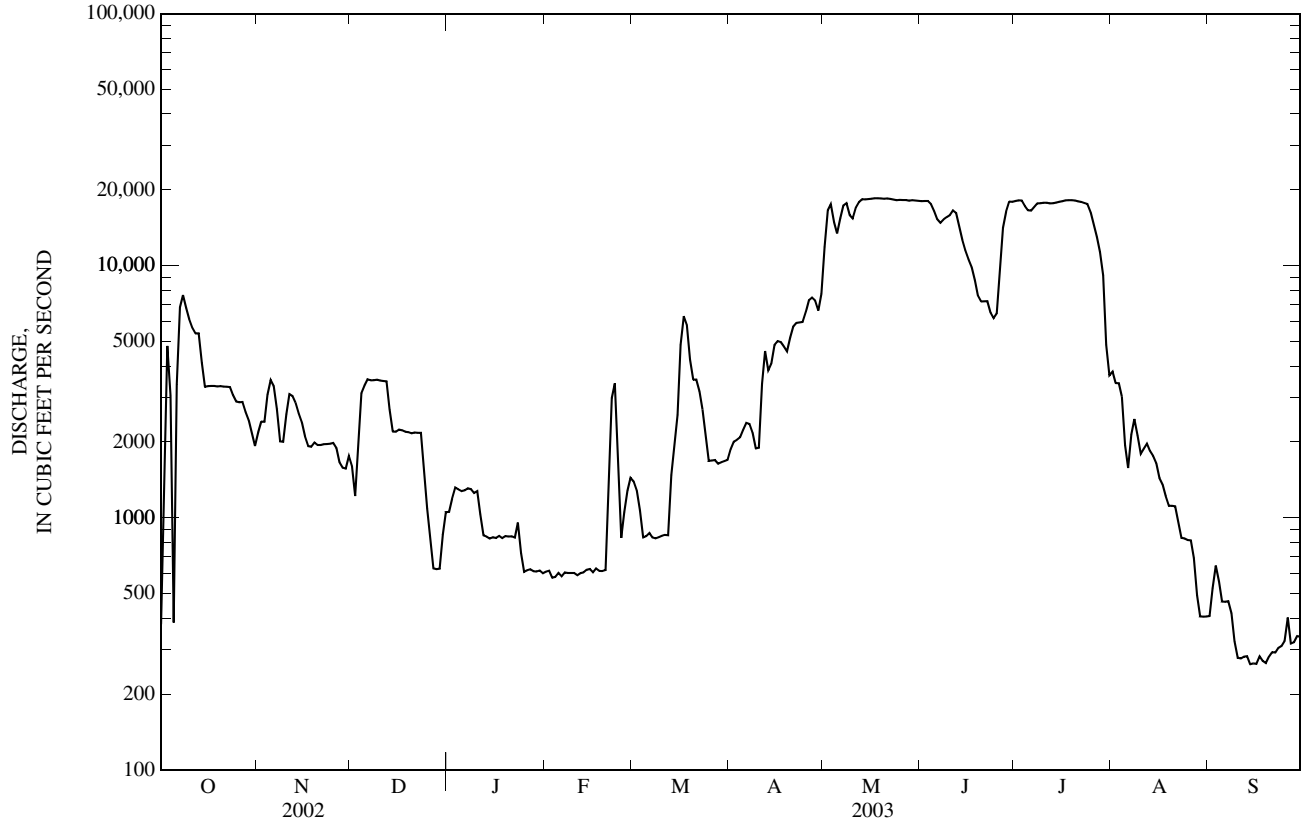
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2003, BY WATER YEAR (WY)

MEAN	2,993	3,356	3,702	1,786	3,585	8,238	11,940	14,250	15,650	19,740	8,514	4,117
MAX	11,150	11,990	12,380	3,997	8,246	17,480	22,040	28,520	27,950	79,340	44,600	33,490
(WY)	(1994)	(1993)	(1993)	(1993)	(1997)	(1993)	(1998)	(1993)	(1993)	(1993)	(1993)	(1993)
MIN	285	327	654	642	824	930	916	1,105	5,516	2,323	1,498	351
(WY)	(2001)	(2000)	(2000)	(2000)	(2000)	(2000)	(2000)	(2000)	(2000)	(2002)	(2000)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1993 - 2003	
ANNUAL TOTAL	1,230,773		1,990,236			
ANNUAL MEAN	3,372		5,453		8,185	
HIGHEST ANNUAL MEAN					24,360	1993
LOWEST ANNUAL MEAN					1,731	2000
HIGHEST DAILY MEAN	16,500	May 19	18,500	May 16a	104,000	Jul 12, 1993
LOWEST DAILY MEAN	327	Sep 22	263	Sep 14	248	Oct 15, 2000
ANNUAL SEVEN-DAY MINIMUM	363	Sep 21	271	Sep 14	254	Oct 9, 2000
MAXIMUM PEAK FLOW			18,900	May 19	105,000	Jul 12, 1993
MAXIMUM PEAK STAGE			93.44	May 19	109.71	Jul 12, 1993
ANNUAL RUNOFF (AC-FT)	2,441,000		3,948,000		5,930,000	
ANNUAL RUNOFF (CFSM)	0.27		0.44		0.66	
ANNUAL RUNOFF (INCHES)	3.71		6.00		9.02	
10 PERCENT EXCEEDS	7,380		17,800		21,200	
50 PERCENT EXCEEDS	2,250		2,200		3,770	
90 PERCENT EXCEEDS	814		582		620	

05488110 DES MOINES RIVER NEAR PELLA, IA—Continued

a Also May 17-19, 21.
e Estimated



05488200 ENGLISH CREEK NEAR KNOXVILLE, IA

LOCATION.--Lat 41°18'02", long 93°02'43", in NE¼ SE¼ sec.16, T.75 N., R.19 W., Marion County, Hydrologic Unit 07100009, on left bank 30 ft from left upstream abutment of bridge on State Highway 92, 3 mi east of Knoxville, and 11.4 mi upstream from mouth at Des Moines River.

DRAINAGE AREA.--90.1 mi^2.

PERIOD OF RECORD.--July 1985 to current year.

REVISED RECORDS.--WDR IA-97:(M)

GAGE.--Water-stage recorder. Datum of gage is 721.79 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 16, 1982 reached a stage of 30.28 ft, gage datum, discharge 28,000 ft^3/s, from contracted-opening indirect computations.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.49	2.7	1.6	1.6	e0.98	e5.1	11	83	11	25	0.79	1.4
2	13	2.4	1.5	1.3	e1.2	e2.3	11	51	9.9	21	0.73	0.89
3	27	2.2	1.2	1.1	e1.6	e2.3	10	41	11	17	0.51	0.72
4	8.0	2.1	1.3	1.1	e1.1	e2.3	11	398	12	14	0.43	0.60
5	4.3	2.1	1.3	1.1	0.93	e1.8	11	1,190	11	12	0.48	0.53
6	2.5	2.1	1.2	1.1	0.74	e1.6	12	198	13	11	0.50	0.53
7	1.1	2.1	1.3	1.3	e0.64	e2.8	14	103	23	9.6	0.43	0.52
8	0.72	1.8	1.1	1.7	0.58	e2.1	19	76	16	9.4	0.44	0.50
9	0.62	1.9	0.90	1.5	e0.55	e1.6	21	175	14	9.5	0.40	0.47
10	0.54	1.8	0.93	1.3	0.53	e2.2	21	282	96	10	0.35	0.44
11	0.73	1.6	1.2	1.0	0.67	e7.0	22	637	60	7.2	0.65	1.7
12	0.82	1.5	1.5	0.82	0.60	e26	19	121	25	5.1	0.56	15
13	0.65	1.8	1.8	0.85	0.59	e67	17	72	18	4.1	0.56	22
14	0.67	1.8	1.8	0.80	0.93	e99	16	61	14	3.7	0.63	33
15	0.68	1.8	1.7	0.65	e1.0	e117	16	96	12	3.7	0.63	13
16	0.87	1.6	1.6	0.69	e0.80	e84	17	62	9.8	3.4	0.69	3.8
17	1.4	1.6	1.7	0.77	e0.88	e49	16	43	8.3	3.2	0.79	1.5
18	1.6	1.8	2.0	e0.78	e2.1	32	17	35	7.5	2.6	0.96	0.52
19	1.5	1.6	2.4	e0.69	e4.5	27	20	32	7.2	2.2	0.76	0.81
20	1.2	1.6	2.7	e0.69	e54	26	89	31	6.6	1.9	1.1	0.74
21	1.2	1.9	2.4	e0.68	e123	22	83	27	5.5	1.8	1.0	0.92
22	1.3	1.9	2.0	e0.67	e156	18	48	24	5.1	2.0	1.0	1.7
23	1.2	1.9	1.5	e0.49	e93	16	37	22	5.1	2.1	1.1	0.87
24	1.8	1.7	1.2	0.28	e54	15	42	21	5.0	1.9	1.7	0.99
25	3.3	1.6	1.1	0.31	e32	14	e81	19	450	1.5	1.5	0.90
26	3.5	1.5	0.97	0.36	e15	13	e71	18	2,220	0.97	1.6	0.50
27	3.4	1.4	0.94	0.34	e15	13	e42	16	446	0.78	1.1	0.36
28	2.3	1.4	1.1	0.41	e12	13	e30	15	72	0.88	2.0	0.25
29	2.6	1.5	1.3	0.48	---	13	25	14	46	0.88	1.3	0.21
30	3.2	1.3	1.9	e0.73	---	12	106	13	31	0.82	0.87	0.22
31	2.9	---	1.7	e0.84	---	11	---	12	---	0.68	0.93	---
TOTAL	95.09	54.0	46.84	26.43	574.92	718.1	955	3,988	3,671.0	189.91	26.49	105.59
MEAN	3.07	1.80	1.51	0.85	20.5	23.2	31.8	129	122	6.13	0.85	3.52
MAX	27	2.7	2.7	1.7	156	117	106	1,190	2,220	25	2.0	33
MIN	0.49	1.3	0.90	0.28	0.53	1.6	10	12	5.0	0.68	0.35	0.21
AC-FT	189	107	93	52	1,140	1,420	1,890	7,910	7,280	377	53	209
CFSM	0.03	0.02	0.02	0.01	0.23	0.26	0.35	1.43	1.36	0.07	0.01	0.04
IN.	0.04	0.02	0.02	0.01	0.24	0.30	0.39	1.65	1.52	0.08	0.01	0.04

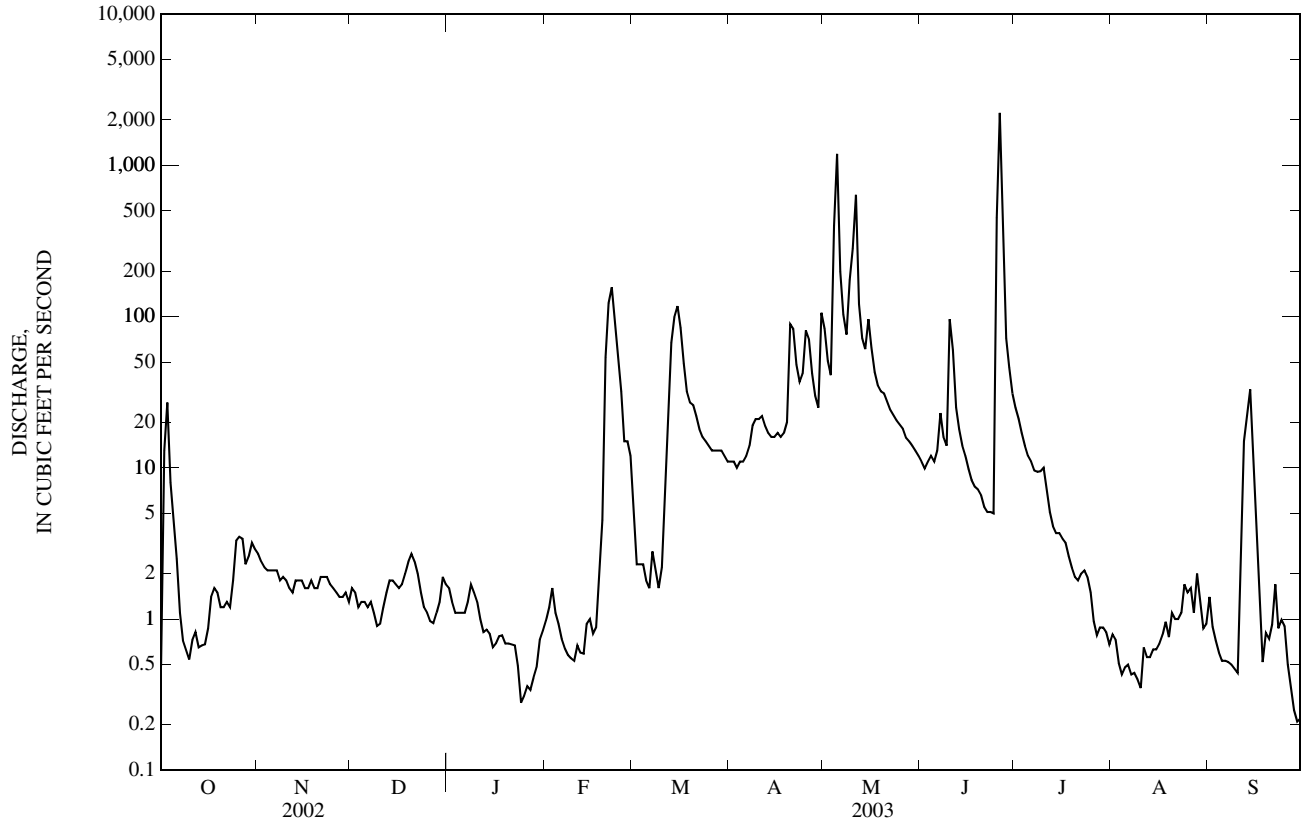
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 2003, BY WATER YEAR (WY)

MEAN	23.5	21.0	21.5	13.3	46.9	97.8	112	138	100	85.6	27.9	31.4
MAX	161	100	112	51.8	183	335	476	514	260	1,039	285	159
(WY)	(1987)	(1993)	(1993)	(1998)	(2001)	(1993)	(1991)	(1996)	(2000)	(1993)	(1993)	(1992)
MIN	0.48	0.76	0.31	0.66	0.50	2.05	1.03	1.99	2.27	0.18	0.17	0.026
(WY)	(1995)	(1989)	(1989)	(1989)	(1989)	(1989)	(1989)	(2000)	(1992)	(1988)	(1988)	(1991)

05488200 ENGLISH CREEK NEAR KNOXVILLE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1985 - 2003	
ANNUAL TOTAL	11,572.16		10,451.37			
ANNUAL MEAN	31.7		28.6		60.5	
HIGHEST ANNUAL MEAN					214	1993
LOWEST ANNUAL MEAN					6.71	1989
HIGHEST DAILY MEAN	1,590	Jul 11	2,220	Jun 26	8,610	Jul 5, 1993
LOWEST DAILY MEAN	0.24	Sep 12	0.21	Sep 29	0.00	Sep 12, 1988a
ANNUAL SEVEN-DAY MINIMUM	0.33	Sep 10	0.38	Jan 23	0.00	Sep 25, 1991
MAXIMUM PEAK FLOW			2,740	Jun 26	18,900	Jul 5, 1993
MAXIMUM PEAK STAGE			21.65	Jun 26	27.88	Jul 5, 1993
INSTANTANEOUS LOW FLOW			0.18	Sep 29		
ANNUAL RUNOFF (AC-FT)	22,950		20,730		43,850	
ANNUAL RUNOFF (CFSM)	0.35		0.32		0.67	
ANNUAL RUNOFF (INCHES)	4.78		4.32		9.13	
10 PERCENT EXCEEDS	45		48		100	
50 PERCENT EXCEEDS	3.9		1.9		8.7	
90 PERCENT EXCEEDS	1.1		0.60		0.44	

a Also Aug. 8-13, Sept. 13-17, 1989; Sept. 6-10, 21, and Sept. 25 to Oct. 3, 1991.
e Estimated.



05488500 DES MOINES RIVER NEAR TRACY, IA

LOCATION.--Lat 41°16'53", long 92°51'34", in NW¼ SE¼ sec.19, T.75 N., R.17 W., Mahaska County, Hydrologic Unit 07100009, on right bank 250 ft upstream from abandoned Bellefountaine Bridge, 0.8 mi east of Tracy, 3.1 mi upstream from Cedar Creek, 3.8 mi downstream from bridge on newly located State Highway 92, 6.4 mi downstream from English Creek, and at mile 130.4.

DRAINAGE AREA.--12,479 mi^2.

PERIOD OF RECORD.--March 1920 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1920 (M), 1922 (M), 1933.

GAGE.--Water-stage recorder. Datum of gage is 670.91 ft above NGVD of 1929. Prior to June 26, 1940 and June 30, 1952 to Nov. 4, 1960 nonrecording gage, and June 27, 1940 to June 29, 1952 water-stage recorder, at site 250 ft downstream at same datum.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Lake Red Rock (station 05488100) 11.9 mi upstream, since March 12, 1969. U.S. Army Corps of Engineers gage-height telemeter and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 155,000 ft^3/s, June 14, 1947, gage height, 26.5 ft; minimum daily discharge, 40 ft^3/s Jan. 29 to Feb. 2, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1851, that of June 14, 1947. Flood of May 31, 1903, reached a stage of about 25 ft, discharge, about 130,000 ft^3/s. Minimum daily discharge since at least 1910, that of Jan. 29 to Feb. 1, 1940.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	584	2,230	1,840	1,130	e729	1,490	1,820	11,200	19,700	18,500	3,560	486
2	1,130	2,540	1,420	1,200	733	1,370	2,040	17,300	19,700	18,700	3,190	518
3	4,400	2,540	1,740	e1,380	730	1,250	2,050	18,500	19,700	18,700	3,180	696
4	4,190	2,950	3,100	1,370	e735	e948	2,150	16,600	19,300	18,000	2,950	667
5	714	3,550	3,250	1,370	e736	e948	2,250	15,900	18,100	17,100	2,140	550
6	2,440	3,470	3,490	1,360	e732	950	2,400	16,400	16,900	17,100	1,460	543
7	6,430	2,930	3,500	e1,410	e739	940	2,430	18,600	16,100	17,500	1,860	543
8	7,730	2,280	3,490	1,390	e733	933	2,350	19,100	16,400	18,300	2,290	527
9	7,010	2,020	3,490	1,390	e726	e938	1,980	18,300	16,900	18,400	2,120	438
10	6,190	2,570	3,480	e1,390	714	933	1,970	16,700	17,200	18,500	1,750	349
11	5,720	3,110	3,450	e1,150	707	941	2,900	19,000	18,100	18,600	1,760	347
12	5,410	3,190	3,440	e947	698	1,010	4,450	19,400	17,700	18,600	1,860	465
13	5,400	2,960	2,950	933	703	1,480	3,980	19,900	16,000	18,800	1,800	484
14	4,530	2,790	2,240	e911	706	2,090	3,810	19,900	13,700	18,600	1,700	490
15	3,480	2,510	2,230	e929	e712	2,490	4,610	20,000	12,100	18,300	1,640	417
16	3,460	2,320	2,230	e922	e712	4,260	4,850	20,100	10,900	18,500	1,470	384
17	3,450	2,020	2,220	e934	724	5,970	4,850	20,100	9,830	18,600	1,340	371
18	3,440	2,010	2,220	e923	711	5,810	4,700	20,100	8,700	18,600	1,260	375
19	3,440	2,080	2,210	e936	703	4,440	4,520	20,100	7,370	18,600	1,130	371
20	3,440	2,050	2,200	e931	717	3,590	4,950	20,000	6,790	18,500	1,120	364
21	3,420	2,050	2,200	e931	1,240	3,580	5,590	20,000	6,780	18,400	1,120	377
22	3,420	2,050	2,200	e923	2,830	3,340	5,760	19,900	6,770	18,300	1,060	372
23	3,420	2,050	2,200	e1,060	3,520	2,840	5,760	19,900	6,300	18,200	915	364
24	3,280	2,050	1,840	e834	2,360	2,360	5,770	19,800	5,510	18,100	907	363
25	3,050	2,050	e1,390	e722	e941	1,790	6,220	19,800	6,600	17,000	915	354
26	3,030	2,010	e1,070	e736	1,050	1,780	7,080	19,800	10,300	15,200	920	403
27	3,020	1,790	770	e745	1,340	1,780	7,300	19,800	15,100	13,600	865	366
28	2,850	1,680	744	e732	1,430	1,780	7,140	19,700	16,200	11,800	667	327
29	2,590	1,680	741	e728	---	1,770	6,560	19,800	18,400	9,760	496	326
30	2,410	1,810	846	e734	---	1,770	7,100	19,800	18,400	5,380	486	328
31	2,080	---	1,110	e721	---	1,770	---	19,700	---	3,310	496	---
TOTAL	115,158	71,340	69,301	31,772	29,111	67,341	129,340	585,200	411,550	515,550	48,427	12,965
MEAN	3,715	2,378	2,236	1,025	1,040	2,172	4,311	18,880	13,720	16,630	1,562	432
MAX	7,730	3,550	3,500	1,410	3,520	5,970	7,300	20,100	19,700	18,800	3,560	696
MIN	584	1,680	741	721	698	933	1,820	11,200	5,510	3,310	486	326
AC-FT	228,400	141,500	137,500	63,020	57,740	133,600	256,500	1,161,000	816,300	1,023,000	96,050	25,720
CFSM	0.30	0.19	0.18	0.08	0.08	0.17	0.35	1.51	1.10	1.33	0.13	0.03
IN.	0.34	0.21	0.21	0.09	0.09	0.20	0.39	1.74	1.23	1.54	0.14	0.04

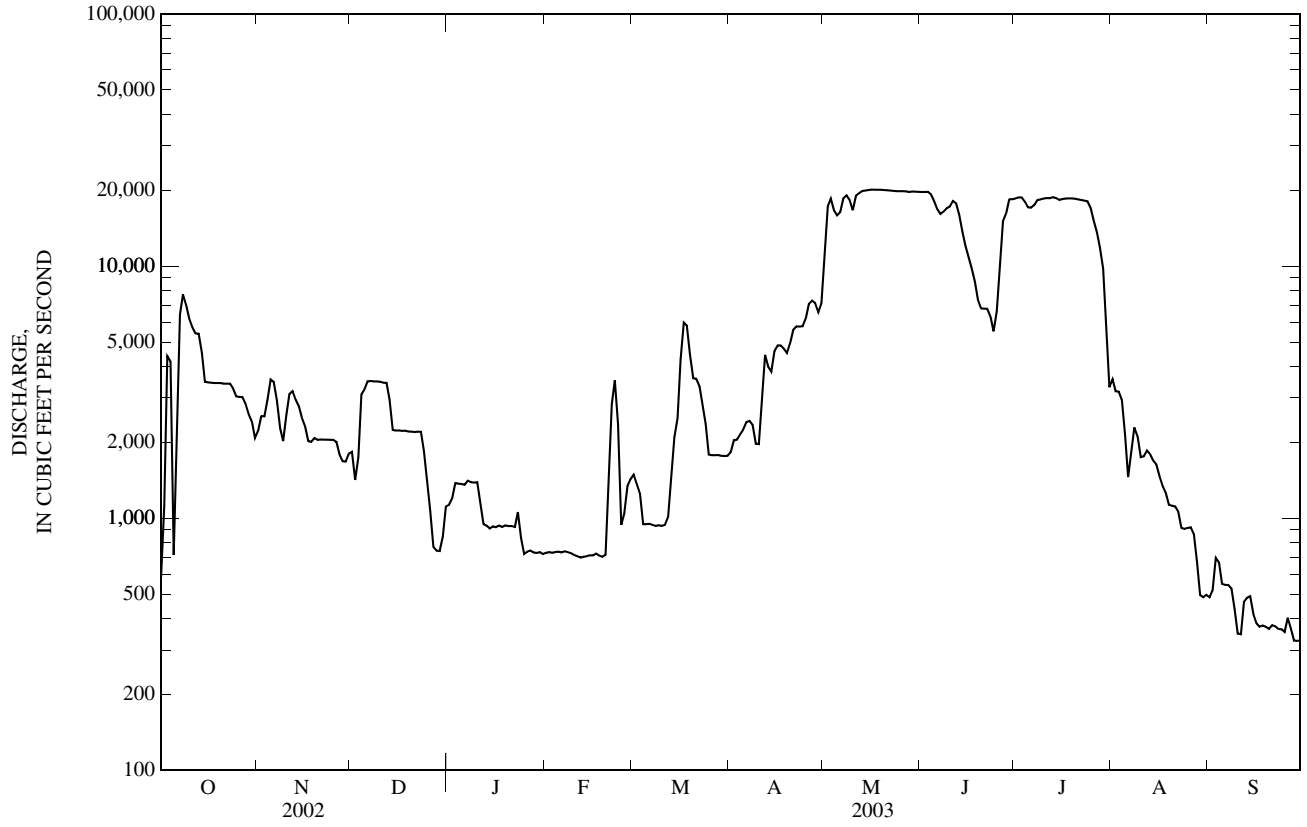
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2003, BY WATER YEAR (WY)

MEAN	3,452	4,356	3,746	2,448	4,207	8,954	11,620	12,190	13,300	13,780	7,621	4,001
MAX	17,190	19,160	12,540	11,510	15,560	21,520	24,370	28,280	30,260	80,800	45,240	33,670
(WY)	(1974)	(1987)	(1983)	(1973)	(1973)	(1983)	(1998)	(1993)	(1984)	(1993)	(1993)	(1993)
MIN	318	340	344	305	276	746	866	425	277	220	591	342
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1989)	(1976)

05488500 DES MOINES RIVER NEAR TRACY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1970 - 2003a	
ANNUAL TOTAL	1,290,674		2,087,055			
ANNUAL MEAN	3,536		5,718		7,488	
HIGHEST ANNUAL MEAN					24,450	1993
LOWEST ANNUAL MEAN					898	1977
HIGHEST DAILY MEAN	17,000	May 19	20,100	May 16b	107,000	Jul 12, 1993
LOWEST DAILY MEAN	541	Sep 17	326	Sep 29	165	Feb 20, 1977
ANNUAL SEVEN-DAY MINIMUM	567	Sep 22	352	Sep 24	210	Oct 9, 1980
MAXIMUM PEAK FLOW			20,200	May 9	109,000	Jul 12, 1993
MAXIMUM PEAK STAGE			9.62	May 9	24.16	Jul 12, 1993
ANNUAL RUNOFF (AC-FT)	2,560,000		4,140,000		5,425,000	
ANNUAL RUNOFF (CFSM)	0.28		0.46		0.60	
ANNUAL RUNOFF (INCHES)	3.85		6.22		8.15	
10 PERCENT EXCEEDS	7,670		18,500		19,200	
50 PERCENT EXCEEDS	2,430		2,290		3,770	
90 PERCENT EXCEEDS	932		701		551	

a Post regulation.
b Also May 17-19.
e Estimated.



05489000 CEDAR CREEK NEAR BUSSEY, IA

LOCATION.--Lat 41°13'09", long 92°54'38", at SW corner sec.11, T.74 N., R.18 W., Marion County, Hydrologic Unit 07100009, on left bank 10 ft downstream from bridge on State Highway 156, 0.8 mi downstream from North Cedar Creek, 1.6 mi northwest of Bussey, 3.0 mi upstream from Honey Creek, and 8.9 mi upstream from mouth.

DRAINAGE AREA.--374 mi^2.

PERIOD OF RECORD.--October 1947 to current year.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water stage recorder. Datum of gage is 682.15 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers). Prior to Feb. 21, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1946 reached a stage of 28.45 ft on upstream side and 28.05 ft on downstream side of bridge, levels to floodmarks by U.S. Army Corps of Engineers, discharge, 31,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	5.4	4.1	4.4	3.6	6.2	12	328	22	56	5.1	3.6
2	25	4.4	e3.8	e4.3	4.1	5.7	11	190	22	45	10	3.3
3	38	4.1	e3.6	e4.0	4.9	5.3	9.7	100	30	34	4.0	2.9
4	25	4.1	4.1	e3.9	4.2	5.2	9.4	983	41	30	3.4	2.4
5	8.9	4.2	4.2	e3.9	3.7	5.8	11	2,400	35	26	3.3	2.1
6	5.3	7.4	4.0	e3.9	e3.2	5.8	15	549	41	23	3.3	2.2
7	4.2	5.0	3.9	4.0	e2.8	5.7	21	261	71	23	3.0	2.1
8	3.6	5.3	3.8	5.0	2.6	5.9	48	194	63	25	3.2	1.9
9	3.1	5.5	3.3	e4.7	2.5	6.5	49	1,870	53	30	3.2	1.9
10	2.7	5.6	3.6	e4.2	2.5	7.0	36	563	187	34	3.2	1.7
11	2.4	5.3	3.9	e4.2	2.3	11	31	340	161	33	5.1	2.1
12	2.5	5.0	4.3	4.1	2.4	e47	23	174	70	27	12	30
13	2.2	4.4	e4.5	3.7	2.5	e122	17	123	43	18	5.6	39
14	2.3	4.4	e4.6	3.4	3.2	e193	12	105	100	14	4.3	63
15	2.8	4.5	4.5	2.9	3.8	e223	9.2	134	40	11	4.0	53
16	2.7	4.3	5.1	2.8	3.4	e202	8.7	96	25	9.1	3.7	24
17	2.7	4.6	5.4	2.8	3.4	e153	7.8	70	19	7.8	3.4	9.3
18	2.9	5.8	6.5	2.7	3.8	133	6.8	58	15	6.8	2.7	5.4
19	3.0	4.5	8.7	2.7	13	92	9.7	54	12	6.2	2.4	4.5
20	3.2	4.5	11	2.7	e46	78	80	57	9.4	5.9	2.5	3.6
21	3.0	4.6	7.5	2.6	e239	64	127	49	7.5	5.8	2.5	3.8
22	2.8	4.9	7.3	2.5	e297	47	62	40	6.6	5.4	2.4	4.3
23	3.0	4.4	5.5	2.2	e111	35	34	38	5.8	4.9	2.2	3.8
24	3.9	4.7	4.9	2.1	e39	30	29	35	5.5	4.6	2.3	4.0
25	8.2	4.8	4.2	2.0	e24	26	127	33	224	4.4	2.1	3.3
26	13	4.7	3.6	2.1	26	22	165	34	2,220	4.2	2.1	2.3
27	8.9	4.0	3.4	2.1	16	19	97	29	295	4.1	2.1	2.1
28	5.6	4.0	3.5	2.1	8.0	23	57	30	130	4.5	2.5	2.1
29	5.7	4.3	3.8	2.2	---	26	48	34	80	4.3	3.1	1.9
30	5.8	4.5	4.7	2.4	---	19	92	29	64	4.2	3.4	2.0
31	5.4	---	5.0	3.0	---	13	---	25	---	4.4	3.2	---
TOTAL	213.8	143.2	150.3	99.6	877.9	1,637.1	1,265.3	9,025	4,097.8	515.6	115.3	287.6
MEAN	6.90	4.77	4.85	3.21	31.4	52.8	42.2	291	137	16.6	3.72	9.59
MAX	38	7.4	11	5.0	297	223	165	2,400	2,220	56	12	63
MIN	2.2	4.0	3.3	2.0	2.3	5.2	6.8	25	5.5	4.1	2.1	1.7
AC-FT	424	284	298	198	1,740	3,250	2,510	17,900	8,130	1,020	229	570
CFSM	0.02	0.01	0.01	0.01	0.08	0.14	0.11	0.78	0.37	0.04	0.01	0.03
IN.	0.02	0.01	0.01	0.01	0.09	0.16	0.13	0.90	0.41	0.05	0.01	0.03

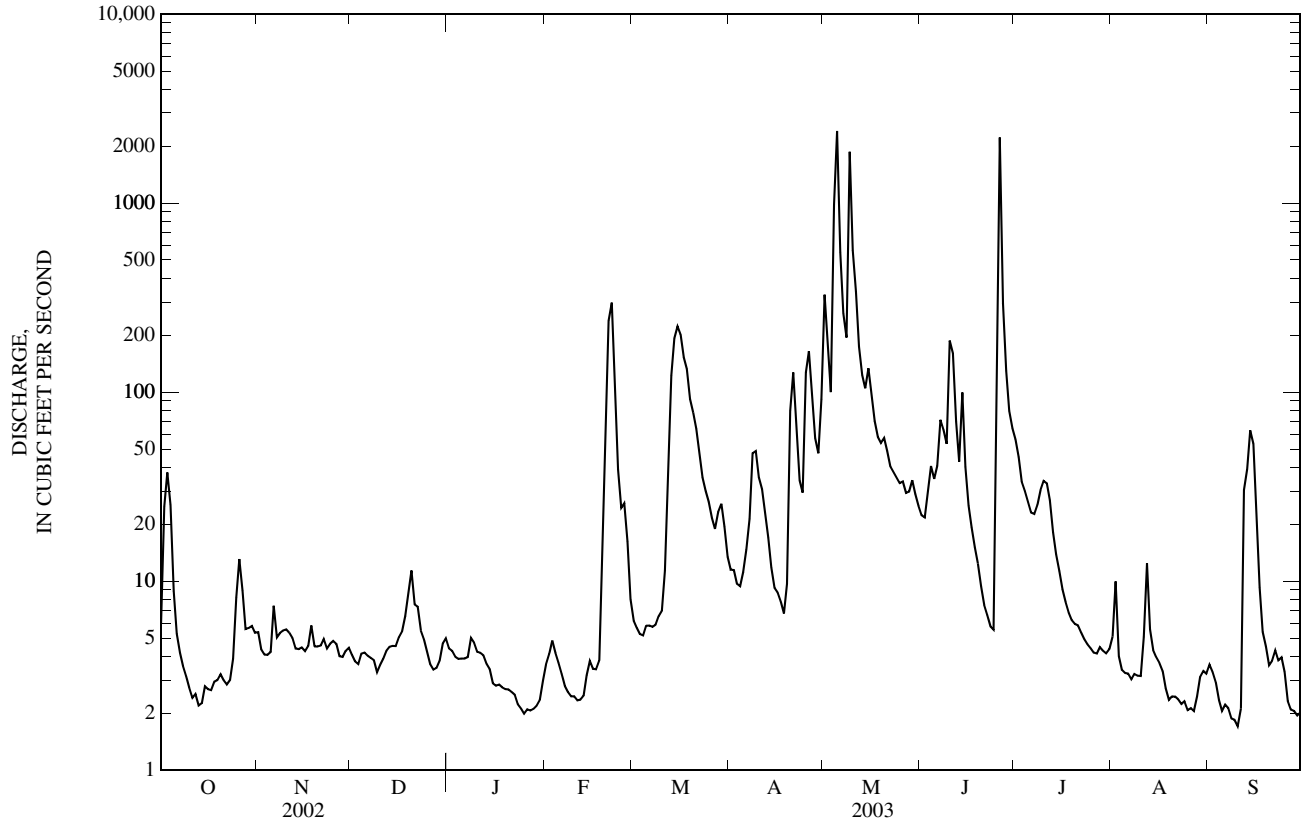
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2003, BY WATER YEAR (WY)

MEAN	110	125	87.3	83.0	225	405	410	426	315	275	104	147
MAX	950	1,331	844	894	952	1,371	1,552	1,797	1,258	3,846	1,070	1,384
(WY)	(1974)	(1962)	(1983)	(1974)	(1949)	(1960)	(1973)	(1996)	(1967)	(1982)	(1993)	(1992)
MIN	0.18	0.33	0.39	0.20	2.29	3.78	0.79	7.19	2.74	2.26	2.51	0.60
(WY)	(1957)	(1956)	(1956)	(1956)	(1954)	(1954)	(1956)	(1956)	(1977)	(1988)	(1953)	(1953)

05489000 CEDAR CREEK NEAR BUSSEY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1948 - 2003	
ANNUAL TOTAL	51,384.2		18,428.5			
ANNUAL MEAN	141		50.5		226	
HIGHEST ANNUAL MEAN					768	1993
LOWEST ANNUAL MEAN					29.4	1989
HIGHEST DAILY MEAN	6,630	May 12	2,400	May 5	42,000	Jul 3, 1982
LOWEST DAILY MEAN	2.2	Oct 13	1.7	Sep 10	0.00	Sep 6, 1955a
ANNUAL SEVEN-DAY MINIMUM	2.5	Oct 10	2.0	Sep 5	0.00	Sep 6, 1955
MAXIMUM PEAK FLOW			3,940	May 5	96,000	Jul 3, 1982
MAXIMUM PEAK STAGE			14.48	May 5	34.61	Jul 3, 1982
INSTANTANEOUS LOW FLOW			1.5	Sep 11		
ANNUAL RUNOFF (AC-FT)	101,900		36,550		163,500	
ANNUAL RUNOFF (CFSM)	0.38		0.13		0.60	
ANNUAL RUNOFF (INCHES)	5.11		1.83		8.20	
10 PERCENT EXCEEDS	236		94		400	
50 PERCENT EXCEEDS	20		5.4		36	
90 PERCENT EXCEEDS	4.0		2.5		2.7	

a Also Sept. 7-20, 1955, Oct. 11, 12, 1956, Aug. 12, 13, 1989.
e Estimated.



05489500 DES MOINES RIVER AT OTTUMWA, IA

LOCATION.--Lat 41°00'39", long 92°24'40", in SE¼ NE¼ sec.25, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, on right bank 15 ft downstream from Colorado and Eastern Railroad Bridge at Ottumwa, 0.4 mi downstream from Ottumwa powerplant, 6.5 mi upstream from Village Creek, 9.5 mi downstream from South Avery Creek, and at mile 94.1.

DRAINAGE AREA.--13,374 mi^2.

PERIOD OF RECORD.--March 1917 to current year (published as "at Eldon" October 1930 to March 1935). Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1917-20. WSP 1308: 1917-23 (M), 1925-27 (M), 1931. WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 622.00 ft above NGVD of 1929. Prior to Sept. 30, 1930, nonrecording gage at Market Street Bridge 1,700 ft upstream at datum 0.83 ft higher. Oct. 1, 1930 to Mar. 31, 1935, nonrecording gage at Eldon 15 mi downstream at different datum. Apr. 1, 1935 to Oct. 25, 1963, water-stage recorder at site 1,100 ft downstream at Vine Street Bridge at datum 0.77 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Prior to Dec. 12, 1958 and since Nov. 30, 1960, diurnal fluctuation at low and medium stages are caused by powerplant upstream of station about ½ mile. Flow regulated by Lake Red Rock (station 05488100) 48.2 mi upstream since March 12, 1969. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 135,000 ft^3/s June 7, 1947, gage height, 20.2 ft, site and datum then in use; minimum daily discharge, 26 ft^3/s Oct. 25, 1990, when gates at dam in Ottumwa were closed.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1850, that of June 7, 1947. Flood of May 31, 1903, reached a stage of 19.4 ft, former site and datum at Vine Street Bridge or about 22 ft at Market Street Bridge, from information by U.S. Army Corps of Engineers and U.S. National Weather Service, discharge, about 140,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	489	2,090	1,910	864	658	1,730	2,050	10,100	19,100	17,500	3,800	612
2	529	2,130	1,630	1,010	683	1,820	1,930	15,200	19,000	17,700	3,590	617
3	1,720	2,430	1,360	917	833	1,580	2,060	17,900	18,900	17,800	3,410	524
4	5,640	2,430	2,090	1,310	1,210	1,410	2,100	18,200	18,800	17,600	3,410	719
5	2,890	3,220	3,090	1,340	747	671	2,210	18,100	17,900	16,400	2,980	625
6	701	3,480	3,260	1,100	917	1,280	2,270	16,600	16,700	16,300	2,010	589
7	2,150	3,230	3,510	1,090	1,110	1,440	2,490	18,100	15,600	16,200	1,930	664
8	6,840	2,640	3,400	1,340	815	1,250	2,410	18,700	15,400	17,300	2,150	431
9	7,000	2,000	3,390	1,090	917	1,520	2,330	20,900	16,100	17,600	2,600	512
10	6,010	2,270	3,410	1,040	743	1,430	2,110	17,700	16,200	17,700	2,410	461
11	5,700	2,660	3,370	541	836	1,230	2,130	18,400	17,100	17,800	2,070	457
12	5,130	3,160	3,450	821	1,140	1,300	3,810	19,300	17,000	17,700	2,140	726
13	4,970	3,060	3,440	699	605	1,920	4,490	19,700	16,200	17,900	2,140	381
14	5,050	2,900	2,510	742	863	2,840	3,630	19,800	14,200	17,900	1,990	848
15	3,510	2,600	2,240	733	823	2,740	4,460	19,800	12,200	17,500	1,940	558
16	3,220	2,500	2,110	540	962	3,500	4,930	19,900	11,000	17,600	1,790	433
17	3,260	2,210	2,300	1,310	1,060	5,740	4,980	20,000	9,990	17,700	1,620	623
18	3,040	2,060	2,220	1,100	879	6,340	5,110	20,000	9,240	17,800	1,510	532
19	3,100	2,070	2,180	1,130	914	5,440	4,890	20,000	7,850	17,800	1,420	315
20	3,260	2,020	2,220	897	934	4,090	5,040	19,900	6,850	17,800	1,330	473
21	3,140	2,120	2,130	1,020	1,490	3,540	5,880	19,900	6,770	17,700	1,280	355
22	3,210	2,140	2,150	1,260	2,910	3,700	6,220	19,800	6,680	17,600	1,200	404
23	3,230	2,020	2,090	e1,250	4,330	3,110	6,250	19,500	6,650	17,500	1,120	441
24	3,230	2,080	2,030	1,080	4,450	2,780	6,280	19,500	5,470	17,400	1,100	461
25	3,000	2,070	1,710	1,200	1,790	2,340	6,570	19,500	6,520	17,300	1,040	315
26	2,970	2,100	863	978	1,300	1,910	7,530	19,500	13,100	15,400	1,030	512
27	2,850	2,220	900	1,120	1,690	1,870	8,000	19,400	15,200	13,900	947	406
28	2,860	1,840	873	800	1,810	1,910	7,910	19,400	14,500	12,300	863	515
29	2,620	1,770	805	788	---	1,790	7,680	19,200	17,300	10,500	796	401
30	2,520	1,600	792	785	---	1,800	7,030	19,200	17,500	7,570	518	291
31	2,410	---	780	1,000	---	1,880	---	19,100	---	3,780	618	---
TOTAL	106,249	71,120	68,213	30,895	37,419	75,901	134,780	582,300	405,020	500,550	56,752	15,201
MEAN	3,427	2,371	2,200	997	1,336	2,448	4,493	18,780	13,500	16,150	1,831	507
MAX	7,000	3,480	3,510	1,340	4,450	6,340	8,000	20,900	19,100	17,900	3,800	848
MIN	489	1,600	780	540	605	671	1,930	10,100	5,470	3,780	518	291
AC-FT	210,700	141,100	135,300	61,280	74,220	150,500	267,300	1,155,000	803,400	992,800	112,600	30,150
CFSM	0.26	0.18	0.16	0.07	0.10	0.18	0.34	1.40	1.01	1.21	0.14	0.04
IN.	0.30	0.20	0.19	0.09	0.10	0.21	0.37	1.62	1.13	1.39	0.16	0.04

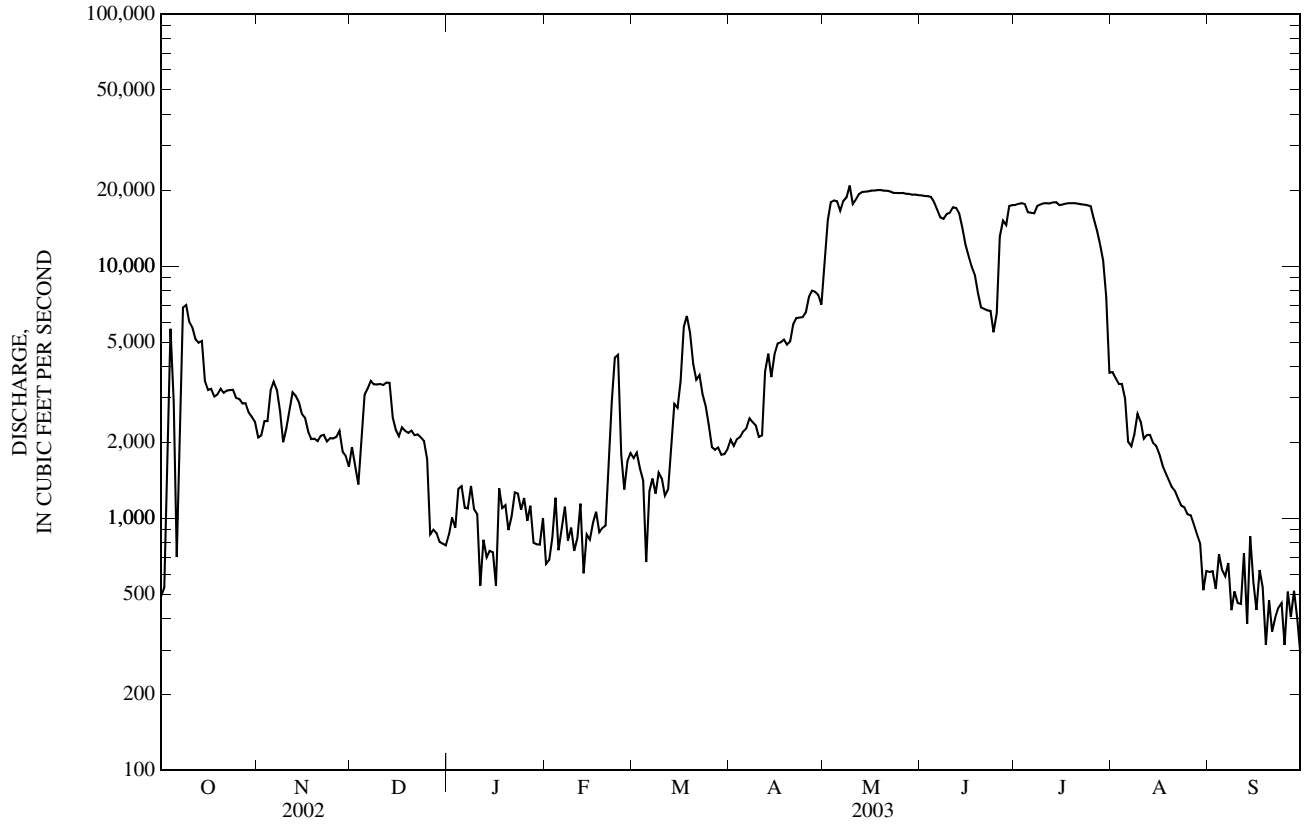
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2003, BY WATER YEAR (WY)

MEAN	3,817	4,726	4,152	2,773	4,626	9,756	12,420	13,190	14,030	14,490	8,010	4,379
MAX	18,390	19,250	13,980	12,380	16,470	21,750	25,330	29,770	31,980	85,570	47,380	34,790
(WY)	(1974)	(1987)	(1993)	(1973)	(1973)	(1983)	(1983)	(1993)	(1984)	(1993)	(1993)	(1993)
MIN	307	327	381	290	328	891	962	519	282	238	610	366
(WY)	(2001)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1988)	(1976)

05489500 DES MOINES RIVER AT OTTUMWA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1970 - 2003a	
ANNUAL TOTAL	1,419,686		2,084,400			
ANNUAL MEAN	3,890		5,711		8,047	
HIGHEST ANNUAL MEAN					26,350	1993
LOWEST ANNUAL MEAN					1,120	1977
HIGHEST DAILY MEAN	18,700	May 17	20,900	May 9	110,000	Jul 12, 1993
LOWEST DAILY MEAN	319	Sep 15	291	Sep 30	26	Oct 25, 1990b
ANNUAL SEVEN-DAY MINIMUM	434	Sep 23	395	Sep 19	182	Jul 7, 1977
MAXIMUM PEAK FLOW			22,400	May 9	112,000	Jul 12, 1993
MAXIMUM PEAK STAGE			8.05	May 9	22.15	Jul 12, 1993
ANNUAL RUNOFF (AC-FT)	2,816,000		4,134,000		5,830,000	
ANNUAL RUNOFF (CFSM)	0.29		0.43		0.60	
ANNUAL RUNOFF (INCHES)	3.95		5.80		8.18	
10 PERCENT EXCEEDS	9,190		17,800		20,200	
50 PERCENT EXCEEDS	2,430		2,340		4,210	
90 PERCENT EXCEEDS	963		678		639	

a Post regulation.
b Gates at dam in Ottumwa closed.
e Estimated.



05490500 DES MOINES RIVER AT KEOSAUQUA, IA

LOCATION.--Lat 40°43'40", long 91°57'34", in SE$^1/_4$ SW$^1/_4$ sec.36, T.69 N., R.10 W., Van Buren County, Hydrologic Unit 07100009, on right bank 10 ft upstream from bridge on State Highway 1 at Keosauqua, 4.0 mi downstream from Chequest Creek, and at mile 51.3.

DRAINAGE AREA.--14,038 mi^2.

PERIOD OF RECORD.--May 1903 to July 1906, April to December 1910, August 1911 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1913-20. WSP 1438: Drainage area. WSP 1508: 1903, 1905-6, 1915- 18 (M), 1922 (M), 1924-26 (M), 1932-34 (M), 1937, 1942 (M).

GAGE.--Water-stage recorder. Datum of gage is 547.36 ft above NGVD of 1929. Prior to Dec. 24, 1933, nonrecording gage, and Dec. 25, 1933, to Sept. 30, 1972, water-stage recorder, at same site at datum 10.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Prior to Dec. 21, 1958, and since Nov. 30, 1960, some diurnal fluctuation at medium and low stages caused by power plant at Ottumwa. Flow regulated by Lake Red Rock (station 05488100) 91.0 mi upstream, since March 12, 1969. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 146,000 ft^3/s June 1, 1903, gage height, 27.85 ft, from floodmark, datum then in use; minimum daily discharge, 40 ft^3/s Jan. 30, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1851, reached a stage of 24 ft, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	406	2,440	1,640	877	1,210	2,260	1,980	8,940	19,200	17,600	4,050	722
2	547	2,160	1,930	951	1,160	2,180	1,860	12,700	19,100	17,700	4,400	674
3	613	2,270	1,650	1,190	1,280	2,120	1,970	16,600	19,100	17,900	3,980	565
4	2,410	2,540	1,350	1,170	1,010	1,850	2,250	17,900	19,100	17,900	3,790	546
5	6,150	2,620	2,380	1,540	1,070	1,740	2,240	18,500	18,600	17,400	3,700	638
6	2,390	3,640	3,340	1,530	815	933	2,340	17,900	17,600	16,600	3,070	666
7	855	3,690	3,670	1,270	1,140	1,100	2,590	17,000	16,400	16,400	2,030	774
8	3,530	3,260	3,610	1,300	787	1,950	2,720	18,400	15,700	17,600	1,950	518
9	7,400	2,720	3,660	e1,380	963	1,890	2,630	20,700	15,900	18,600	2,280	552
10	6,910	2,010	3,680	e1,160	1,010	1,370	2,450	20,200	16,500	19,100	2,590	506
11	6,160	2,400	3,660	e802	1,080	1,440	2,230	19,400	16,900	18,200	2,270	516
12	5,840	2,930	3,520	e962	1,090	1,670	2,320	19,700	17,400	18,000	2,070	524
13	5,380	3,380	3,620	e854	944	2,670	4,640	19,600	16,900	18,000	2,010	829
14	5,370	3,160	3,580	e886	1,130	3,210	4,700	19,900	15,500	18,000	2,090	972
15	5,010	3,030	2,400	e840	1,220	3,780	4,010	20,000	13,700	17,800	1,880	954
16	3,590	2,610	2,310	e931	1,120	4,020	5,050	20,000	12,200	17,700	1,840	713
17	3,440	2,560	2,180	e1,090	1,120	4,680	5,510	20,100	11,200	17,700	1,730	572
18	3,340	2,210	2,510	e1,120	1,260	6,450	5,480	20,200	10,400	17,800	1,550	583
19	3,410	2,160	2,380	e1,090	1,360	6,480	5,630	20,300	9,500	17,800	1,420	641
20	3,420	2,110	2,220	e1,040	1,330	5,280	5,750	20,200	8,320	17,800	1,380	561
21	3,370	2,160	2,330	1,410	1,520	4,110	6,080	20,100	7,640	17,800	1,270	461
22	3,410	2,210	2,250	1,510	2,130	3,850	6,690	19,900	7,610	17,700	1,210	537
23	3,410	2,170	2,260	1,360	3,940	3,770	6,820	19,900	7,550	17,600	1,150	433
24	3,530	2,090	2,300	1,280	5,450	3,210	6,910	19,700	7,280	17,500	1,050	500
25	3,580	2,130	2,070	1,080	4,850	2,850	7,730	19,600	6,770	17,300	1,040	466
26	3,170	2,130	1,420	1,530	2,340	2,210	8,170	19,600	13,700	16,200	1,080	524
27	3,130	2,160	869	1,420	1,520	1,920	8,550	19,500	15,000	14,600	1,020	403
28	2,980	2,290	1,110	998	1,900	1,940	8,710	19,500	15,400	13,400	1,060	586
29	3,050	1,830	1,200	1,170	---	1,980	8,520	19,300	16,300	11,700	867	456
30	2,710	1,800	1,110	1,300	---	1,840	8,160	19,400	17,700	9,820	812	669
31	2,620	---	898	1,200	---	1,940	---	19,300	---	6,600	788	---
TOTAL	111,131	74,870	73,107	36,241	45,749	86,693	144,690	584,040	424,170	515,820	61,427	18,061
MEAN	3,585	2,496	2,358	1,169	1,634	2,797	4,823	18,840	14,140	16,640	1,982	602
MAX	7,400	3,690	3,680	1,540	5,450	6,480	8,710	20,700	19,200	19,100	4,400	972
MIN	406	1,800	869	802	787	933	1,860	8,940	6,770	6,600	788	403
AC-FT	220,400	148,500	145,000	71,880	90,740	172,000	287,000	1,158,000	841,300	1,023,000	121,800	35,820
CFSM	0.26	0.18	0.17	0.08	0.12	0.20	0.34	1.34	1.01	1.19	0.14	0.04
IN.	0.29	0.20	0.19	0.10	0.12	0.23	0.38	1.55	1.12	1.37	0.16	0.05

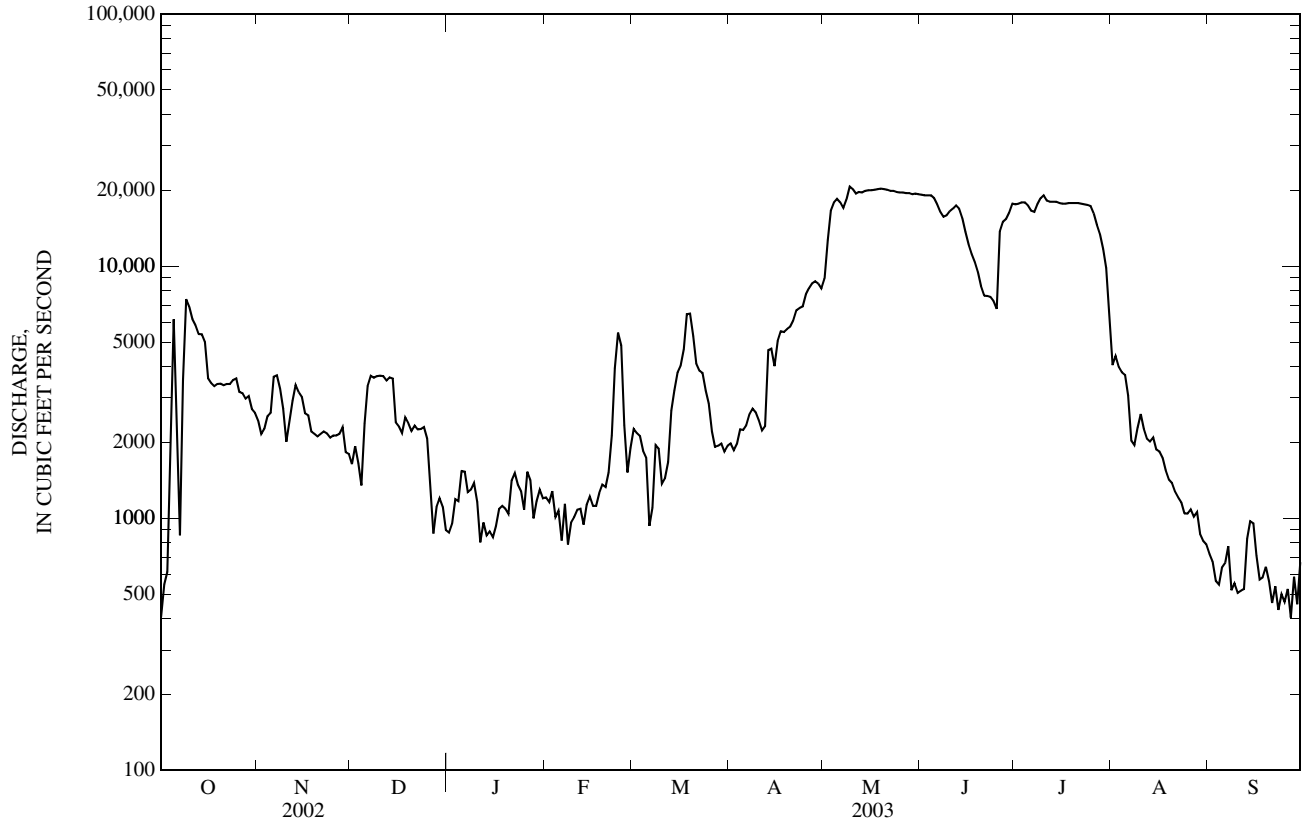
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2003, BY WATER YEAR (WY)

MEAN	4,035	4,873	4,366	2,940	4,933	10,230	13,050	13,970	14,420	14,980	8,250	4,753
MAX	19,850	19,320	14,510	13,120	17,370	22,200	30,030	31,260	30,900	86,150	47,320	35,210
(WY)	(1974)	(1987)	(1983)	(1973)	(1973)	(1983)	(1973)	(1993)	(1984)	(1993)	(1993)	(1993)
MIN	383	332	385	291	331	1,170	1,224	696	300	258	528	362
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1981)	(1977)	(1977)	(1977)	(1977)	(1989)	(1976)

05490500 DES MOINES RIVER AT KEOSAUQUA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1970 - 2003a	
ANNUAL TOTAL	1,574,490		2,175,999			
ANNUAL MEAN	4,314		5,962		8,417	
HIGHEST ANNUAL MEAN					26,920	1993
LOWEST ANNUAL MEAN					1,303	1977
HIGHEST DAILY MEAN	30,700	May 12	20,700	May 9	108,000	Jul 13, 1993
LOWEST DAILY MEAN	377	Sep 17	403	Sep 27	115	Oct 27, 1990b
ANNUAL SEVEN-DAY MINIMUM	428	Sep 25	475	Sep 21	204	Jul 3, 1977
MAXIMUM PEAK FLOW			22,700	May 10	111,000	Jul 12, 1993
MAXIMUM PEAK STAGE			16.74	May 10	32.66	Jul 13, 1993
ANNUAL RUNOFF (AC-FT)	3,123,000		4,316,000		6,098,000	
ANNUAL RUNOFF (CFSM)	0.31		0.42		0.60	
ANNUAL RUNOFF (INCHES)	4.17		5.77		8.15	
10 PERCENT EXCEEDS	10,000		17,900		21,100	
50 PERCENT EXCEEDS	2,710		2,510		4,570	
90 PERCENT EXCEEDS	1,110		836		700	

a Post regulation.
b Gates at dam in Ottumwa closed
e Estimated.



05494300 FOX RIVER AT BLOOMFIELD, IA

LOCATION.--Lat 40°46'10", long 92°25'05", in SW¼ SE¼ sec.13, T.69 N., R.14 W., Davis County, Hydrologic Unit 07110001, on left bank 15 ft. downstream from bridge on county road V20, 1.3 miles north of county courthouse at Bloomfield, and 8.6 miles downstream from North Fox Creek.

DRAINAGE AREA.-- 87.7 mi^2

PERIOD OF RECORD.--October 1957 to September 1973; May 1997 to current year.

GAGE.--Water-stage recorder. Datum of gage is 755.57 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 9, 1905 and June 18, 1946, exceeded all other known floods at this location, stage and discharge unknown. Also flood of May 6, 1960 reached a stage of 24.02 ft., gage datum; discharge 8,600 cfs (Slope-Area Measurement).

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.8	e1.6	e1.1	e0.77	e3.4	e6.0	e13	e34	6.2	3.1	e0.54	9.4
2	e5.4	e1.3	e0.95	e0.61	e3.8	e3.5	e12	e28	6.8	2.2	e0.52	3.0
3	e6.4	e1.2	e0.95	e0.63	e2.8	e3.0	e11	e47	7.4	1.9	e0.50	2.1
4	e7.2	e0.93	e0.95	e0.43	e1.7	e2.2	e11	e216	6.5	1.6	e0.48	1.3
5	e5.6	e0.82	e0.77	e0.34	e1.5	e1.3	e7.6	e311	5.9	1.5	e0.46	1.1
6	e4.8	e0.68	e0.50	e0.58	e1.7	e1.3	e5.0	e32	9.4	1.4	e0.45	0.78
7	e3.9	e0.84	e0.95	e1.2	e1.3	e6.0	e3.5	e12	11	1.4	0.43	0.67
8	e3.4	e1.1	e0.92	e2.2	e1.6	e5.0	e3.0	e32	9.2	2.0	0.37	0.69
9	e3.2	e1.5	e0.94	e1.7	e1.7	e2.6	e5.8	e130	7.1	14	0.37	0.67
10	e2.9	e1.9	e0.92	e0.40	e2.4	e2.4	e8.1	1,060	23	9.3	0.45	0.56
11	e2.9	e2.3	e0.91	e0.59	e2.8	e4.0	e11	400	18	2.8	0.69	0.33
12	e3.0	e2.4	e0.68	e0.77	e3.5	e7.5	e9.9	e17	5.7	1.6	0.79	0.46
13	e2.8	e2.4	e0.56	e0.43	e3.9	e8.7	e12	e29	4.0	1.2	0.63	8.7
14	e2.9	e2.4	e0.56	e0.53	e3.8	e10	e12	43	3.7	1.1	0.50	13
15	e3.0	e2.6	e0.52	e0.57	e3.0	e30	e13	47	2.9	0.95	0.50	1.9
16	e2.4	e1.6	e0.54	e0.47	e2.8	e39	e12	35	2.0	0.83	0.52	0.84
17	e2.6	e1.6	e0.61	e0.13	e2.4	e43	e13	31	1.8	0.75	0.51	0.47
18	e2.8	e1.5	e0.58	e0.11	e4.1	e29	e12	24	1.7	0.73	0.45	0.33
19	e2.6	e1.6	e0.77	e0.41	e3.7	e13	e18	19	1.6	0.71	0.45	0.35
20	e2.0	e1.8	e0.61	e0.56	e8.3	e12	e25	18	e1.3	0.69	0.50	0.26
21	e1.8	e1.7	e0.67	e0.23	e12	e15	e22	15	e1.3	e0.64	0.50	0.65
22	e1.4	e1.7	e0.43	e0.18	e7.3	e13	e19	13	e1.2	e0.56	0.45	1.3
23	e1.3	e1.6	e0.36	e0.30	e4.0	e13	e20	14	e1.2	e0.50	e0.44	1.8
24	e2.2	e1.4	e0.45	e0.36	e2.7	e13	e17	15	1.2	e0.46	e0.44	1.7
25	e3.5	e1.3	e0.63	e0.93	e2.3	e13	e22	19	e2.1	e0.48	e0.45	1.5
26	e2.6	e0.86	e0.41	e0.44	e4.6	e12	e21	15	e2.5	e0.56	e1.7	e1.1
27	e2.0	e0.59	e0.65	e0.27	e6.2	e11	e19	11	e2.5	0.80	1.1	e1.0
28	e1.8	e1.0	e0.94	e0.62	e4.6	e11	e18	11	e2.4	3.8	1.1	e1.1
29	e1.9	e1.2	e0.85	e1.8	---	e5.9	e17	9.0	e2.1	1.8	2.3	e1.2
30	e2.3	e1.0	e1.7	e2.0	---	e8.3	e23	8.1	e2.3	1.0	1.6	e1.5
31	e2.1	---	e1.4	e2.6	---	e12	---	6.9	---	e0.79	5.2	---
TOTAL	96.5	44.42	23.78	23.16	103.9	356.7	415.9	2,702.0	154.0	61.15	25.39	59.76
MEAN	3.11	1.48	0.77	0.75	3.71	11.5	13.9	87.2	5.13	1.97	0.82	1.99
MAX	7.2	2.6	1.7	2.6	12	43	25	1,060	23	14	5.2	13
MIN	1.3	0.59	0.36	0.11	1.3	1.3	3.0	6.9	1.2	0.46	0.37	0.26
AC-FT	191	88	47	46	206	708	825	5,360	305	121	50	119
CFSM	0.04	0.02	0.01	0.01	0.04	0.13	0.16	0.99	0.06	0.02	0.01	0.02
IN.	0.04	0.02	0.01	0.01	0.04	0.15	0.18	1.15	0.07	0.03	0.01	0.03

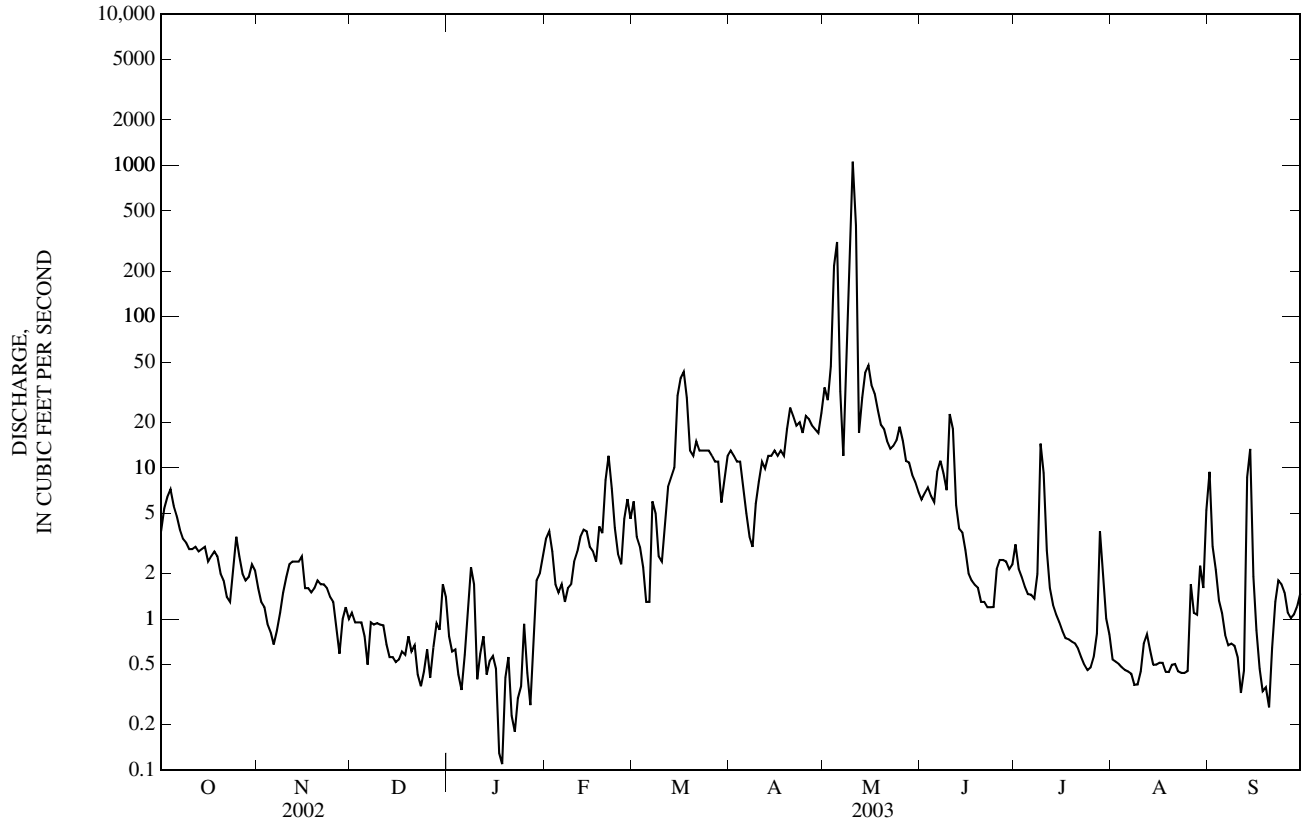
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2003, BY WATER YEAR (WY)

MEAN	32.4	23.3	19.8	28.3	57.7	100	98.0	86.3	43.7	26.0	28.8	38.4
MAX	178	222	115	127	158	291	370	325	257	163	254	377
(WY)	(1960)	(1962)	(1971)	(1973)	(1959)	(1960)	(1973)	(1973)	(2001)	(1969)	(1970)	(1970)
MIN	0.21	0.53	0.32	0.59	0.67	1.07	1.17	0.69	0.73	1.09	0.20	0.27
(WY)	(1964)	(1965)	(1964)	(1964)	(1964)	(1964)	(2000)	(2000)	(1963)	(1972)	(1961)	(1999)

05494300 FOX RIVER AT BLOOMFIELD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1958 - 2003	
ANNUAL TOTAL	13,816.40		4,066.66			
ANNUAL MEAN	37.9		11.1		49.0	
HIGHEST ANNUAL MEAN					117	1973
LOWEST ANNUAL MEAN					8.40	1964
HIGHEST DAILY MEAN	2,370	May 11	1,060	May 10	4,370	May 6, 1960
LOWEST DAILY MEAN	0.36	Dec 23	0.11	Jan 18a	0.00	Oct 1, 1957
ANNUAL SEVEN-DAY MINIMUM	0.43	Sep 12	0.27	Jan 17	0.00	Oct 1, 1957
MAXIMUM PEAK FLOW			2,390	May 10	8,600	May 6, 1960
MAXIMUM PEAK STAGE			12.38	May 10	24.02	May 6, 1960
INSTANTANEOUS LOW FLOW					0.00	Oct 1, 1957
ANNUAL RUNOFF (AC-FT)	27,400		8,070		35,470	
ANNUAL RUNOFF (CFSM)	0.43		0.13		0.56	
ANNUAL RUNOFF (INCHES)	5.86		1.72		7.58	
10 PERCENT EXCEEDS	56		17		74	
50 PERCENT EXCEEDS	6.4		1.9		5.0	
90 PERCENT EXCEEDS	0.68		0.47		0.50	

a Ice affected
e Estimated



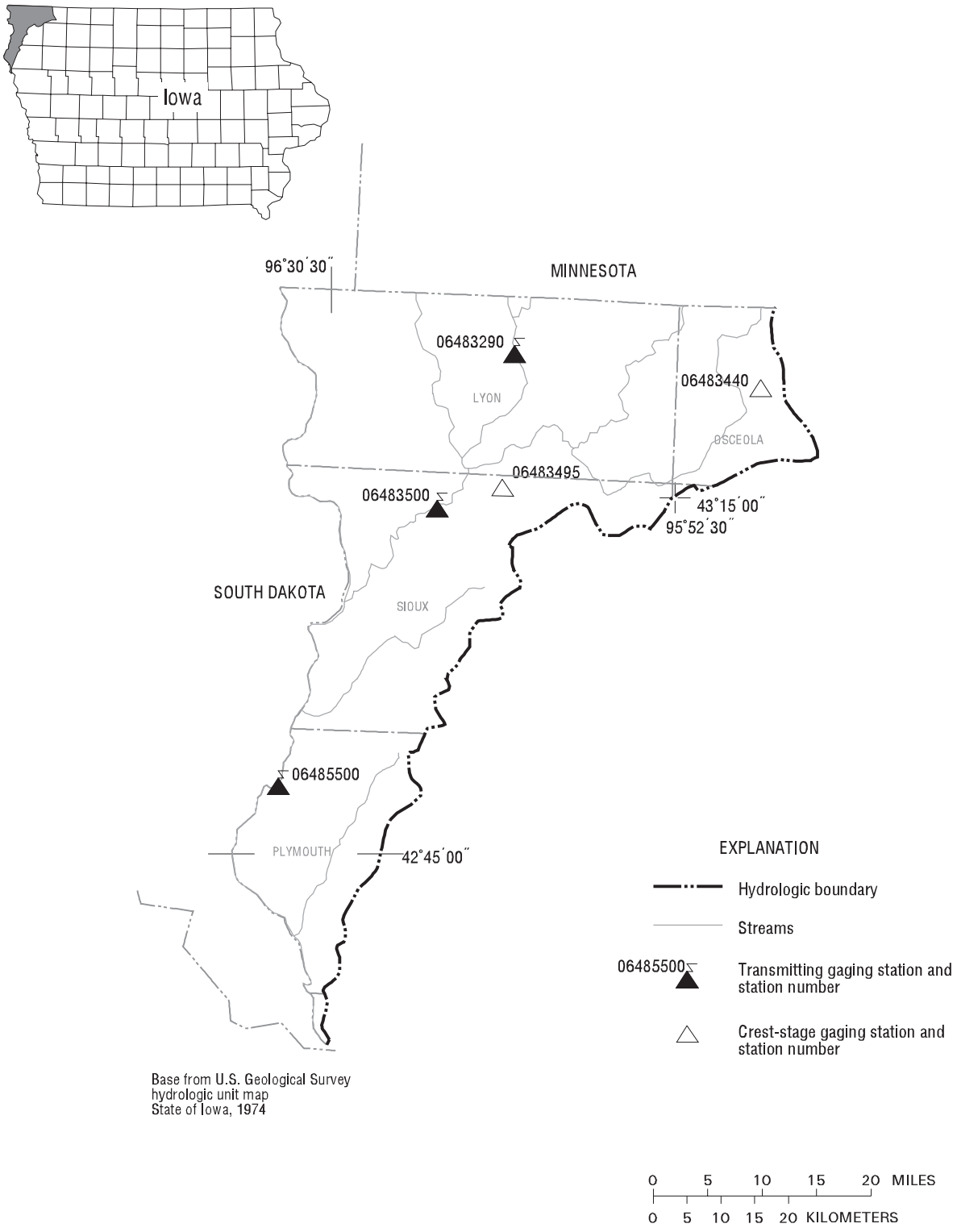


Figure 15. Locations of active continuous-record and crest-stage gaging stations in the Big Sioux River drainage basin.

Gaging Stations

06483290 Rock River below Tom Creek at Rock Rapids, IA 360
06483500 Rock River near Rock Valley, IA. 362
06485500 Big Sioux River at Akron, IA. 364

Crest Stage Gaging Stations

06483440 Dawson Creek near Sibley, IA 462
06483495 Burr Oak Creek near Perkins, IA 462

06483290 ROCK RIVER BELOW TOM CREEK AT ROCK RAPIDS, IA

LOCATION.--Lat 43°25'23", long 96°09'52", in SW¼ NW¼ SE¼ sec. 4, T.99 N., R.45 W., Lyon County, Hydrologic Unit 10170204, on right bank 5 ft downstream from bridge on gravel road in Campbell Park, near waterworks lift station, 200 ft east of Tama St and 8th Ave, 1.1 mi downstream of mouth of Tom Creek, and at mile 41.4.

DRAINAGE AREA.--853 mi^2.

PERIOD OF RECORD.--May 1, 2001 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,308.57 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 8, 1969 reached a stage of 10.23 ft, discharge 29,000 ft^3/s, at discontinued gaging station 1.4 mile upstream and above Tom Creek.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	106	e59	e74	e25	e48	74	284	185	270	42	22
2	38	114	e69	e71	e27	e39	71	306	185	236	40	23
3	40	136	e76	e66	e32	e35	70	278	196	206	39	21
4	64	133	e76	e65	e36	e21	70	271	212	200	37	21
5	86	128	e66	e64	e33	e20	70	300	214	170	42	21
6	142	128	e75	e66	e21	e28	70	347	202	165	43	20
7	229	129	e78	e70	e17	e25	66	372	208	148	40	20
8	233	129	e76	e77	e29	e26	69	344	226	155	38	19
9	209	130	e70	e63	e36	e28	79	341	282	166	36	19
10	184	126	e69	e46	e24	e31	96	383	363	233	38	64
11	168	121	e70	e40	e31	e29	113	534	357	293	34	219
12	159	117	e74	e40	e28	e35	140	748	344	253	32	381
13	152	113	e76	e47	e30	e68	149	780	315	216	30	445
14	142	111	e73	e56	e29	147	131	688	268	e182	29	339
15	133	109	e71	e49	e25	280	123	658	232	e152	29	222
16	127	107	e76	e44	e22	e668	136	661	206	e129	28	164
17	125	100	e74	e44	e23	e791	234	588	187	e110	27	132
18	124	108	e80	e49	e31	402	837	502	221	e95	27	115
19	122	112	e84	e46	e32	258	732	449	250	e85	30	101
20	122	107	e77	e40	e36	200	845	422	232	e82	31	91
21	117	103	e67	e30	e46	156	866	406	189	e79	31	88
22	116	102	e67	e20	e40	131	682	379	183	e76	28	82
23	115	102	e61	e14	e35	115	557	349	264	74	27	77
24	115	94	e61	e23	e31	106	470	328	354	68	27	71
25	113	68	e65	e21	e36	99	415	310	344	65	31	66
26	112	e60	e65	e12	e38	91	374	292	356	60	32	64
27	115	e68	e68	e14	e42	90	336	268	409	55	26	60
28	119	e81	e69	e20	e43	89	305	246	375	51	24	56
29	120	e94	e73	e22	---	82	275	228	336	49	22	53
30	123	e77	e75	e22	---	78	277	211	312	47	22	52
31	120	---	e72	e23	---	75	---	200	---	45	22	---
TOTAL	3,923	3,213	2,212	1,338	878	4,291	8,732	12,473	8,007	4,215	984	3,128
MEAN	127	107	71.4	43.2	31.4	138	291	402	267	136	31.7	104
MAX	233	136	84	77	46	791	866	780	409	293	43	445
MIN	38	60	59	12	17	20	66	200	183	45	22	19
AC-FT	7,780	6,370	4,390	2,650	1,740	8,510	17,320	24,740	15,880	8,360	1,950	6,200
CFSM	0.15	0.13	0.08	0.05	0.04	0.16	0.34	0.47	0.31	0.16	0.04	0.12
IN.	0.17	0.14	0.10	0.06	0.04	0.19	0.38	0.54	0.35	0.18	0.04	0.14

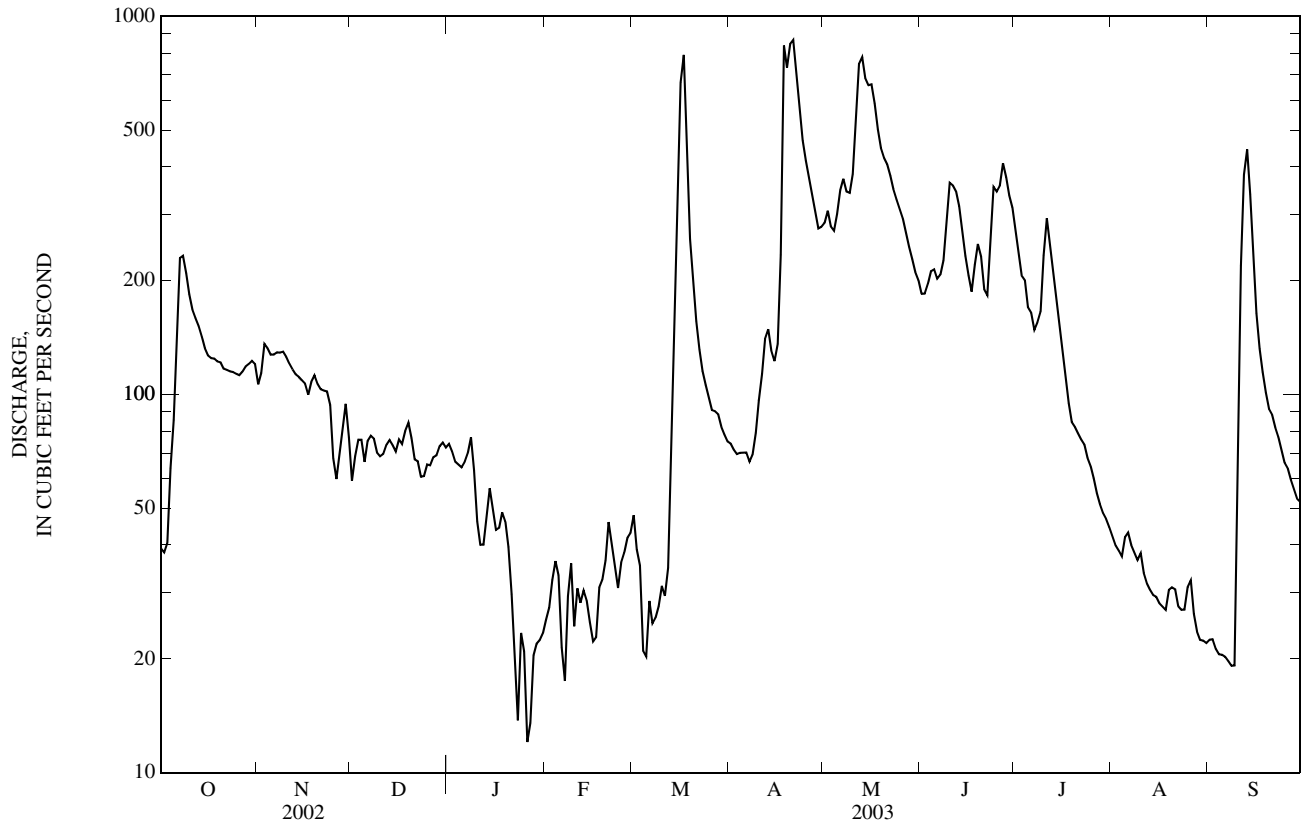
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2003, BY WATER YEAR (WY)

MEAN	90.5	105	154	66.5	73.3	165	289	643	579	248	121	71.2
MAX	127	107	237	89.9	115	192	291	1,216	1,295	561	177	104
(WY)	(2003)	(2003)	(2002)	(2002)	(2002)	(2002)	(2003)	(2001)	(2001)	(2001)	(2002)	(2003)
MIN	54.4	103	71.4	43.2	31.4	138	286	310	174	48.2	31.7	46.3
(WY)	(2002)	(2002)	(2003)	(2003)	(2003)	(2003)	(2002)	(2002)	(2002)	(2002)	(2003)	(2002)

06483290 ROCK RIVER BELOW TOM CREEK AT ROCK RAPIDS, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2001 - 2003	
ANNUAL TOTAL	53,135		53,394			
ANNUAL MEAN	146		146		150	
HIGHEST ANNUAL MEAN					153	2002
LOWEST ANNUAL MEAN					146	2003
HIGHEST DAILY MEAN	1,070	Mar 30	866	Apr 21	8,870	Jun 13, 2001
LOWEST DAILY MEAN	25	Aug 2	12	Jan 26a	12	Jan 26, 2003a
ANNUAL SEVEN-DAY MINIMUM	27	Jul 28	18	Jan 22	18	Jan 22, 2003
MAXIMUM PEAK FLOW			970	Apr 20	12,000	Jun 13, 2001
MAXIMUM PEAK STAGE			11.24	Mar 17b	19.30	Jun 13, 2001
INSTANTANEOUS LOW FLOW			12	Jan 26		
ANNUAL RUNOFF (AC-FT)	105,400		105,900		108,500	
ANNUAL RUNOFF (CFSM)	0.17		0.17		0.18	
ANNUAL RUNOFF (INCHES)	2.32		2.33		2.39	
10 PERCENT EXCEEDS	289		345		337	
50 PERCENT EXCEEDS	109		82		94	
90 PERCENT EXCEEDS	39		27		32	

a Ice affected.
b Backwater from ice jam.
e Estimated.



06483500 ROCK RIVER NEAR ROCK VALLEY, IA

LOCATION.--Lat 43°12'52", long 96°17'39", in SW¼ SW¼ sec.16, T.97 N., R.46 W., Sioux County, Hydrologic Unit 10170204, on left bank 15 ft upstream from bridge on county highway K30, 0.3 mi north of Rock Valley, and at mile 19.1.

DRAINAGE AREA.--1,592 mi^2.

PERIOD OF RECORD.--June 1948 to current year.

REVISED RECORDS.--WSP 1439: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,222.54 ft above NGVD of 1929. Prior to Aug. 13, 1952, nonrecording gage with supplementary water-stage recorder operating above 6.2 ft gage height. June 4, 1949 to Aug. 12, 1952 and Aug. 13, 1952 to May 4, 1976, water-stage recorder, at site 3.2 mi downstream at datum 10.73 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of 17.0 ft, former site and datum, discharge not determined, from information by State Highway Commission.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	164	e100	e116	e42	e66	133	400	354	526	90	43
2	76	153	e111	e112	e44	e57	126	405	346	458	82	42
3	76	197	e119	e102	e48	e54	121	400	350	403	78	41
4	94	205	e119	e108	e55	e42	120	389	360	382	75	40
5	115	202	e104	e105	e52	e42	118	417	367	360	83	39
6	140	194	e119	e101	e42	e51	118	459	368	356	76	38
7	219	193	e119	e92	e38	e45	109	515	361	324	90	37
8	299	193	e119	e118	e50	e46	117	525	379	455	98	36
9	297	193	e111	e98	e59	e48	124	521	403	491	96	39
10	290	191	e111	e81	e49	e50	143	543	506	497	88	78
11	263	182	e111	e74	e55	e53	185	729	571	565	74	215
12	245	175	e119	e71	e52	e56	221	983	574	539	68	381
13	233	169	e122	e75	e54	e96	266	1,200	561	455	65	473
14	220	165	e119	e84	e52	347	259	1,150	513	389	64	456
15	204	161	e115	e77	e47	610	246	1,060	456	337	65	355
16	196	156	e122	e67	e44	634	245	1,020	409	296	66	273
17	191	148	e122	e60	e45	841	274	946	378	268	66	218
18	187	152	e134	e67	e52	807	556	837	364	241	e66	187
19	181	157	e141	e66	e53	517	892	766	383	217	e69	166
20	177	157	e145	e60	e58	406	851	738	390	195	e70	145
21	177	151	e134	e57	e68	326	1,050	718	348	179	e68	132
22	174	146	e118	e47	e64	270	902	706	327	170	e65	123
23	171	145	e106	e33	e60	232	764	661	368	164	e63	113
24	173	141	e102	e40	e55	202	670	628	490	146	e62	107
25	172	e119	e100	e36	e57	179	597	598	620	133	e65	97
26	170	e104	e104	e26	e60	162	533	556	625	123	e65	94
27	172	e111	e109	e32	e61	168	484	514	703	113	e58	e89
28	182	e130	e106	e34	e63	178	440	479	718	109	48	e85
29	184	e137	e110	e36	---	162	401	433	649	104	46	e81
30	186	e115	e116	e36	---	148	399	407	585	101	44	e79
31	183	---	e112	e37	---	139	---	372	---	96	43	---
TOTAL	5,716	4,806	3,599	2,148	1,479	7,034	11,464	20,075	13,826	9,192	2,156	4,302
MEAN	184	160	116	69.3	52.8	227	382	648	461	297	69.5	143
MAX	299	205	145	118	68	841	1,050	1,200	718	565	98	473
MIN	69	104	100	26	38	42	109	372	327	96	43	36
AC-FT	11,340	9,530	7,140	4,260	2,930	13,950	22,740	39,820	27,420	18,230	4,280	8,530
CFSM	0.12	0.10	0.07	0.04	0.03	0.14	0.24	0.41	0.29	0.19	0.04	0.09
IN.	0.13	0.11	0.08	0.05	0.03	0.16	0.27	0.47	0.32	0.21	0.05	0.10

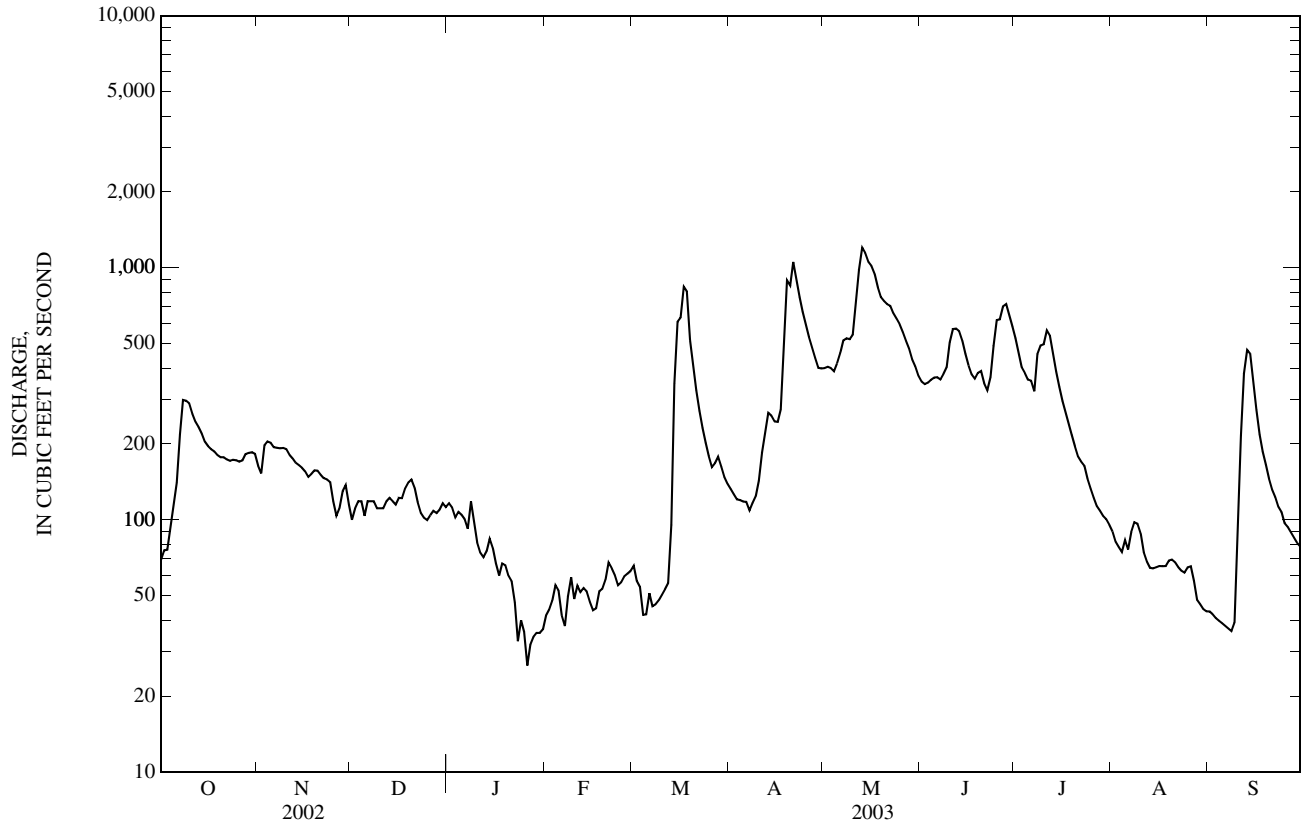
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2003, BY WATER YEAR (WY)

MEAN	231	258	148	81.8	218	993	1,320	714	960	600	267	230
MAX	1,232	2,039	676	434	1,059	4,646	6,507	3,728	6,495	9,088	2,251	2,135
(WY)	(1993)	(1980)	(1983)	(1996)	(1966)	(1997)	(1969)	(1993)	(1993)	(1993)	(1993)	(1986)
MIN	2.39	9.70	3.22	0.037	0.30	35.1	35.9	44.4	46.3	21.9	6.79	3.26
(WY)	(1959)	(1959)	(1959)	(1977)	(1959)	(1959)	(1959)	(1968)	(1964)	(1976)	(1976)	(1955)

06483500 ROCK RIVER NEAR ROCK VALLEY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1949 - 2003	
ANNUAL TOTAL	99,210		85,797			
ANNUAL MEAN	272		235		502	
HIGHEST ANNUAL MEAN					2,656	1993
LOWEST ANNUAL MEAN					31.0	1968
HIGHEST DAILY MEAN	1,150	Aug 23	1,200	May 13	35,400	Apr 7, 1969
LOWEST DAILY MEAN	63	Aug 20	26	Jan 26a	0.00	Feb 20, 1959b
ANNUAL SEVEN-DAY MINIMUM	67	Sep 22	34	Jan 23	0.00	Feb 27, 1959
MAXIMUM PEAK FLOW			1,230	May 13	40,400	Apr 7, 1969
MAXIMUM PEAK STAGE			6.24	May 13	17.32	Apr 7, 1969c
INSTANTANEOUS LOW FLOW			26	Jan 26		
ANNUAL RUNOFF (AC-FT)	196,800		170,200		363,500	
ANNUAL RUNOFF (CFSM)	0.17		0.15		0.32	
ANNUAL RUNOFF (INCHES)	2.32		2.00		4.28	
10 PERCENT EXCEEDS	569		558		1,130	
50 PERCENT EXCEEDS	183		141		136	
90 PERCENT EXCEEDS	78		49		17	

a Ice affected.
b Many days during winter periods in 1959 and 1977.
c At location and datum then in use.
e Estimated.



06485500 BIG SIOUX RIVER AT AKRON, IA

LOCATION.--Lat 42°50'14", long 96°33'41", in SW$^1/_4$ SE$^1/_4$ SW$^1/_4$ sec.30, T.93 N., R.48 W., Plymouth County, Hydrologic Unit 10170203, on left bank 15 ft downstream from Iowa Highway 403 bridge, 0.5 mi northwest of Akron, and 2.9 mi upstream from Union Creek.

DRAINAGE AREA.--8,424 mi^2, of which 1,487 mi^2 usually is noncontributing (documented runoff occurred during 1994-2002 water years for 213 mi^2 of the usually noncontributing area).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1928 to current year.

REVISED RECORDS.--WSP 1309: 1929(M), 1931-33(M), 1936(M), 1938(M), 1940(M). WSP 1389: Drainage area. WDR SD-84-1: Drainage area. WDR SD-94-1 only: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,118.90 ft above NGVD of 1929. Prior to Dec. 3, 1934, nonrecording gage at bridge 0.5 mi downstream at same datum. From Dec. 3, 1934, to Oct. 31, 1985, water-stage recorder at site 0.6 mi downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data-collection platform at station. Water temperature and specific conductance measured during the year are compiled in the Miscellaneous Temperature Measurements and Field Determinations section.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	297	670	e430	e430	e245	e190	575	1,380	1,150	2,070	361	166
2	316	662	e400	e430	e250	e190	548	1,430	1,110	1,860	347	163
3	351	649	e380	e430	e250	e190	522	1,390	1,080	1,650	330	160
4	425	653	e360	e430	e245	e185	493	1,370	1,050	1,560	311	157
5	446	678	e370	e440	e235	e185	480	1,390	1,040	1,480	319	155
6	686	697	e410	e440	e220	e195	476	1,500	1,050	1,400	327	160
7	800	711	e480	e440	e210	e200	488	1,580	1,050	1,310	317	150
8	872	706	e500	e460	e205	e205	489	1,580	1,060	1,860	358	145
9	903	700	e490	e450	e200	e210	497	1,580	1,150	2,840	315	147
10	872	695	e470	e420	e190	e220	502	1,610	1,190	2,140	286	204
11	840	696	e450	e380	e180	e250	548	1,840	1,410	1,850	272	381
12	804	693	e440	e340	e170	e400	597	1,990	1,490	1,700	265	1,060
13	751	683	e430	e310	e165	e430	624	2,380	1,460	1,580	247	1,400
14	725	672	e425	e325	e155	e550	641	2,660	1,410	1,380	245	1,220
15	700	657	e430	e325	e150	e750	634	2,730	1,300	1,200	253	981
16	682	651	e450	e320	e155	e1,100	617	2,660	1,160	1,080	223	732
17	672	640	e480	e315	e160	e1,400	621	2,580	1,080	958	212	569
18	655	631	e500	e300	e165	e1,800	678	2,470	985	858	203	481
19	644	631	e500	e295	e175	1,880	1,110	2,320	885	770	204	434
20	640	627	e500	e280	e187	1,380	1,810	2,180	861	717	198	401
21	630	627	e470	e265	e300	1,270	2,430	2,080	863	678	199	405
22	621	622	e430	e245	e250	1,400	2,880	2,000	845	621	195	385
23	619	620	e390	e235	e250	1,520	2,580	1,950	806	582	276	352
24	622	609	e360	e225	e250	1,370	2,350	1,850	1,050	557	232	339
25	623	e580	e330	e220	e240	1,120	2,160	1,760	1,630	527	203	321
26	619	e525	e340	e220	e210	936	1,960	1,690	2,040	489	191	318
27	619	e470	e390	e225	e200	883	1,770	1,610	2,550	459	182	303
28	634	e420	e420	e225	e195	844	1,620	1,520	2,900	438	177	291
29	642	e580	e440	e230	---	768	1,480	1,430	2,650	411	172	288
30	659	e580	e440	e235	---	689	1,410	1,330	2,330	391	168	282
31	671	---	e430	e240	---	638	---	1,230	---	378	166	---
TOTAL	20,040	19,035	13,335	10,125	5,807	23,348	33,590	57,070	40,635	35,794	7,754	12,550
MEAN	646	634	430	327	207	753	1,120	1,841	1,354	1,155	250	418
MAX	903	711	500	460	300	1,880	2,880	2,730	2,900	2,840	361	1,400
MIN	297	420	330	220	150	185	476	1,230	806	378	166	145
AC-FT	39,750	37,760	26,450	20,080	11,520	46,310	66,630	113,200	80,600	71,000	15,380	24,890

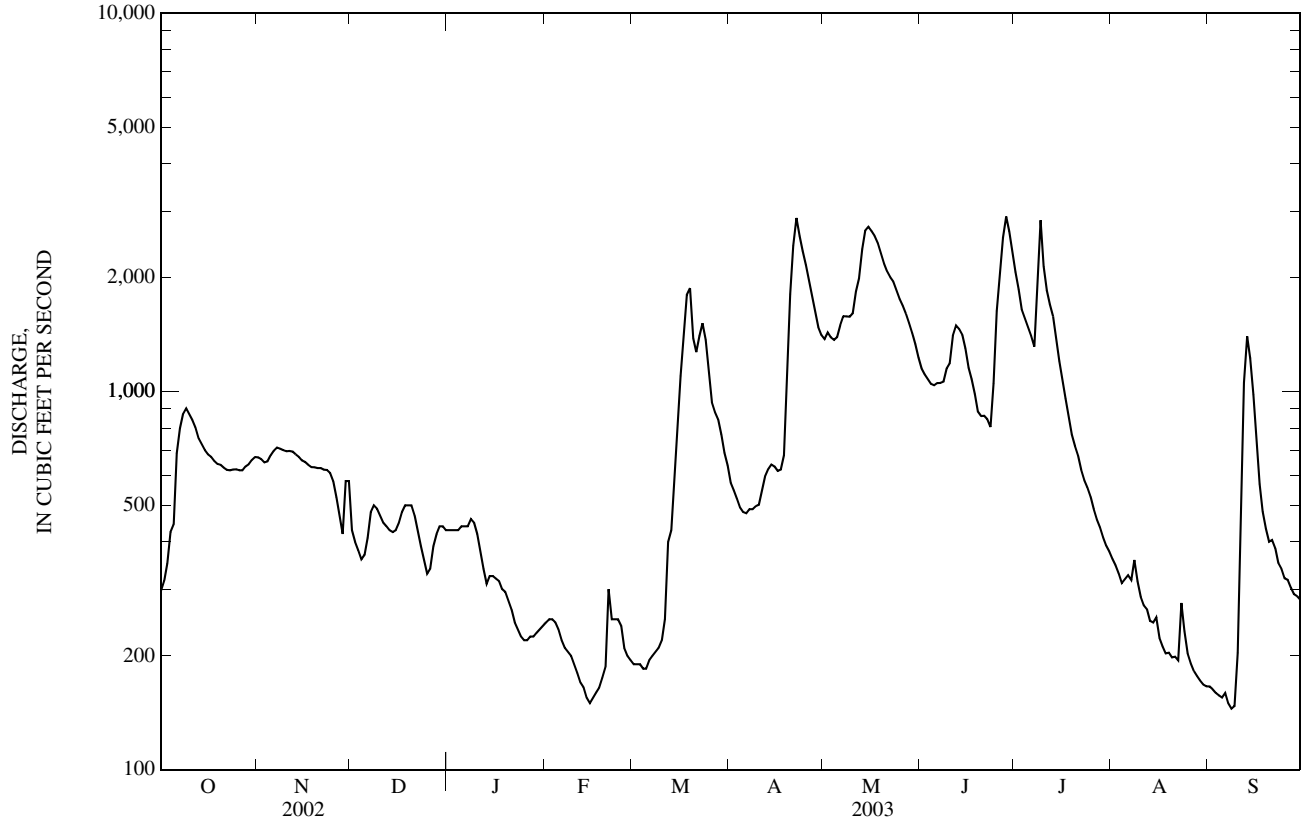
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)

MEAN	533	529	365	219	511	2,342	3,376	1,880	2,184	1,490	765	666
MAX	4,039	3,022	1,987	920	2,399	8,866	20,690	9,499	15,820	21,740	6,200	7,313
(WY)	(1987)	(1980)	(1999)	(1996)	(1966)	(1983)	(1969)	(1993)	(1984)	(1993)	(1993)	(1986)
MIN	32.9	47.9	32.1	6.68	12.1	124	139	73.3	100	50.7	45.2	36.4
(WY)	(1959)	(1959)	(1977)	(1977)	(1936)	(1931)	(1931)	(1934)	(1933)	(1931)	(1976)	(1976)

06485500 BIG SIOUX RIVER AT AKRON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1929 - 2003	
ANNUAL TOTAL	330,769		279,083			
ANNUAL MEAN	906		765		[a]1,239	
HIGHEST ANNUAL MEAN					6,271	1993
LOWEST ANNUAL MEAN					120	1931
HIGHEST DAILY MEAN	3,530	Apr 2	2,900	Jun 28	77,500	Apr 9, 1969
LOWEST DAILY MEAN	240	Sep 27	145	Sep 8	4.0	Jan 17, 1977
ANNUAL SEVEN-DAY MINIMUM	249	Sep 24	153	Sep 3	4.4	Jan 15, 1977
MAXIMUM PEAK FLOW			3,400	Jul 9	80,800	[b]Apr 9, 1969
MAXIMUM PEAK STAGE			11.02	Jul 9	23.38	[c]Apr 26, 2001
ANNUAL RUNOFF (AC-FT)	656,100		553,600		897,600	
10 PERCENT EXCEEDS	1,900		1,720		2,910	
50 PERCENT EXCEEDS	680		548		409	
90 PERCENT EXCEEDS	356		200		72	

a Median of annual mean discharges, 820 ft^3/s.
b Gage height, 22.99 ft.
c Discharge, 40,400 ft^3/s.
e Estimated.



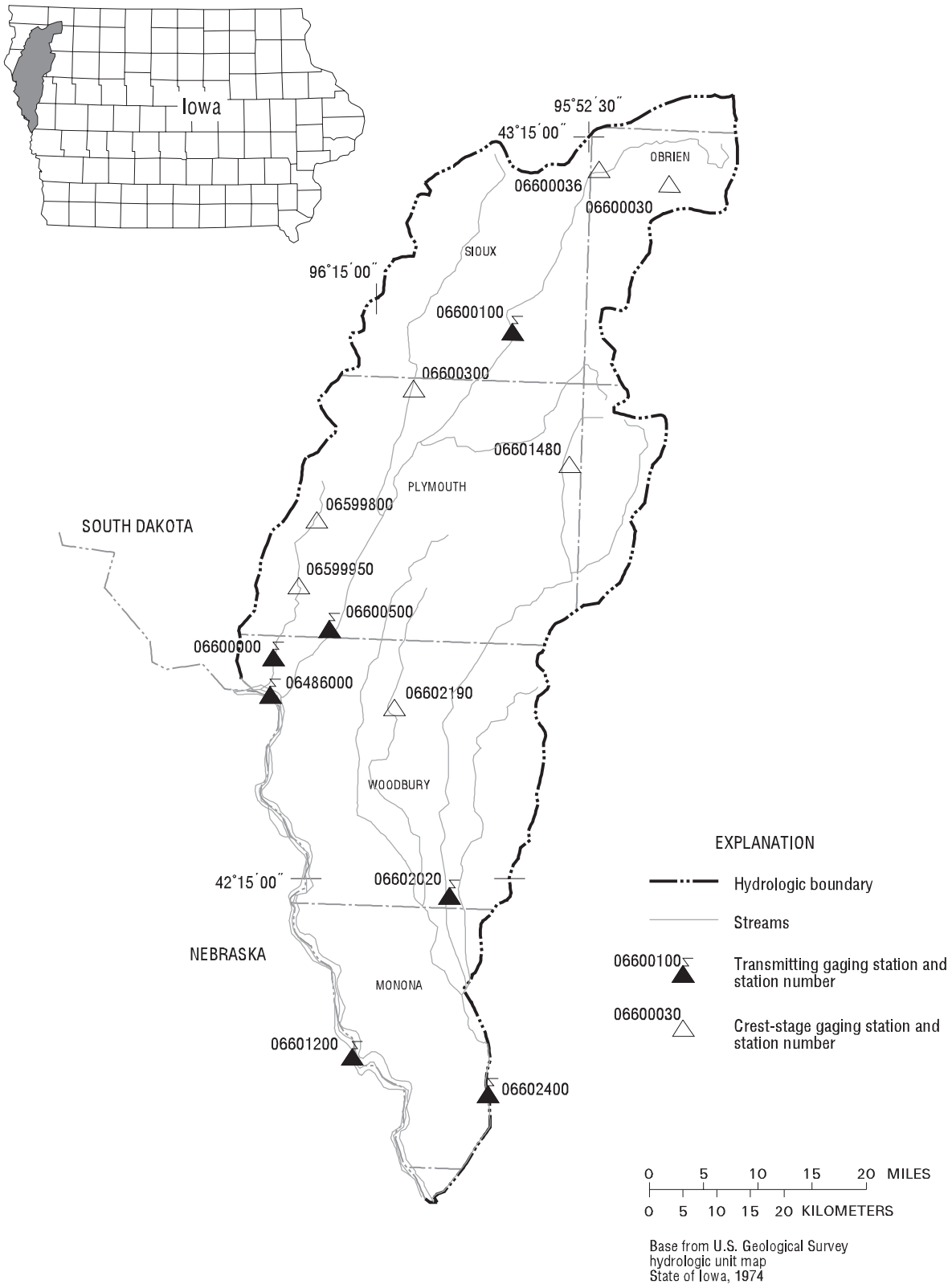


Figure 16. Locations of active continuous-record and crest-stage gaging stations in the Missouri River, Perry Creek, Floyd River, and Monona-Harrison Ditch drainage basins.

Gaging Stations

06486000 Missouri River at Sioux City, IA 368
06600000 Perry Creek at 38th Street, Sioux City, IA 370
06600100 Floyd River at Alton, IA. 372
06600500 Floyd River at James, IA 374
06601200 Missouri River at Decatur, NE. 376
06602020 West Fork Ditch at Hornick, IA 378
06602400 Monona-Harrison Ditch near Turin, IA 380

Crest Stage Gaging Stations

06599800 Perry Creek near Merrill, IA 462
06599950 Perry Creek near Hinton, IA. 462
06600030 Little Floyd River near Sanborn, IA. 462
06600036 Sweeney Creek Tributary near Sheldon, IA. 463
06600300 West Branch Floyd River near Struble, IA 463
06601480 Big Whiskey Slough near Remsen, IA. 463
06602190 Elliott Creek at Lawton, IA 463

06486000 MISSOURI RIVER AT SIOUX CITY, IA

LOCATION.--Lat. 42°29'09", long 96°24'49", in NW¼ SE¼ sec.16, T.29 N., R.9 E., sixth prinicipal meridian, Dakota County, Nebraska, Hydrologic Unit 10230001, on right bank on upstream side of bridge on U.S. Highway 20 and 77 at South Sioux City, Nebraska, 1.9 mi downstream from Big Sioux River, and at mile 732.2.

DRAINAGE.--314,600 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

PERIOD OF RECORD.--October 1897 to current year in reports of the U.S. Geological Survey. Prior to October 1928 and October 1931 to September 1938, monthly discharges only, published in WSP 1310. January 1879 to December 1890, monthly discharges only, in House Document 238, 73rd Congress, 2d session, Missouri River. Gage height records collected in this vicinity September 1878 to December 1899 are contained in reports of Missouri River Commission and since July 1889 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 716: 1929-30. WSP 876: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,056.98 ft above NGVD of 1929. Sept. 2, 1878 to Dec. 31, 1905, nonrecording gages at various locations within 1.7 mi of present site and at various datums. Jan. 1, 1906 to Feb. 14, 1935, nonrecording gage, and Feb. 15, 1935 to Sept. 30, 1969, water-stage recorder at site 227 ft downstream at datum 19.98 ft higher, and Oct. 1, 1969 to Sept. 30, 1970 at datum 20.00 ft higher. Oct. 1, 1970 to Jan. 30, 1981, water-stage recorder at site 227 ft downstream at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 441,000 ft^3/s Apr. 14, 1952, gage height, 24.28 ft, datum then in use; minimum, 2,500 ft^3/s Dec. 29, 1941; minimum gage height, 7.02 ft Jan. 19, 1996.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32,900	28,700	13,800	14,200	14,400	16,800	25,000	28,800	27,800	31,500	26,900	24,400
2	33,000	28,100	14,000	14,200	14,700	15,600	24,900	28,300	28,100	31,100	26,800	25,500
3	33,200	27,400	14,200	14,100	14,700	14,000	25,100	28,100	28,100	30,400	26,800	27,700
4	32,900	27,400	14,300	14,300	13,300	14,200	25,200	28,600	27,700	29,800	26,800	29,100
5	32,000	27,600	14,100	14,400	13,900	11,500	25,100	29,200	27,800	29,800	27,300	29,600
6	31,500	27,900	14,000	14,300	16,400	12,100	25,300	28,500	27,700	29,600	27,400	29,600
7	32,000	27,900	14,300	14,100	15,300	15,000	25,800	28,200	27,500	29,200	26,900	29,500
8	31,800	28,100	14,100	14,200	15,800	14,600	25,900	28,300	27,600	28,500	27,000	29,400
9	31,000	28,400	14,000	14,200	15,300	11,600	26,300	28,900	27,600	30,800	27,100	29,700
10	e31,400	28,600	14,300	13,400	14,000	11,300	26,300	28,800	32,200	34,000	27,100	32,700
11	31,000	28,600	14,100	13,000	13,700	13,700	26,200	29,700	32,200	33,000	27,000	35,000
12	31,400	28,400	14,200	13,700	13,700	15,900	26,300	28,900	28,900	31,300	26,000	33,500
13	31,400	28,500	14,000	14,300	13,900	15,400	26,200	29,200	28,600	30,100	24,000	31,100
14	31,000	28,600	13,900	13,900	14,400	15,200	26,100	30,300	28,300	28,400	21,600	29,400
15	31,500	28,500	13,900	13,300	14,400	14,500	26,200	30,700	28,200	27,700	21,100	28,900
16	31,700	28,500	13,900	13,400	13,900	15,100	26,500	30,600	28,000	26,800	22,300	28,600
17	32,000	28,400	13,900	13,500	13,800	17,900	27,000	30,500	27,800	26,600	24,300	28,400
18	31,800	28,500	14,100	15,200	14,500	21,600	26,400	30,400	27,700	26,200	25,300	28,900
19	31,700	28,400	14,200	15,900	14,100	24,000	27,000	30,500	27,300	25,900	25,400	28,800
20	31,800	28,300	14,000	17,400	15,200	24,200	27,500	30,100	27,100	25,800	25,200	28,100
21	32,000	28,300	13,700	16,100	18,500	23,400	28,400	29,400	27,000	25,600	25,100	28,100
22	e31,800	28,300	13,900	15,800	15,700	23,400	28,100	29,200	27,200	25,700	24,900	28,200
23	e32,100	28,400	13,900	15,400	13,900	23,900	27,500	29,200	27,300	25,600	24,700	27,800
24	31,800	e28,200	13,400	15,500	11,500	24,100	27,500	29,000	30,100	25,500	24,800	27,400
25	31,100	e24,800	13,200	16,200	10,100	23,800	27,400	28,900	33,500	25,700	24,700	27,200
26	31,000	22,500	14,400	16,000	11,500	24,100	26,100	28,600	32,000	25,800	24,700	27,100
27	31,200	19,300	14,900	15,800	15,200	25,400	26,100	28,300	31,500	25,800	24,500	27,100
28	31,800	16,400	14,900	16,800	16,800	26,200	26,300	28,200	31,500	25,900	24,500	27,100
29	30,500	14,600	14,700	15,700	---	25,400	26,900	27,800	31,800	25,700	24,700	27,200
30	29,100	14,100	14,500	13,700	---	24,900	28,900	27,900	31,700	26,300	24,400	27,300
31	29,200	---	14,200	14,400	---	25,000	---	27,800	---	26,800	24,400	---
TOTAL	978,600	789,700	437,000	456,400	402,600	583,800	793,500	900,900	869,800	870,900	783,700	862,400
MEAN	31,570	26,320	14,100	14,720	14,380	18,830	26,450	29,060	28,990	28,090	25,280	28,750
MAX	33,200	28,700	14,900	17,400	18,500	26,200	28,900	30,700	33,500	34,000	27,400	35,000
MIN	29,100	14,100	13,200	13,000	10,100	11,300	24,900	27,800	27,000	25,500	21,100	24,400
AC-FT	1,941,000	1,566,000	866,800	905,300	798,600	1,158,000	1,574,000	1,787,000	1,725,000	1,727,000	1,554,000	1,711,000
CFSM	0.10	0.08	0.04	0.05	0.05	0.06	0.08	0.09	0.09	0.09	0.08	0.09
IN.	0.12	0.09	0.05	0.05	0.05	0.07	0.09	0.11	0.10	0.10	0.09	0.10

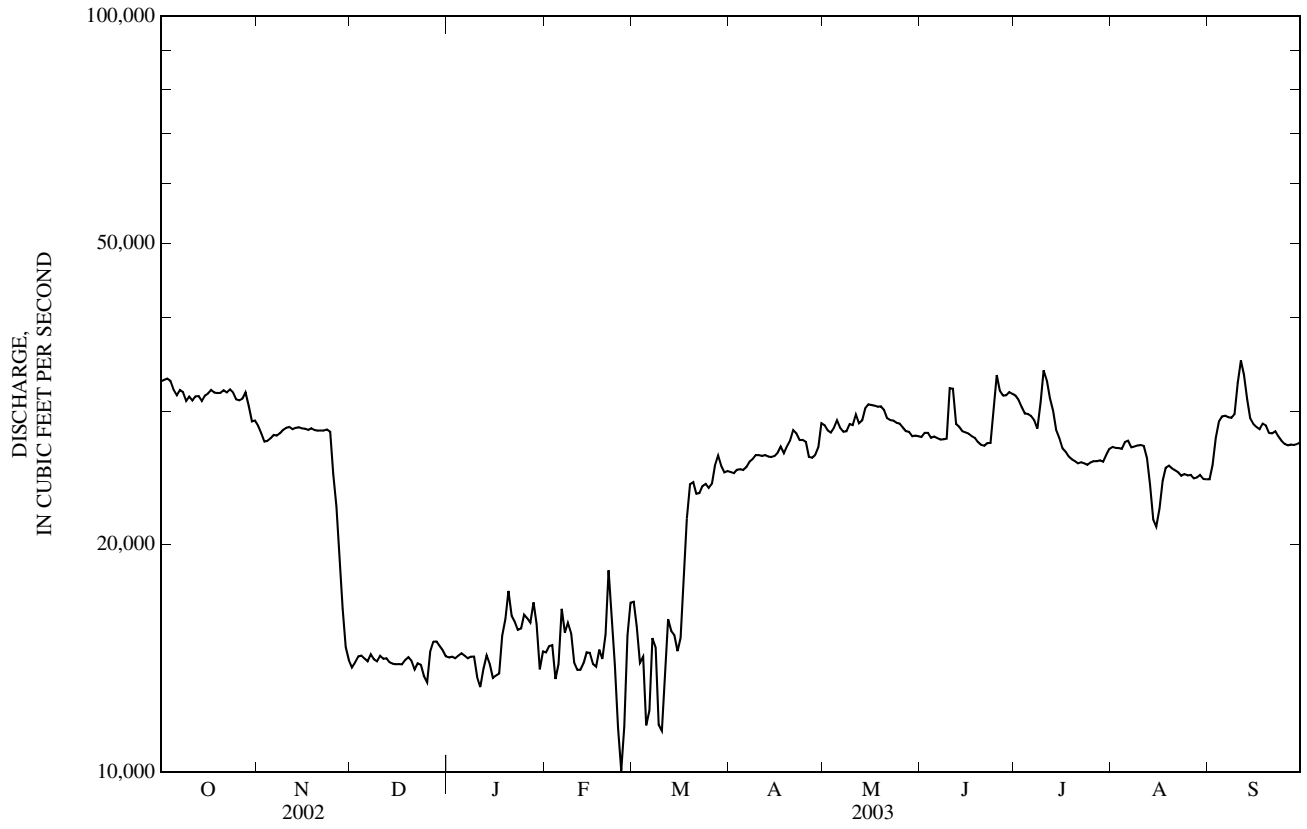
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2003, BY WATER YEAR (WY)

MEAN	36,060	31,260	18,830	16,110	17,220	23,210	33,250	33,800	35,410	35,930	36,250	36,560
MAX	69,300	71,600	39,880	27,720	31,120	47,020	88,040	78,720	66,400	65,550	65,360	66,400
(WY)	(1998)	(1998)	(1998)	(1987)	(1997)	(1997)	(1997)	(1997)	(1997)	(1997)	(1997)	(1997)
MIN	14,350	6,951	8,271	7,316	6,293	9,135	17,450	23,820	23,270	26,380	24,270	25,790
(WY)	(1962)	(1962)	(1962)	(1964)	(1963)	(1957)	(1957)	(1962)	(1960)	(2002)	(1993)	(1962)

06486000 MISSOURI RIVER AT SIOUX CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1953 - 2003a	
ANNUAL TOTAL	8,771,100		8,729,300			
ANNUAL MEAN	24,030		23,920		29,530	
HIGHEST ANNUAL MEAN					55,890	1997
LOWEST ANNUAL MEAN					19,770	1957
HIGHEST DAILY MEAN	34,700	Aug 23	35,000	Sep 11	105,000	Jun 25, 1953
LOWEST DAILY MEAN	13,200	Dec 25	10,100	Feb 25	3,000	Dec 11, 1961
ANNUAL SEVEN-DAY MINIMUM	13,800	Dec 19	12,800	Mar 5	5,430	Feb 22, 1963
MAXIMUM PEAK FLOW			36,200	Sep 11	101,000	Apr 3, 1960
MAXIMUM PEAK STAGE			16.83	Sep 11	30.65	Feb 19, 1971
INSTANTANEOUS LOW FLOW			9,610	Feb 25		
ANNUAL RUNOFF (AC-FT)	17,400,000		17,310,000		21,400,000	
ANNUAL RUNOFF (CFSM)	0.076		0.076		0.094	
ANNUAL RUNOFF (INCHES)	1.04		1.03		1.28	
10 PERCENT EXCEEDS	31,600		31,300		46,200	
50 PERCENT EXCEEDS	26,200		26,600		29,900	
90 PERCENT EXCEEDS	14,700		14,000		12,100	

a Post regulation.
e Estimated.



06600000 PERRY CREEK AT 38th STREET, SIOUX CITY, IA

LOCATION.--Lat 42°32'08", long 96°24'39", in SE¼ SE¼ sec.8, T.89 N., R.47 W., Woodbury County, Hydrologic Unit 10230001, on left bank at downstream side of bridge on 38th Street in Sioux City, 1.9 mi downstream from West Branch, and 4.2 mi. upstream from mouth.

DRAINAGE AREA.--65.1 mi^2.

PERIOD OF RECORD.--October 1945 to September 1969, June 1981 to current year.

REVISED RECORDS.--WSP 1440: Drainage area. WDR IA-95-1: River mile.

GAGE.--Water-stage recorder. Datum of gage is 1,112.04 ft above NGVD of 1929 (City of Sioux City benchmark). Prior to May 20, 1954, nonrecording gage with supplementary water-stage recorder in operation above 5.0 ft gage height and May 20, 1954 to Sept. 30, 1969, water-stage recorder at present site at datum 5.0 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 7, 1944 reached a stage of about 30.5 ft from floodmarks, present datum, discharge, 9,600 ft^3/s, on basis of contracted-opening measurement of peak flow by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	11	e7.0	e11	e11	10	14	28	20	21	9.6	7.6
2	7.6	10	e5.7	e8.9	e12	e8.2	14	23	22	19	9.1	7.4
3	8.4	9.8	e5.3	e7.3	e9.0	9.7	14	22	20	18	8.7	7.0
4	13	9.6	e6.8	e11	e6.8	e8.6	14	40	19	20	8.8	6.2
5	8.9	11	e5.7	e9.5	e8.3	e7.0	12	40	31	19	12	6.3
6	8.3	9.6	8.5	e7.9	e6.5	e8.4	12	27	20	22	10	6.1
7	8.1	9.0	9.3	e6.7	e3.8	8.8	14	23	22	18	8.7	6.1
8	7.8	9.5	e7.9	13	e7.2	e8.1	14	24	22	18	8.4	6.4
9	8.1	9.9	e6.6	e7.9	e7.6	e6.1	15	76	42	20	8.5	13
10	8.1	10	e5.9	e6.5	e6.1	8.1	18	42	100	16	e8.3	35
11	7.8	9.8	9.5	e4.8	9.3	61	20	81	23	15	8.1	44
12	8.7	9.6	9.4	e5.5	9.1	89	17	43	19	14	7.9	16
13	8.1	9.8	8.6	e7.2	9.4	21	16	41	18	14	7.7	9.0
14	9.0	10	8.5	e7.9	e49	80	16	43	17	14	7.9	7.5
15	9.5	9.7	9.2	e7.2	88	41	16	34	e16	13	7.7	7.1
16	11	9.5	9.5	e4.4	21	19	16	31	15	12	7.5	7.1
17	11	9.3	9.6	e3.0	9.4	15	16	28	16	12	7.4	6.2
18	11	9.5	12	e6.4	8.5	15	17	26	17	12	8.7	7.7
19	10	9.3	e11	e8.4	11	16	20	25	15	12	8.3	4.9
20	9.5	9.2	e8.5	e7.1	390	21	19	24	15	12	8.0	4.0
21	9.1	9.1	e7.6	e7.7	181	16	18	23	15	11	7.6	4.6
22	9.3	9.0	e8.7	e6.8	25	13	16	23	20	11	7.1	4.5
23	9.1	9.4	e6.2	e2.7	13	13	16	23	20	11	7.1	4.2
24	10	9.5	e7.1	e7.1	e7.5	13	21	23	142	10	7.2	4.1
25	10	e6.8	e8.2	e6.4	e6.5	11	22	23	340	10	8.1	3.9
26	9.9	e6.6	e8.7	e3.8	9.4	11	20	22	61	9.1	7.2	4.4
27	11	e5.1	11	e4.8	9.2	41	20	20	32	9.0	7.1	4.6
28	12	e7.2	12	e6.4	9.5	36	20	20	26	9.6	7.0	e4.7
29	11	10	13	e6.1	---	18	19	20	24	9.6	7.1	4.7
30	12	e6.1	e11	e6.8	---	16	37	21	22	9.7	7.2	4.9
31	12	---	e9.2	e7.9	---	15	---	20	---	9.6	7.4	---
TOTAL	297.5	273.9	267.2	218.1	944.1	664.0	523	959	1,191	430.6	251.4	259.2
MEAN	9.60	9.13	8.62	7.04	33.7	21.4	17.4	30.9	39.7	13.9	8.11	8.64
MAX	13	11	13	13	390	89	37	81	340	22	12	44
MIN	7.6	5.1	5.3	2.7	3.8	6.1	12	20	15	9.0	7.0	3.9
AC-FT	590	543	530	433	1,870	1,320	1,040	1,900	2,360	854	499	514
CFSM	0.15	0.14	0.13	0.11	0.52	0.33	0.27	0.48	0.61	0.21	0.12	0.13
IN.	0.17	0.16	0.15	0.12	0.54	0.38	0.30	0.55	0.68	0.25	0.14	0.15

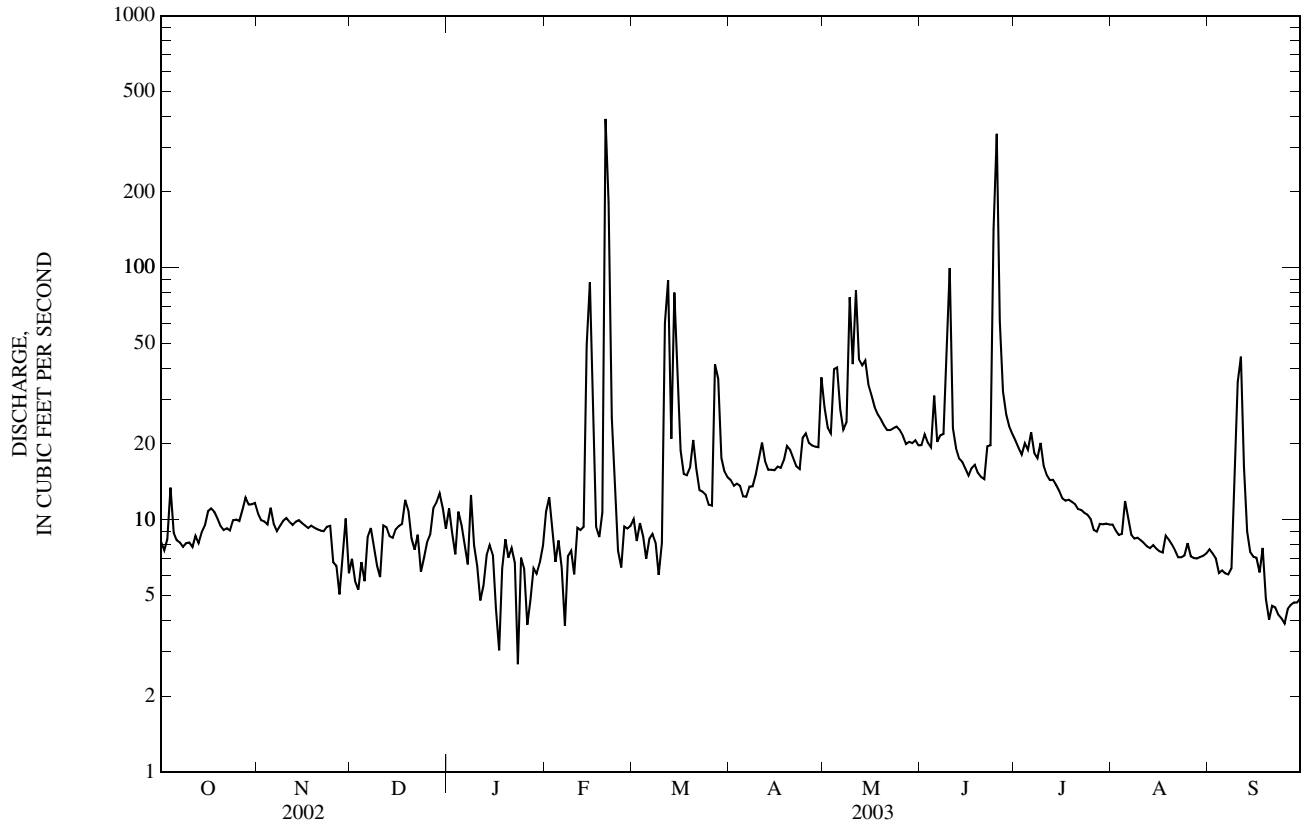
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 2003, BY WATER YEAR (WY)

MEAN	8.61	8.76	7.16	7.45	20.0	43.8	25.7	24.9	31.5	22.2	13.8	12.7
MAX	29.5	31.9	22.6	47.5	78.4	188	123	140	125	99.6	85.5	147
(WY)	(1993)	(1997)	(1999)	(1952)	(1948)	(1962)	(1985)	(1990)	(1984)	(1952)	(1951)	(1949)
MIN	0.38	0.81	0.48	0.33	1.31	2.62	2.30	2.91	0.94	0.35	0.30	0.083
(WY)	(1959)	(1982)	(1959)	(1982)	(1959)	(1964)	(1959)	(1968)	(1956)	(1946)	(1965)	(1958)

06600000 PERRY CREEK AT 38th STREET, SIOUX CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1946 - 2003	
ANNUAL TOTAL	5,737.4		6,279.0			
ANNUAL MEAN	15.7		17.2		18.9	
HIGHEST ANNUAL MEAN					38.6	1984
LOWEST ANNUAL MEAN					2.38	1968
HIGHEST DAILY MEAN	500	May 29	390	Feb 20	2,260	May 19, 1990
LOWEST DAILY MEAN	3.5	Mar 3	2.7	Jan 23a	0.00	Jul 14, 1946b
ANNUAL SEVEN-DAY MINIMUM	6.4	Nov 30	4.2	Sep 20	0.00	Sep 24, 1958
MAXIMUM PEAK FLOW			1,240	Jun 25	8,670	May 19, 1990c
MAXIMUM PEAK STAGE			12.47	Jun 25	28.54	May 19, 1990
INSTANTANEOUS LOW FLOW			2.7	Jan 23		
ANNUAL RUNOFF (AC-FT)	11,380		12,450		13,720	
ANNUAL RUNOFF (CFSM)	0.24		0.26		0.29	
ANNUAL RUNOFF (INCHES)	3.28		3.59		3.95	
10 PERCENT EXCEEDS	16		25		32	
50 PERCENT EXCEEDS	11		9.9		7.5	
90 PERCENT EXCEEDS	7.2		6.4		1.0	

a Ice affected.
b Many days 1946, 1958-1960.
c From rating curve extended above 1,700 ft^3/s on basis of slope-area measurements of peak flow.
e Estimated.



06600100 FLOYD RIVER AT ALTON, IA

LOCATION.--Lat 42°58'55", long 96°00'03", in NE¼ NE¼ sec.11, T.94 N., R.44 W., Sioux County, Hydrologic Unit 10230002, on right bank, 15 ft downstream from road on South County Road at east edge of Alton, 34.3 mi upstream from West Branch Floyd River, and at mile 58.1.

DRAINAGE AREA.--268 mi^2.

PERIOD OF RECORD.--October 1955 to current year. Prior to December 1955, monthly discharge only, published in WSP 1730.

REVISED RECORDS.--WDR IA-82-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,269.55 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1953 reached a discharge of about 45,500 ft^3/s, from information by U. S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	11	e7.2	e8.6	e9.7	e7.8	28	30	45	124	44	6.4
2	14	13	e6.2	e8.0	e11	e5.9	26	27	51	105	40	5.7
3	20	18	e5.8	e7.7	e7.9	e7.1	25	25	56	89	37	5.5
4	29	16	e6.7	e9.4	e5.6	e5.9	24	37	50	125	35	5.2
5	26	15	e6.1	e9.2	e7.4	e3.9	23	61	47	118	36	4.9
6	37	15	e8.9	e7.4	e5.2	e5.5	24	83	54	124	33	4.8
7	36	14	e10	e6.5	e2.8	e6.4	16	83	67	125	29	4.8
8	26	14	e8.0	e8.7	e5.9	e6.2	25	75	84	584	28	4.4
9	21	13	e6.6	e8.2	e6.2	e5.8	24	81	91	1,260	26	5.0
10	18	13	e5.3	e6.4	e4.1	e8.6	33	83	91	1,290	24	15
11	16	13	e7.8	e5.3	7.3	e16	57	125	86	650	23	39
12	13	12	e6.3	e5.1	7.6	31	68	162	76	444	20	29
13	11	12	e4.8	e6.1	6.8	18	62	180	68	352	19	15
14	23	12	e4.7	e7.1	14	27	53	209	60	292	18	9.4
15	13	11	e5.9	e6.4	18	55	45	211	53	248	18	7.7
16	11	10	e7.8	e4.1	9.7	127	41	183	48	213	16	6.6
17	10	8.9	8.9	e3.6	10	79	37	153	47	182	16	6.4
18	10	12	e9.6	e5.7	10	52	34	131	107	158	16	12
19	9.1	11	e7.4	e6.8	14	37	41	117	97	141	19	15
20	9.8	11	e6.0	e5.8	37	31	42	105	71	137	17	12
21	8.2	9.8	e4.9	e5.7	29	24	38	97	59	154	17	9.7
22	8.2	9.4	e6.3	e4.9	12	18	35	93	61	127	e13	8.5
23	8.5	9.1	e3.5	e1.9	11	15	31	89	70	114	e12	8.1
24	9.5	8.6	e3.8	e3.6	e6.3	14	33	81	77	99	e10	7.1
25	11	e5.8	e5.2	e3.3	e4.3	12	32	79	145	88	e9.2	6.7
26	12	e5.7	e5.8	e1.7	e7.1	11	27	72	290	76	e9.2	6.2
27	15	e4.5	e7.6	e2.2	e6.8	40	24	65	284	65	e11	6.3
28	15	e6.5	e8.1	e3.2	e7.2	62	22	61	231	60	7.5	6.3
29	15	e8.6	e8.9	e3.6	---	55	19	56	181	56	7.2	6.1
30	15	e6.3	e8.5	e4.0	---	41	26	54	147	52	6.8	6.2
31	14	---	e7.9	e7.5	---	31	---	50	---	48	6.7	---
TOTAL	490.4	329.2	210.5	177.7	283.9	859.1	1,015	2,958	2,894	7,700	623.6	285.0
MEAN	15.8	11.0	6.79	5.73	10.1	27.7	33.8	95.4	96.5	248	20.1	9.50
MAX	37	18	10	9.4	37	127	68	211	290	1,290	44	39
MIN	6.1	4.5	3.5	1.7	2.8	3.9	16	25	45	48	6.7	4.4
AC-FT	973	653	418	352	563	1,700	2,010	5,870	5,740	15,270	1,240	565
CFSM	0.06	0.04	0.03	0.02	0.04	0.10	0.13	0.36	0.36	0.93	0.08	0.04
IN.	0.07	0.05	0.03	0.02	0.04	0.12	0.14	0.41	0.40	1.07	0.09	0.04

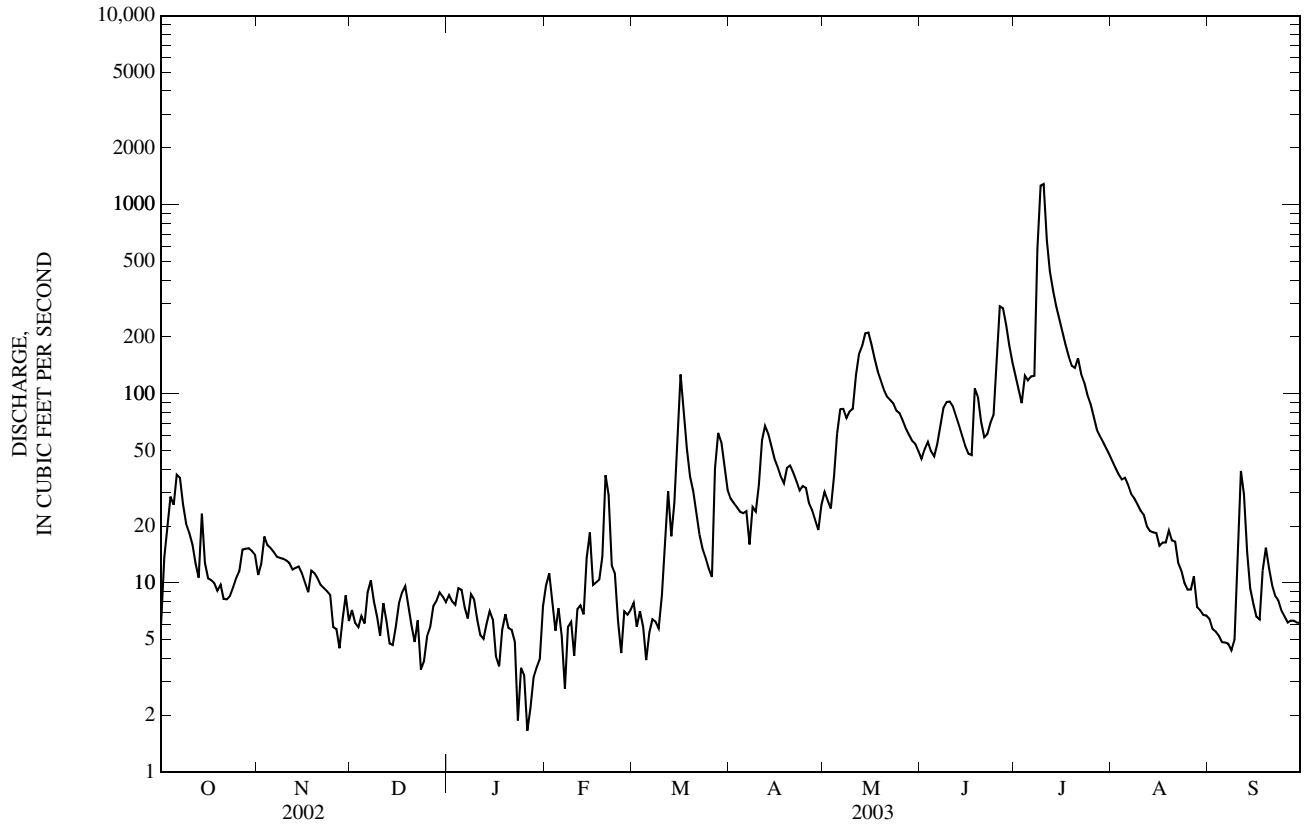
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 2003, BY WATER YEAR (WY)

MEAN	40.8	40.6	26.9	18.1	43.7	166	180	121	179	92.7	43.5	29.2
MAX	234	287	128	109	252	605	906	454	973	878	369	175
(WY)	(1993)	(1980)	(1983)	(1973)	(1971)	(1979)	(1969)	(1995)	(1984)	(1993)	(1995)	(1993)
MIN	0.058	0.30	0.074	0.048	0.15	1.77	3.67	2.92	2.36	3.29	0.37	0.080
(WY)	(1957)	(1959)	(1959)	(1959)	(1977)	(1959)	(1959)	(1968)	(1968)	(1958)	(1968)	(1958)

06600100 FLOYD RIVER AT ALTON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1956 - 2003	
ANNUAL TOTAL	13,785.7		17,826.4			
ANNUAL MEAN	37.8		48.8		81.8	
HIGHEST ANNUAL MEAN					323	1993
LOWEST ANNUAL MEAN					2.66	1968
HIGHEST DAILY MEAN	264	Jun 13	1,290	Jul 10	7,160	Apr 4, 1969
LOWEST DAILY MEAN	3.5	Dec 23	1.7	Jan 26a	0.00	Oct 14, 1956b
ANNUAL SEVEN-DAY MINIMUM	4.0	Sep 8	2.8	Jan 23	0.00	Oct 27, 1956
MAXIMUM PEAK FLOW			1,520	Jul 9	16,300	Jun 20, 1983c
MAXIMUM PEAK STAGE			11.86	Jul 9	18.54	Jun 20, 1983d
ANNUAL RUNOFF (AC-FT)	27,340		35,360		59,260	
ANNUAL RUNOFF (CFSM)	0.14		0.18		0.31	
ANNUAL RUNOFF (INCHES)	1.91		2.47		4.15	
10 PERCENT EXCEEDS	92		115		189	
50 PERCENT EXCEEDS	20		15		21	
90 PERCENT EXCEEDS	5.8		5.7		1.5	

a Ice affected.
b No flow at times in 1956, 1958-59, 1965, 1968, 1977.
c From rating curve extended above 8,500 ft^3/s.
d From floodmark.
e Estimated.



06600500 FLOYD RIVER AT JAMES, IA

LOCATION.--Lat 42°34'36", long 96°18'43", in SE¼ SE¼ sec.30, T.90 N., R.46 W., Plymouth County, Hydrologic Unit 10230002, on left bank at upstream side of bridge on county highway C70, 0.2 mi east of James, 14.3 mi downstream from West Branch Floyd River, and at mile 7.5.

DRAINAGE AREA.--886 mi^2.

PERIOD OF RECORD.--December 1934 to current year.

REVISED RECORDS.--WSP 1240: 1935 (M), 1936, 1937-38 (M), 1942, 1945. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,092.59 ft above NGVD of 1929. Prior to Sept. 11, 1938, June 9 to Nov. 5, 1953, and Oct. 1, 1955, to May 22, 1957, nonrecording gage and May 23, 1957, to Sept. 30, 1970, water-stage recorder at same site at datum 10.0 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage and discharge since 1892, that of June 8, 1953, from information by U. S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	97	e89	e97	e65	e102	186	205	267	575	191	e74
2	75	98	e87	e93	e65	e68	181	202	266	522	178	e71
3	80	104	e85	e86	e61	e76	172	203	268	481	166	69
4	107	100	e90	e91	e50	e44	167	227	264	470	159	68
5	116	102	e85	e90	e51	e29	164	289	269	533	168	68
6	121	100	e88	e84	e42	e42	163	338	261	529	160	66
7	120	97	e91	e75	e39	e52	157	357	257	524	149	63
8	123	97	e87	e84	e48	e45	156	356	269	502	141	63
9	118	98	e81	e71	e45	e32	173	377	322	1,660	134	68
10	113	96	e79	e62	e43	e39	191	396	462	2,730	128	107
11	108	93	e87	e60	e50	e54	223	466	324	2,240	125	154
12	104	94	e83	e62	e49	e115	262	560	304	1,530	119	156
13	98	93	e81	e67	e55	e137	278	585	283	1,180	114	126
14	96	92	e82	e73	e106	e266	279	642	265	989	110	102
15	95	90	e85	e69	e228	e432	274	659	251	845	107	88
16	102	89	e90	e61	e75	331	281	623	241	726	e103	82
17	102	89	e94	e56	e88	272	289	579	235	628	e101	77
18	98	89	e94	e59	e97	226	258	529	249	551	e106	81
19	93	89	e94	e67	e92	195	255	490	276	491	e100	89
20	91	86	e90	e63	e330	189	232	459	292	447	e94	83
21	90	84	e87	e56	e818	172	212	428	267	418	e93	77
22	90	84	e88	e50	e348	155	191	409	259	413	e91	73
23	89	83	e83	e38	e173	143	175	401	261	376	e89	70
24	93	82	e85	e48	e113	135	179	389	470	346	e88	69
25	94	e80	e89	e53	e77	127	188	374	1,050	318	e86	64
26	94	e80	e92	e41	e84	122	180	352	1,270	293	e86	64
27	96	e77	e99	e47	e82	158	172	340	948	271	e91	63
28	104	e83	e100	e54	e93	230	169	328	847	250	e93	61
29	102	e89	e99	e53	---	250	164	312	733	234	e80	60
30	103	e84	e97	e57	---	217	197	300	639	219	e78	60
31	101	---	e94	e59	---	198	---	280	---	205	e76	---
TOTAL	3,093	2,719	2,755	2,026	3,467	4,653	6,168	12,455	12,369	21,496	3,604	2,416
MEAN	99.8	90.6	88.9	65.4	124	150	206	402	412	693	116	80.5
MAX	123	104	100	97	818	432	289	659	1,270	2,730	191	156
MIN	75	77	79	38	39	29	156	202	235	205	76	60
MED	98	90	88	62	76	137	187	377	269	502	106	70
AC-FT	6,130	5,390	5,460	4,020	6,880	9,230	12,230	24,700	24,530	42,640	7,150	4,790
CFSM	0.11	0.10	0.10	0.07	0.14	0.17	0.23	0.45	0.47	0.78	0.13	0.09
IN.	0.13	0.11	0.12	0.09	0.15	0.20	0.26	0.52	0.52	0.90	0.15	0.10

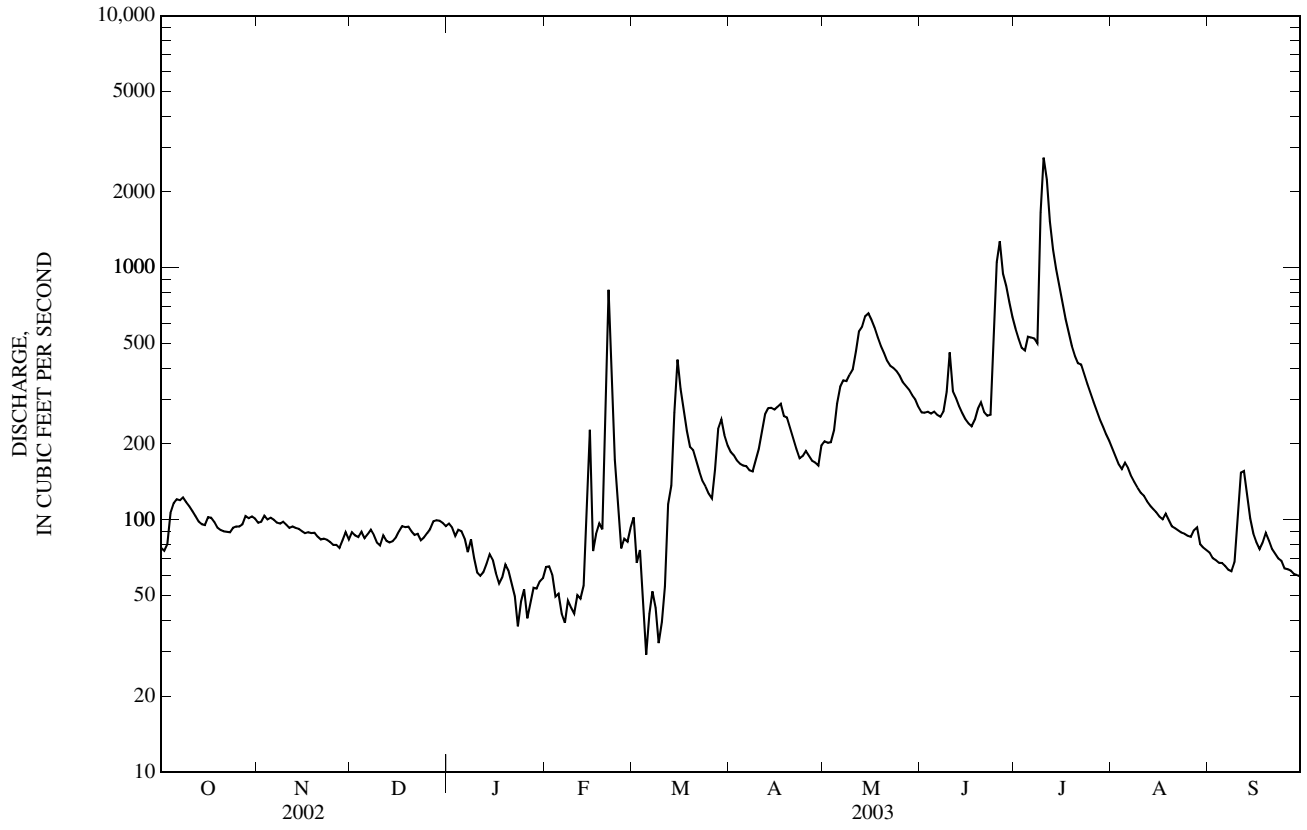
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 2003, BY WATER YEAR (WY)

MEAN	111	110	82.7	59.9	168	528	445	337	525	310	164	135
MAX	617	804	366	359	970	2,080	2,715	1,393	2,897	2,196	1,151	1,353
(WY)	(1993)	(1980)	(1980)	(1973)	(1952)	(1979)	(1969)	(1984)	(1984)	(1993)	(1951)	(1951)
MIN	4.55	4.54	3.05	1.13	1.62	21.5	18.7	15.1	14.4	7.32	6.12	3.40
(WY)	(1959)	(1959)	(1959)	(1977)	(1959)	(1964)	(1959)	(1968)	(1968)	(1936)	(1958)	(1958)

06600500 FLOYD RIVER AT JAMES, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1936 - 2003	
ANNUAL TOTAL	56,580		77,221			
ANNUAL MEAN	155		212		248	
HIGHEST ANNUAL MEAN					958	1983
LOWEST ANNUAL MEAN					19.9	1956
HIGHEST DAILY MEAN	910	Jun 11	2,730	Jul 10	32,400	Jun 8, 1953
LOWEST DAILY MEAN	63	Sep 17	29	Mar 5a	0.90	Jan 10, 1977b
ANNUAL SEVEN-DAY MINIMUM	67	Sep 11	40	Mar 4	0.90	Jan 10, 1977
MAXIMUM PEAK FLOW			2,940	Jul 10	71,500	Jun 8, 1953c
MAXIMUM PEAK STAGE			15.14	Jul 10	35.30	Jun 8, 1953d
ANNUAL RUNOFF (AC-FT)	112,200		153,200		179,500	
ANNUAL RUNOFF (CFSM)	0.17		0.24		0.28	
ANNUAL RUNOFF (INCHES)	2.38		3.24		3.80	
10 PERCENT EXCEEDS	267		464		543	
50 PERCENT EXCEEDS	108		102		85	
90 PERCENT EXCEEDS	82		61		13	

a Ice affected.
b Also Jan. 11-22, 1977.
c From rating curve extended above 16,000 ft^3/s on basis of contracted opening and flow-over-embankment measurement of peak flow.
d From floodmarks, current datum.
e Estimated.



06601200 MISSOURI RIVER AT DECATUR, NE

LOCATION.--Lat 42°00'26", long 96°14'29", in NE¼ SW¼ sec.36, T.24 N., R.10 E., Burt County, Hydrologic Unit 10230001, on right bank 0.1 mi upstream from Iowa Highway 175 bridge at Decatur, and at mile 691.0.

DRAINAGE AREA.--316,200 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,010.00 ft above NGVD of 1929, supplementary adjustment of 1954.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

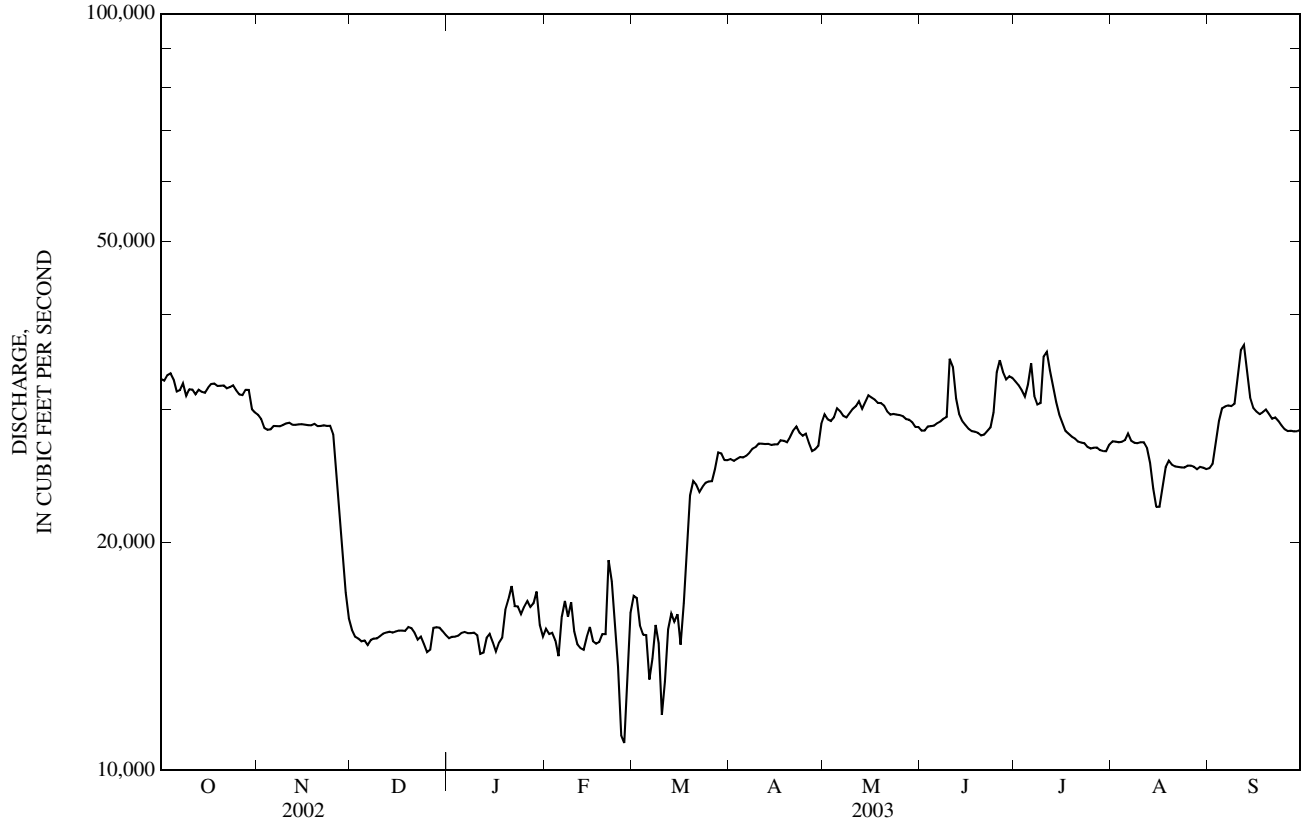
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32,900	29,500	15,300	14,900	15,400	17,000	25,800	29,500	28,100	32,600	27,200	25,100
2	32,700	29,100	15,000	15,000	15,100	16,900	25,600	29,100	28,100	32,300	27,200	25,400
3	33,300	28,300	14,900	15,000	15,200	15,500	25,800	28,900	28,500	31,800	27,100	27,200
4	33,500	28,200	14,800	15,100	14,800	15,100	25,900	29,300	28,500	31,200	27,200	29,000
5	32,800	28,200	14,800	15,200	14,100	15,100	25,900	30,100	28,500	32,300	27,300	30,100
6	31,600	28,500	14,600	15,200	15,900	13,200	26,000	29,800	28,700	34,500	27,900	30,200
7	31,800	28,500	14,900	15,200	16,700	14,000	26,300	29,400	28,900	31,200	27,200	30,300
8	32,500	28,500	14,900	15,200	15,900	15,600	26,600	29,200	29,100	30,400	27,100	30,300
9	31,200	28,600	14,900	15,200	16,700	14,700	26,700	29,600	29,300	30,600	27,000	30,500
10	31,900	28,700	15,000	15,100	15,300	11,800	27,000	30,000	35,000	35,200	27,100	32,900
11	31,800	28,800	15,100	14,200	14,700	13,100	27,000	30,300	34,100	35,700	27,100	35,900
12	31,400	28,600	15,200	14,300	14,500	15,400	27,000	30,700	31,000	33,800	26,600	36,500
13	31,800	28,600	15,200	15,000	14,400	16,100	27,000	30,000	29,600	32,200	25,500	33,400
14	31,600	28,700	15,200	15,100	15,000	15,700	26,900	30,600	28,900	30,700	23,500	31,100
15	31,500	28,700	15,200	14,700	15,500	16,100	26,900	31,300	28,600	29,500	22,300	30,100
16	32,000	28,600	15,300	14,300	14,800	14,600	26,900	31,100	28,300	28,800	22,300	29,800
17	32,400	28,600	15,300	14,700	14,700	16,600	27,300	30,900	28,100	28,100	23,700	29,600
18	32,400	28,600	15,300	15,000	14,800	19,800	27,200	30,600	28,000	27,800	25,100	29,700
19	32,200	28,700	15,400	16,300	15,100	23,100	27,100	30,600	27,900	27,600	25,600	30,000
20	32,200	28,500	15,400	16,800	15,100	24,100	27,600	30,300	27,700	27,400	25,300	29,600
21	32,200	28,500	15,200	17,500	18,900	23,800	28,100	29,800	27,800	27,200	25,200	29,100
22	32,000	28,600	14,900	16,500	17,700	23,300	28,400	29,500	28,100	27,100	25,200	29,300
23	32,100	28,500	15,000	16,500	15,600	23,700	27,900	29,600	28,400	27,000	25,100	29,000
24	32,300	28,500	14,700	16,100	13,700	24,000	27,700	29,500	29,700	26,700	25,100	28,500
25	31,800	27,800	14,300	16,400	11,100	24,100	27,900	29,500	33,600	26,600	25,300	28,200
26	31,400	25,100	14,400	16,700	10,900	24,100	27,100	29,400	34,800	26,700	25,300	28,100
27	31,300	22,500	15,400	16,400	13,200	25,000	26,400	29,100	33,600	26,700	25,200	28,100
28	31,800	19,700	15,400	16,600	16,100	26,300	26,500	29,100	32,800	26,500	25,000	28,000
29	31,800	17,200	15,400	17,200	---	26,200	26,800	28,800	33,100	26,400	25,200	28,000
30	30,000	15,900	15,300	15,600	---	25,700	28,700	28,400	33,000	26,400	25,100	28,200
31	29,700	---	15,100	15,000	---	25,700	---	28,400	---	26,900	25,000	---
TOTAL	989,900	814,800	466,800	482,000	420,900	595,400	808,000	922,400	899,800	917,900	796,000	891,200
MEAN	31,930	27,160	15,060	15,550	15,030	19,210	26,930	29,750	29,990	29,610	25,680	29,710
MAX	33,500	29,500	15,400	17,500	18,900	26,300	28,700	31,300	35,000	35,700	27,900	36,500
MIN	29,700	15,900	14,300	14,200	10,900	11,800	25,600	28,400	27,700	26,400	22,300	25,100
AC-FT	1,963,000	1,616,000	925,900	956,000	834,900	1,181,000	1,603,000	1,830,000	1,785,000	1,821,000	1,579,000	1,768,000
CFSM	0.10	0.09	0.05	0.05	0.05	0.06	0.09	0.09	0.09	0.09	0.08	0.09
IN.	0.12	0.10	0.05	0.06	0.05	0.07	0.10	0.11	0.11	0.11	0.09	0.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2003, BY WATER YEAR (WY)

MEAN	37,560	32,820	21,540	18,810	19,950	25,010	35,950	37,220	37,860	37,940	36,040	37,710
MAX	70,150	72,350	41,350	26,850	32,380	49,450	90,050	80,690	67,970	66,520	66,170	67,290
(WY)	(1998)	(1998)	(1998)	(1998)	(1997)	(1997)	(1997)	(1997)	(1997)	(1997)	(1997)	(1997)
MIN	24,250	10,470	12,070	12,360	12,210	11,580	24,410	26,080	27,010	26,620	25,680	26,750
(WY)	(1993)	(1991)	(1991)	(1990)	(1991)	(1991)	(1991)	(2002)	(2002)	(2002)	(2003)	(1993)

06601200 MISSOURI RIVER AT DECATUR, NE—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1988 - 2003	
ANNUAL TOTAL	8,955,600		9,005,100			
ANNUAL MEAN	24,540		24,670		31,570	
HIGHEST ANNUAL MEAN					57,440	1997
LOWEST ANNUAL MEAN					21,450	1991
HIGHEST DAILY MEAN	36,200	Aug 23	36,500	Sep 12	99,900	Apr 15, 1997
LOWEST DAILY MEAN	14,300	Dec 25	10,900	Feb 26	7,130	Dec 22, 1990
ANNUAL SEVEN-DAY MINIMUM	14,800	Dec 3	13,900	Mar 5	9,660	Dec 12, 1990
MAXIMUM PEAK FLOW			37,700	Sep 12	100,000	Apr 15, 1997
MAXIMUM PEAK STAGE			23.84	Jul 12	32.31	Jul 18, 1996
INSTANTANEOUS LOW FLOW			10,600	Feb 26		
ANNUAL RUNOFF (AC-FT)	17,760,000		17,860,000		22,870,000	
ANNUAL RUNOFF (CFSM)	0.078		0.078		0.10	
ANNUAL RUNOFF (INCHES)	1.05		1.06		1.36	
10 PERCENT EXCEEDS	31,800		31,800		52,200	
50 PERCENT EXCEEDS	26,700		27,100		29,900	
90 PERCENT EXCEEDS	15,400		15,000		14,800	



06602020 WEST FORK DITCH AT HORNICK, IA

LOCATION.--Lat 42°13'37", long 96°04'40", in SW$^1/_4$ SW$^1/_4$ sec.27, T.86 N., R.45 W., Woodbury County, Hydrologic Unit 10230004, on left bank at upstream side of State Highway 141 bridge, 1.0 mi east of Hornick, 9.2 mi upstream from Wolf Creek, and 13.5 mi north of Onawa.

DRAINAGE AREA.--403 mi^2.

PERIOD OF RECORD.-- April 1939 to September 1969 (published as "Holly Springs"), July 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,045.82 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. West Fork ditch is a dredged channel which diverts flow of West Fork Little Sioux River at Hornick 5.5 mi south, then southeast 6.5 mi to a point 1.2 mi west of Kennebec, where Wolf Creek enters from left. From this point, ditch roughly parallels the Little Sioux River and is known as Monona-Harrison ditch. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	101	68	e77	e62	e93	139	184	167	354	125	57
2	88	101	e77	e70	e63	e70	136	181	170	327	120	55
3	92	102	e72	e57	e60	e81	133	174	173	303	115	53
4	122	102	e77	e82	e54	e50	131	251	174	303	111	53
5	153	102	e65	e77	e57	e29	130	326	171	917	113	53
6	152	102	e70	e67	e52	e43	127	339	170	695	116	51
7	134	101	e81	e57	e40	e50	130	332	179	449	108	50
8	123	98	e78	e69	e49	e39	112	304	188	337	103	49
9	120	98	e68	e49	e46	e23	125	295	205	409	99	51
10	116	97	e67	e44	e45	e32	145	288	305	556	95	65
11	113	96	e76	e40	e48	e48	171	297	323	601	92	75
12	108	94	e71	e42	e45	e88	213	319	243	373	88	77
13	105	93	e76	e53	e52	e105	197	320	224	320	85	67
14	102	93	e76	e64	e87	e170	180	338	210	293	83	59
15	100	93	e80	e63	e179	192	170	342	200	273	80	55
16	102	91	83	e60	e67	203	164	320	192	251	77	53
17	103	92	81	e54	e75	140	169	298	187	235	75	53
18	103	91	82	e63	e80	111	153	280	186	222	74	52
19	101	92	83	e68	e80	e105	150	282	182	212	81	57
20	98	89	77	e60	e263	e131	146	264	173	207	77	56
21	96	89	74	e55	e602	e133	141	244	166	212	71	55
22	96	89	70	e47	e320	e121	135	236	174	200	67	55
23	95	89	e60	e33	e166	e107	131	230	177	188	65	54
24	96	89	e64	e43	e102	e103	133	224	1,500	179	63	51
25	97	83	e70	e50	e82	94	142	219	1,060	169	61	49
26	96	78	e78	e30	e75	92	142	209	1,340	161	59	49
27	97	e70	e91	e41	e82	100	135	200	744	155	60	50
28	101	e80	e93	e49	e89	157	131	195	539	148	59	49
29	102	88	e88	e45	---	211	127	189	450	143	57	49
30	102	e75	e84	e51	---	167	151	184	393	137	57	49
31	103	---	e70	e54	---	147	---	176	---	132	57	---
TOTAL	3,303	2,758	2,350	1,714	3,022	3,235	4,389	8,040	10,565	9,461	2,593	1,651
MEAN	107	91.9	75.8	55.3	108	104	146	259	352	305	83.6	55.0
MAX	153	102	93	82	602	211	213	342	1,500	917	125	77
MIN	87	70	60	30	40	23	112	174	166	132	57	49
AC-FT	6,550	5,470	4,660	3,400	5,990	6,420	8,710	15,950	20,960	18,770	5,140	3,270
CFSM	0.26	0.23	0.19	0.14	0.27	0.26	0.36	0.64	0.87	0.76	0.21	0.14
IN.	0.30	0.25	0.22	0.16	0.28	0.30	0.41	0.74	0.98	0.87	0.24	0.15

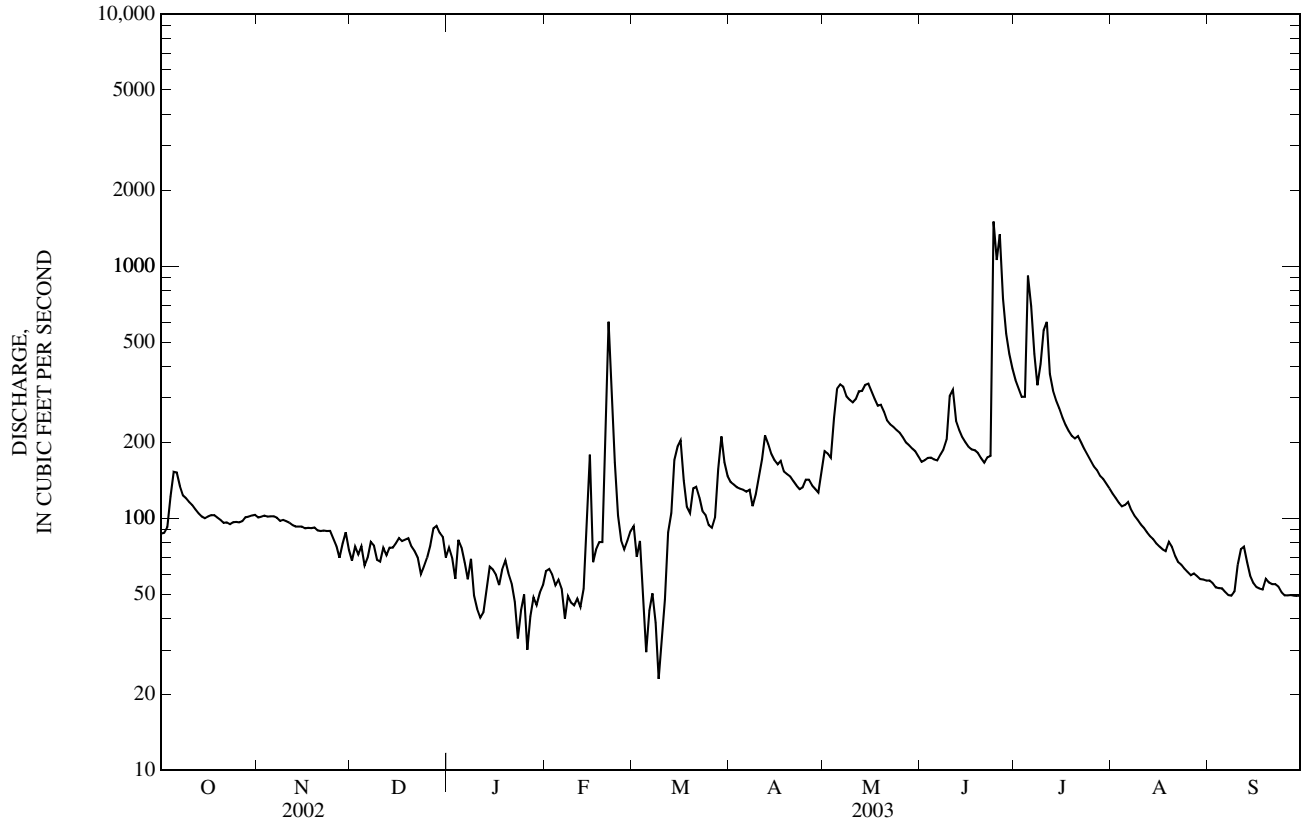
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

MEAN	61.9	56.1	46.1	37.4	106	222	177	158	279	151	104	70.3
MAX	369	281	199	127	522	813	837	585	2,131	561	605	422
(WY)	(1993)	(1980)	(1985)	(1952)	(1994)	(1962)	(1969)	(1983)	(1984)	(1993)	(1951)	(1951)
MIN	2.08	4.06	2.60	2.26	2.41	8.41	9.80	11.5	7.71	11.5	2.92	2.23
(WY)	(1957)	(1959)	(1959)	(1959)	(1940)	(1957)	(1957)	(1943)	(1956)	(1956)	(1956)	(1956)

06602020 WEST FORK DITCH AT HORNICK, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003	
ANNUAL TOTAL	39,485		53,081			
ANNUAL MEAN	108		145		123	
HIGHEST ANNUAL MEAN					367	1984
LOWEST ANNUAL MEAN					9.28	1956
HIGHEST DAILY MEAN	1,450	Jun 11	1,500	Jun 24	9,000	Mar 28, 1962
LOWEST DAILY MEAN	36	Mar 3	23	Mar 9a	0.20	Jul 30, 1956b
ANNUAL SEVEN-DAY MINIMUM	44	Feb 26	38	Mar 5	0.53	Aug 23, 1956
MAXIMUM PEAK FLOW			2,710	Jun 24	12,400	Mar 28, 1962
MAXIMUM PEAK STAGE			17.02	Jun 24	25.87	Jun 22, 1996
ANNUAL RUNOFF (AC-FT)	78,320		105,300		88,850	
ANNUAL RUNOFF (CFSM)	0.27		0.36		0.30	
ANNUAL RUNOFF (INCHES)	3.64		4.90		4.13	
10 PERCENT EXCEEDS	152		294		246	
50 PERCENT EXCEEDS	93		98		50	
90 PERCENT EXCEEDS	60		51		11	

a Ice affected.
b Also Aug. 17, 1956.
e Estimated.



06602400 MONONA-HARRISON DITCH NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°59'30", in NW¼ NE¼ sec.32, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230004, on left bank at upstream side of bridge on county highway E54, 1.0 mi west of gaging station on Little Sioux River near Turin, 4 mi southwest of Turin, 5.2 mi northeast of Blencoe, and 12.5 mi upstream from mouth.

DRAINAGE AREA.--900 mi^2.

PERIOD OF RECORD.--May 1942 to current year. Records for May 1942 to January 1958 not equivalent owing to diversion from Little Sioux River through equalizer ditch 1.5 mi upstream. Records prior to 1950 not equivalent owing to diversion to Little Sioux River through diversion ditch 10.2 mi upstream. REVISED RECORDS: WSP 1440: Drainage area. WSP 1560: Drainage area. WDR IA-95-1: Period of record.

GAGE.--Water-stage recorder. Datum of gage is 1,015.00 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark). May 7, 1942 to Oct. 13, 1953, nonrecording gage and Oct. 14, 1953 to Sept. 30, 1975, recording gage at same site at datum 5.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Monona-Harrison ditch is a dug channel and is a continuation of West Fork ditch, paralleling the Little Sioux River, and discharging into the Missouri River 1.5 mi upstream from the mouth of the Little Sioux River. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	140	167	e111	e123	e112	e174	276	405	304	e562	269	110
2	137	165	131	e119	e125	e137	273	347	308	e552	261	108
3	145	168	e122	e107	e125	e150	265	322	314	e545	253	106
4	230	167	e131	e122	e119	e99	260	503	312	687	247	103
5	278	169	e105	e117	e116	e92	260	1,390	308	1,380	245	103
6	230	172	e111	e114	e116	e99	257	778	308	e2,860	249	102
7	204	171	e132	e107	e108	e111	259	536	311	e2,170	238	101
8	191	170	e127	e112	e113	e102	252	475	320	e1,150	226	100
9	183	168	e116	e101	e109	e95	252	462	338	e786	218	103
10	182	165	e113	e93	e105	e101	286	445	532	e925	216	125
11	180	161	e128	e91	e116	e117	312	489	661	e871	210	175
12	170	160	e123	e94	e116	e169	340	493	433	e605	205	169
13	168	161	e125	e109	e119	e197	336	463	386	e547	199	133
14	169	160	e135	e112	e153	e268	319	467	364	e492	191	105
15	164	160	e137	e105	e273	388	311	470	351	468	184	96
16	166	157	e147	e101	e151	404	303	446	347	443	178	94
17	170	157	e145	e98	e157	325	298	426	346	425	172	95
18	171	158	e151	e102	e185	269	308	413	345	413	167	92
19	163	161	e160	e113	e176	253	296	458	350	404	172	96
20	161	160	e148	e107	e181	257	292	470	343	400	190	98
21	157	154	e137	e103	e807	275	283	401	344	455	166	100
22	155	154	e139	e98	e428	253	276	382	410	402	154	99
23	154	153	e120	e90	e294	242	270	377	414	369	149	96
24	155	152	e126	e98	e213	232	271	369	1,040	350	144	93
25	159	138	e134	e103	e153	231	284	364	2,360	e341	139	90
26	161	121	e140	e90	e151	226	283	349	e1,590	e332	134	89
27	161	e109	e142	e100	e153	230	273	337	e1,100	e332	131	89
28	166	e126	e142	e98	e155	308	263	328	e752	e308	128	87
29	174	139	e136	e101	---	340	261	325	e663	e302	121	87
30	176	e131	e131	e103	---	305	323	319	e599	288	116	87
31	173	---	e115	e106	---	283	---	310	---	278	112	---
TOTAL	5,393	4,654	4,060	3,237	5,129	6,732	8,542	14,119	16,553	20,442	5,784	3,131
MEAN	174	155	131	104	183	217	285	455	552	659	187	104
MAX	278	172	160	123	807	404	340	1,390	2,360	2,860	269	175
MIN	137	109	105	90	105	92	252	310	304	278	112	87
AC-FT	10,700	9,230	8,050	6,420	10,170	13,350	16,940	28,010	32,830	40,550	11,470	6,210
CFSM	0.19	0.17	0.15	0.12	0.20	0.24	0.32	0.51	0.61	0.73	0.21	0.12
IN.	0.22	0.19	0.17	0.13	0.21	0.28	0.35	0.58	0.68	0.84	0.24	0.13

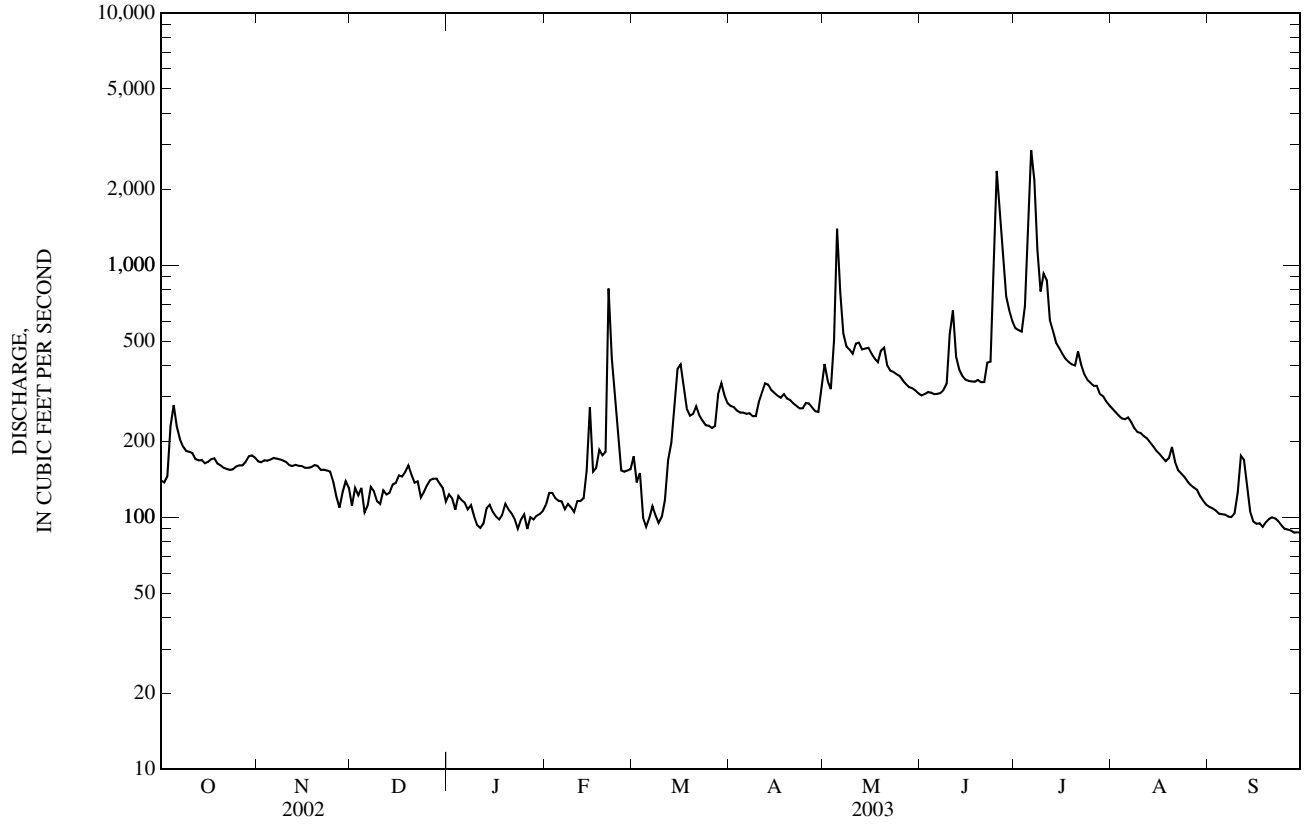
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	151	137	115	95.3	221	474	436	394	589	354	193	144
MAX	831	415	421	398	1,963	1,707	1,588	1,157	3,833	2,107	883	576
(WY)	(1993)	(1980)	(1985)	(1973)	(1971)	(1962)	(1965)	(1995)	(1984)	(1993)	(1996)	(1993)
MIN	16.0	18.0	11.4	10.5	13.9	46.9	41.1	43.7	71.8	46.1	30.6	30.8
(WY)	(1959)	(1959)	(1959)	(1959)	(1959)	(1968)	(1968)	(1968)	(1989)	(1976)	(1976)	(1981)

06602400 MONONA-HARRISON DITCH NEAR TURIN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003a	
ANNUAL TOTAL	72,246		97,776			
ANNUAL MEAN	198		268		275	
HIGHEST ANNUAL MEAN					798	1993
LOWEST ANNUAL MEAN					55.5	1968
HIGHEST DAILY MEAN	2,960	Jun 12	2,860	Jul 6	18,000	Feb 19, 1971
LOWEST DAILY MEAN	54	Jan 28	87	Sep 28c	8.5	Jan 3, 1959b
ANNUAL SEVEN-DAY MINIMUM	84	Jan 28	89	Sep 24	8.5	Jan 3, 1959
MAXIMUM PEAK FLOW			3,190	Jun 25	19,900	Feb 19, 1971
MAXIMUM PEAK STAGE			13.57	Jun 25	28.03	Feb 19, 1971
INSTANTANEOUS LOW FLOW			86	Sep 28d		
ANNUAL RUNOFF (AC-FT)	143,300		193,900		199,300	
ANNUAL RUNOFF (CFSM)	0.22		0.30		0.31	
ANNUAL RUNOFF (INCHES)	2.99		4.04		4.15	
10 PERCENT EXCEEDS	267		462		503	
50 PERCENT EXCEEDS	161		171		131	
90 PERCENT EXCEEDS	104		102		40	

a Post closure of diversion from Little Sioux River.
b Also Jan. 4-11, 1959.
c Also Sept. 29, 30.
d Also Sept. 30.
e Estimated.



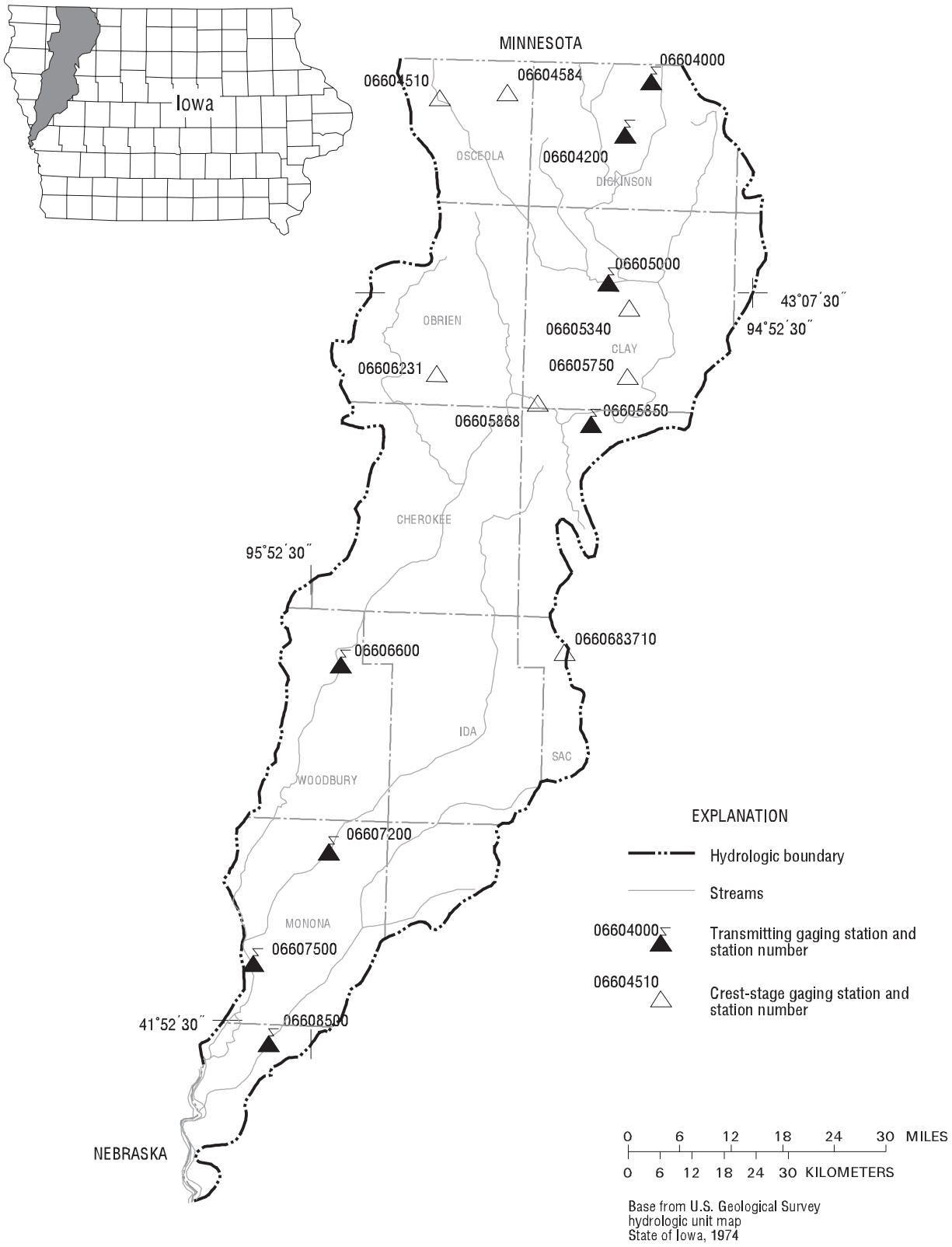


Figure 17. Locations of active continuous-record and crest-stage gaging stations in the Little Sioux River and Soldier River drainage basins.

Gaging Stations

06604000 Spirit Lake near Orleans, IA 384
06604200 West Okoboji Lake at Lakeside Lab near Milford, IA 386
06605000 Ocheyedan River near Spencer, IA 388
06605850 Little Sioux River at Linn Grove, IA 390
06606600 Little Sioux River at Correctionville, IA 392
06607200 Maple River at Mapleton, IA 394
06607500 Little Sioux River near Turin, IA 396
06608500 Soldier River at Pisgah, IA 398

Crest Stage Gaging Stations

06604510 Ocheyedan River near Ocheyedan, IA 463
06604584 Dry Run Creek near Harris, IA 463
06605340 Prairie Creek near Spencer, IA 464
06605750 Willow Creek near Cornell, IA 464
06605868 Little Sioux River Tributary near Peterson, IA 464
06606231 Willow Creek near Calumet, IA 464
0660683710 Halfway Creek at Schaller, IA 464

06604000 SPIRIT LAKE NEAR ORLEANS, IA

LOCATION.--Lat 43°28'11", long 95°07'25", in NE$^1/_4$ NW$^1/_4$ sec.20, T.100N., R.36W., Dickinson County, Hydrologic Unit 10230003, 2.3 mi upstream from lake outlet, and 2.3 mi northwest of Orleans.

DRAINAGE AREA.--75.6 mi^2.

PERIOD OF RECORD.--May 1933 to September 1975 (fragmentary prior to 1951), April 1990 to current year. Prior to October 1949, published as "at Orleans".

GAGE.--Water-stage recorder. Datum of gage is 1,387.25 ft above NGVD of 1929, 90.0 ft above Iowa Lake Survey datum, and 14.2 ft below crest of spillway. Prior to July 6, 1950, non-recording gage or water-stage recorder at various sites near outlet, all at present datum.

REMARKS.--A reliable record of stage was obtained for the year. Lake formed by concrete dam with ungated spillway at elevation 1,401.4 ft. above sea level. Dam constructed in 1969. A previous outlet works had been constructed in 1944. Lake is used for conservation and recreation. U.S. Geological Survey satellite data collection platform at station.

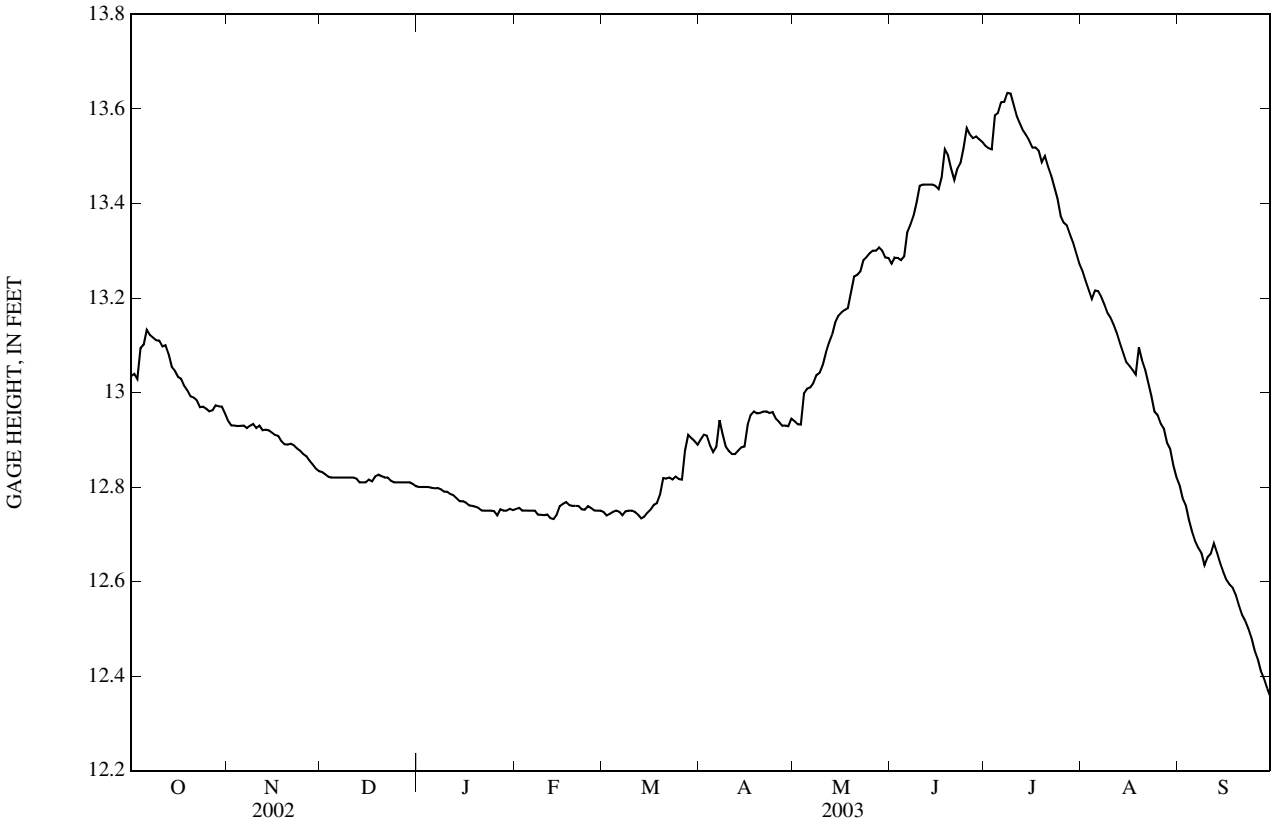
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 18.79 ft. July 17-20, 1993; minimum observed, 6.75 ft. Oct. 20, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 13.66 ft. July 8; minimum, 12.35 ft. Sept. 30.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.03	12.94	12.83	12.80	12.75	12.75	12.90	12.94	13.27	13.52	13.26	12.80
2	13.04	12.93	12.83	12.80	12.76	12.74	12.91	12.93	13.29	13.52	13.24	12.78
3	13.03	12.93	12.82	12.80	12.75	12.74	12.91	12.93	13.28	13.51	13.22	12.76
4	13.09	12.93	12.82	12.80	12.75	12.75	12.89	13.00	13.28	13.59	13.20	12.73
5	13.10	12.93	12.82	12.80	12.75	12.75	12.87	13.01	13.29	13.59	13.22	12.71
6	13.13	12.93	12.82	12.80	12.75	12.75	12.89	13.01	13.34	13.61	13.21	12.69
7	13.12	12.92	12.82	12.80	12.75	12.74	12.94	13.02	13.35	13.61	13.20	12.67
8	13.12	12.93	12.82	12.80	12.74	12.75	12.91	13.04	13.37	13.63	13.19	12.66
9	13.11	12.93	12.82	12.79	12.74	12.75	12.89	13.04	13.40	13.63	13.17	12.63
10	13.11	12.92	12.82	12.79	12.74	12.75	12.88	13.06	13.44	13.61	13.16	12.65
11	13.10	12.93	12.82	12.79	12.74	12.75	12.87	13.08	13.44	13.58	13.14	12.66
12	13.10	12.92	12.82	12.78	12.73	12.74	12.87	13.11	13.44	13.57	13.13	12.68
13	13.08	12.92	12.81	12.78	12.73	12.73	12.88	13.12	13.44	13.55	13.10	12.66
14	13.05	12.92	12.81	12.77	12.74	12.74	12.88	13.15	13.44	13.54	13.08	12.64
15	13.05	12.92	12.81	12.77	12.76	12.75	12.89	13.16	13.44	13.53	13.06	12.62
16	13.03	12.91	12.82	12.77	12.76	12.75	12.93	13.17	13.43	13.52	13.06	12.60
17	13.03	12.91	12.81	12.76	12.77	12.76	12.95	13.17	13.45	13.52	13.05	12.59
18	13.01	12.90	12.82	12.76	12.76	12.77	12.96	13.18	13.51	13.51	13.04	12.59
19	13.00	12.89	12.83	12.76	12.76	12.78	12.96	13.21	13.50	13.49	13.10	12.57
20	12.99	12.89	12.82	12.76	12.76	12.82	12.96	13.25	13.47	13.50	13.07	12.55
21	12.99	12.89	12.82	12.75	12.76	12.82	12.96	13.25	13.45	13.48	13.05	12.53
22	12.98	12.89	12.82	12.75	12.75	12.82	12.96	13.26	13.47	13.46	13.02	12.52
23	12.97	12.88	12.81	12.75	12.75	12.82	12.96	13.28	13.49	13.43	12.99	12.50
24	12.97	12.88	12.81	12.75	12.76	12.82	12.96	13.29	13.52	13.41	12.96	12.48
25	12.97	12.87	12.81	12.75	12.76	12.82	12.94	13.29	13.56	13.37	12.95	12.45
26	12.96	12.87	12.81	12.74	12.75	12.82	12.94	13.30	13.55	13.36	12.93	12.44
27	12.96	12.86	12.81	12.75	12.75	12.88	12.93	13.30	13.54	13.35	12.92	12.41
28	12.97	12.85	12.81	12.75	12.75	12.91	12.93	13.31	13.54	13.34	12.89	12.39
29	12.97	12.84	12.81	12.75	---	12.90	12.93	13.30	13.54	13.32	12.88	12.37
30	12.97	12.83	12.81	12.75	---	12.90	12.94	13.29	13.53	13.30	12.85	12.36
31	12.96	---	12.80	12.75	---	12.89	---	13.28	---	13.27	12.82	---
MEAN	13.03	12.90	12.82	12.77	12.75	12.79	12.92	13.15	13.44	13.49	13.07	12.59
MAX	13.13	12.94	12.83	12.80	12.77	12.91	12.96	13.31	13.56	13.63	13.26	12.80
MIN	12.96	12.83	12.80	12.74	12.73	12.73	12.87	12.93	13.27	13.27	12.82	12.36

06604000 SPIRIT LAKE NEAR ORLEANS, IA—Continued



06604200 WEST OKOBOJI LAKE AT LAKESIDE LABORATORY NEAR MILFORD, IA

LOCATION.--Lat 43°22'43", long 95°10'52", in NE¼ SW¼ sec.23, T.99 N., R.37 W., Dickinson County, Hydrologic Unit 10230003, at pumping station of Lakeside Laboratory on west shore, 2.3 mi upstream from lake outlet, and 3.8 mi northwest of Milford.

DRAINAGE AREA.--125 mi^2.

PERIOD OF RECORD.--May 1933 to current year. Published as "Okoboji Lake at Arnold's Park" 1933-37 and as "Okoboji Lake at Lakeside Laboratory near Milford" 1937-66.

GAGE.--Water-stage recorder. Datum of gage is 1,391.76 ft above NGVD of 1929, 94.51 ft above Iowa Lake Survey datum. Prior to June 17, 1938, nonrecording gage at State Pier at Arnolds Park at same datum.

REMARKS.--A reliable record of stage was obtained for the year. Lake formed by concrete dam with ungated spillway at elevation 1,395.8 ft above sea level. Lake is used for conservation and recreation. Area of lake is approximately 3,900 acres. U.S. Geological Survey satellite data collection platform at station.

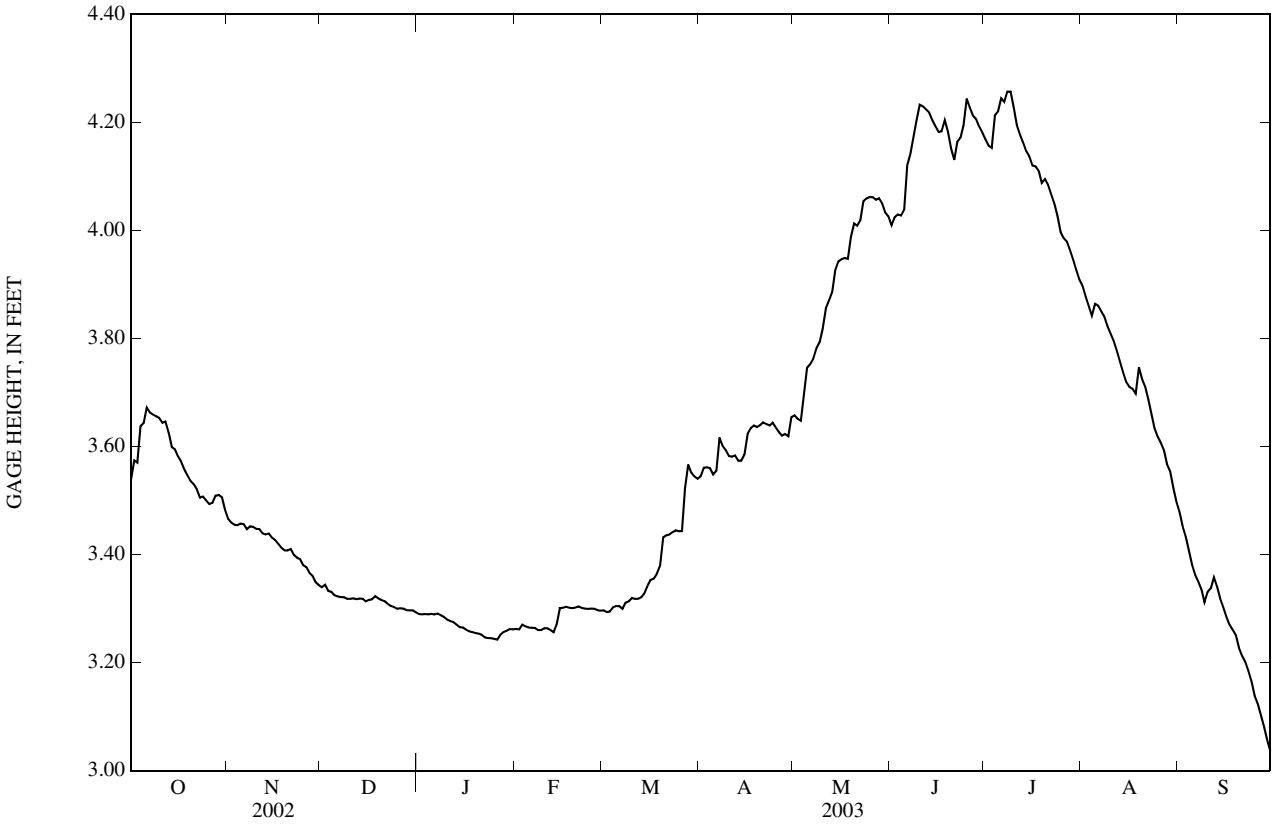
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 8.70 ft July 17, 1993; minimum observed, 0.20 ft Sept. 20, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 4.31 ft July 9; minimum, 3.02 ft Sept. 30.

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.54	3.47	3.34	3.29	3.26	3.30	3.54	3.66	4.01	4.17	3.90	3.48
2	3.57	3.46	3.34	3.29	3.26	3.29	3.56	3.65	4.02	4.16	3.88	3.45
3	3.57	3.46	3.33	3.29	3.27	3.29	3.56	3.65	4.03	4.15	3.86	3.43
4	3.64	3.45	3.33	3.29	3.27	3.30	3.56	3.70	4.03	4.21	3.84	3.41
5	3.64	3.46	3.32	3.29	3.27	3.30	3.55	3.75	4.04	4.22	3.86	3.38
6	3.67	3.46	3.32	3.29	3.26	3.30	3.56	3.75	4.12	4.24	3.86	3.36
7	3.66	3.45	3.32	3.29	3.26	3.30	3.62	3.76	4.14	4.24	3.85	3.35
8	3.66	3.45	3.32	3.29	3.26	3.31	3.60	3.78	4.17	4.26	3.84	3.34
9	3.66	3.45	3.32	3.28	3.26	3.31	3.59	3.79	4.21	4.26	3.82	3.31
10	3.65	3.45	3.32	3.28	3.26	3.32	3.58	3.82	4.23	4.23	3.81	3.33
11	3.64	3.45	3.32	3.28	3.26	3.32	3.58	3.86	4.23	4.20	3.80	3.34
12	3.65	3.44	3.32	3.27	3.26	3.32	3.58	3.87	4.22	4.18	3.78	3.36
13	3.63	3.44	3.32	3.27	3.26	3.32	3.57	3.89	4.22	4.16	3.76	3.34
14	3.60	3.44	3.32	3.27	3.27	3.33	3.57	3.93	4.20	4.15	3.74	3.32
15	3.60	3.43	3.31	3.27	3.30	3.34	3.59	3.94	4.19	4.14	3.72	3.30
16	3.58	3.43	3.32	3.26	3.30	3.35	3.62	3.95	4.18	4.12	3.71	3.29
17	3.57	3.42	3.32	3.26	3.30	3.36	3.63	3.95	4.18	4.12	3.71	3.27
18	3.56	3.41	3.32	3.26	3.30	3.36	3.64	3.95	4.20	4.11	3.70	3.26
19	3.55	3.41	3.32	3.25	3.30	3.38	3.64	3.99	4.18	4.09	3.75	3.25
20	3.54	3.41	3.32	3.25	3.30	3.43	3.64	4.01	4.15	4.09	3.73	3.23
21	3.53	3.41	3.31	3.25	3.30	3.44	3.64	4.01	4.13	4.08	3.71	3.21
22	3.52	3.40	3.31	3.25	3.30	3.44	3.64	4.02	4.16	4.07	3.69	3.20
23	3.51	3.39	3.30	3.25	3.30	3.44	3.64	4.05	4.17	4.05	3.66	3.19
24	3.51	3.39	3.30	3.25	3.30	3.44	3.64	4.06	4.20	4.03	3.63	3.17
25	3.50	3.38	3.30	3.24	3.30	3.44	3.63	4.06	4.24	4.00	3.62	3.14
26	3.49	3.38	3.30	3.24	3.30	3.44	3.63	4.06	4.23	3.99	3.61	3.12
27	3.50	3.37	3.30	3.25	3.30	3.52	3.62	4.06	4.21	3.98	3.59	3.10
28	3.51	3.36	3.30	3.26	3.30	3.57	3.62	4.06	4.21	3.96	3.57	3.08
29	3.51	3.35	3.30	3.26	---	3.55	3.62	4.05	4.19	3.95	3.55	3.06
30	3.51	3.34	3.30	3.26	---	3.54	3.65	4.03	4.18	3.93	3.52	3.04
31	3.48	---	3.29	3.26	---	3.54	---	4.03	---	3.91	3.50	---
MEAN	3.57	3.42	3.31	3.27	3.28	3.38	3.60	3.91	4.16	4.11	3.73	3.27
MAX	3.67	3.47	3.34	3.29	3.30	3.57	3.65	4.06	4.24	4.26	3.90	3.48
MIN	3.48	3.34	3.29	3.24	3.26	3.29	3.54	3.65	4.01	3.91	3.50	3.04

06604200 WEST OKOBOJI LAKE AT LAKESIDE LABORATORY NEAR MILFORD, IA—Continued



06605000 OCHEYEDAN RIVER NEAR SPENCER, IA

LOCATION.--Lat 43°07'44", long 95°12'37", in SW¼ SW¼ sec.15, T.96N., R.37W., Clay County, Hydrologic Unit 10230003, on right bank 5 ft downstream from bridge on county highway M38, 3.4 mi west by southwest of Spencer, and at mile 4.1.

DRAINAGE AREA.--426 mi^2.

PERIOD OF RECORD.--October 1977 to current year. Occasional low-flow measurements, water years 1957-61, 1964, 1966-68, 1970, 1971, 1974-77.

GAGE.--Water-stage recorder. Datum of gage is 1,311.66 ft above NGVD of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1953 reached a stage of 12.89 ft, discharge, 26,000 ft^3/s on basis of contracted-opening measurement of peak flow.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	41	e16	e30	e7.6	e10	63	94	188	258	41	18
2	15	38	e22	e28	e9.8	e5.4	61	94	191	226	39	18
3	20	32	e21	e24	e13	e8.3	61	93	194	198	38	17
4	27	30	e28	e29	e16	e4.8	62	106	190	195	34	16
5	35	30	e23	e28	e17	e3.0	65	177	185	200	37	14
6	44	30	e26	e25	e15	e9.1	64	221	191	207	37	13
7	61	29	e29	e17	e13	e6.6	85	217	208	212	34	12
8	55	29	e28	e34	e17	e5.7	76	201	217	271	32	11
9	48	29	e21	e19	e19	e3.7	68	202	234	456	31	10
10	45	29	e17	e11	e17	e5.5	79	204	259	459	31	13
11	42	27	e22	e9.5	e18	e12	110	266	260	362	30	13
12	40	27	e20	e11	e17	e9.9	112	379	248	283	29	14
13	36	27	e17	e16	e18	e9.0	103	362	234	232	29	12
14	35	27	e17	e21	e16	e25	96	365	217	195	34	11
15	35	27	e18	e17	e8.9	e51	91	357	205	167	33	10
16	34	28	e20	e13	e6.7	e197	94	325	195	143	32	9.9
17	34	30	e26	e11	e8.1	e67	95	301	189	128	31	9.7
18	33	27	e29	e8.9	e13	e54	93	280	190	116	30	10
19	32	26	e26	e12	e12	e48	97	286	185	104	31	10
20	31	25	e17	e7.4	e17	61	102	326	174	99	28	9.7
21	31	26	e13	e5.8	e20	52	108	329	168	96	26	9.8
22	30	25	e14	e4.2	e17	46	105	296	171	87	25	10
23	29	25	e11	e3.2	e13	43	101	284	184	79	24	9.5
24	30	e23	e10	e4.6	e9.4	42	98	273	229	73	23	9.2
25	31	e22	e16	e5.6	e5.9	40	94	258	438	67	23	8.6
26	31	e17	e20	e3.2	e6.7	38	89	240	679	63	22	9.2
27	31	e20	e22	e3.6	e7.3	60	86	228	572	56	21	8.9
28	32	e23	e21	e3.9	e9.4	134	84	220	442	52	20	8.4
29	33	e29	e22	e4.0	---	98	81	212	358	49	20	8.3
30	34	e23	e20	e4.6	---	75	87	208	298	46	19	8.0
31	33	---	e18	e5.6	---	67	---	197	---	43	18	---
TOTAL	1,060	821	630	420.1	367.8	1,291.0	2,610	7,601	7,693	5,222	902	341.2
MEAN	34.2	27.4	20.3	13.6	13.1	41.6	87.0	245	256	168	29.1	11.4
MAX	61	41	29	34	20	197	112	379	679	459	41	18
MIN	13	17	10	3.2	5.9	3.0	61	93	168	43	18	8.0
AC-FT	2,100	1,630	1,250	833	730	2,560	5,180	15,080	15,260	10,360	1,790	677
CFSM	0.08	0.06	0.05	0.03	0.03	0.10	0.20	0.58	0.60	0.40	0.07	0.03
IN.	0.09	0.07	0.06	0.04	0.03	0.11	0.23	0.66	0.67	0.46	0.08	0.03

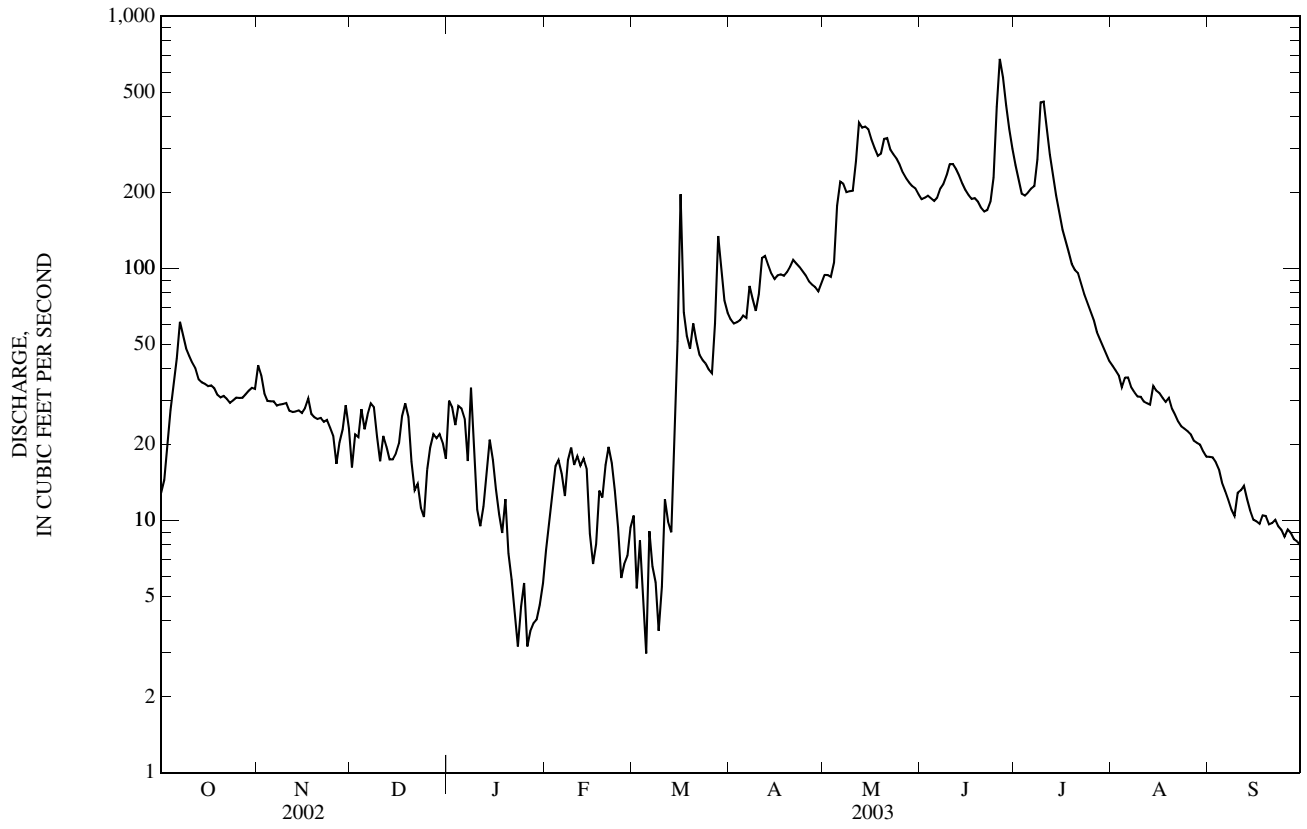
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	114	129	72.6	41.2	76.6	315	470	372	475	300	130	118
MAX	492	796	305	180	402	1,019	1,462	912	1,973	2,243	706	597
(WY)	(1983)	(1980)	(1983)	(1983)	(1983)	(1983)	(1983)	(1993)	(1993)	(1993)	(1993)	(1979)
MIN	8.12	8.11	1.91	0.51	0.000	14.0	19.7	54.9	33.8	33.4	15.3	9.85
(WY)	(2001)	(1990)	(1990)	(1979)	(1979)	(1990)	(2000)	(1981)	(1989)	(1989)	(1989)	(2000)

06605000 OCHEYEDAN RIVER NEAR SPENCER, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1978 - 2003	
ANNUAL TOTAL	20,336		28,959.1			
ANNUAL MEAN	55.7		79.3		218	
HIGHEST ANNUAL MEAN					763	1993
LOWEST ANNUAL MEAN					33.4	1989
HIGHEST DAILY MEAN	736	Jun 12	679	Jun 26	5,620	Jul 1, 1993
LOWEST DAILY MEAN	10	Dec 24	3.0	Mar 5a	0.00	Jan 24, 1979b
ANNUAL SEVEN-DAY MINIMUM	14	Sep 23	4.0	Jan 23	0.00	Jan 24, 1979
MAXIMUM PEAK FLOW			707	Jun 26	6,450	Jun 21, 1983
MAXIMUM PEAK STAGE			5.32	Jun 26	11.28	Jul 1, 1993
INSTANTANEOUS LOW FLOW			3.0	Mar 5		
ANNUAL RUNOFF (AC-FT)	40,340		57,440		157,900	
ANNUAL RUNOFF (CFSM)	0.13		0.19		0.51	
ANNUAL RUNOFF (INCHES)	1.78		2.53		6.95	
10 PERCENT EXCEEDS	107		227		532	
50 PERCENT EXCEEDS	36		30		82	
90 PERCENT EXCEEDS	18		9.2		12	

a Ice affected.
b Also Jan. 25 to Mar. 9, 1979, Dec. 22, 1989 to Jan. 5, 1990.
e Estimated.



06605850 LITTLE SIOUX RIVER AT LINN GROVE, IA

LOCATION.--Lat 42°53'45", long 95°14'35", in SW¼ SE¼ SW¼ sec.5, T.93 N., R.37 W., Buena Vista County, Hydrologic Unit 10230003, on right bank 500 ft upstream of concrete dam, 1300 ft upstream of bridge on County Highway M36, in Linn Grove, and at mile 122.5.

DRAINAGE AREA.--1,548 mi^2.

PERIOD OF RECORD.--October 1972 to current year.

REVISED RECORDS.--WDR IA-80-1: 1978-79.

GAGE.--Water-stage recorder. Datum of gage is 1,223.60 ft above NGVD of 1929. Oct. 1, 1972 to Nov. 17, 1999, water-stage recorder, 0.25 mi downstream, below concrete dam, at current datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1953, gage height 20.96 ft; discharge, 22,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	145	72	87	20	37	315	348	643	1,820	191	54
2	76	135	e82	84	24	e33	296	372	622	1,510	179	53
3	89	137	e81	e75	30	37	281	376	601	1,280	169	49
4	171	154	e93	77	32	e35	276	397	578	1,160	157	46
5	311	155	e81	e74	33	e31	277	647	558	1,120	158	44
6	328	148	85	e71	e26	e40	277	990	581	1,170	171	43
7	323	140	90	e75	e23	34	273	1,060	651	1,200	161	42
8	337	137	88	84	e33	e32	235	983	802	1,310	143	37
9	309	134	83	e67	e32	e28	290	922	886	1,780	135	37
10	272	134	82	e54	e30	e30	302	898	930	2,090	129	38
11	244	137	85	e45	e35	33	378	973	987	2,150	130	44
12	223	131	89	e44	e33	30	492	1,250	986	1,860	117	60
13	202	127	92	e49	35	30	507	1,420	952	1,490	109	67
14	186	126	92	57	34	46	484	1,430	868	1,220	103	61
15	180	126	95	48	e26	68	458	1,400	791	1,020	100	55
16	174	124	97	41	e22	122	450	1,350	710	856	101	47
17	169	118	101	39	e24	245	454	1,230	651	738	98	39
18	166	115	107	39	33	413	450	1,110	629	656	92	38
19	162	119	114	41	e32	401	441	1,030	760	586	92	40
20	153	122	116	35	41	256	451	1,040	791	536	93	42
21	147	122	105	35	49	245	451	1,130	708	506	87	45
22	142	118	87	e28	e42	212	449	1,190	656	483	82	43
23	138	114	76	e18	e36	181	438	1,160	652	439	77	37
24	137	111	e69	21	e29	168	425	1,120	1,250	398	72	37
25	137	90	e70	18	e26	152	404	1,090	2,260	359	70	35
26	141	77	e74	e12	e29	140	383	1,030	2,880	324	69	33
27	140	87	77	e13	e30	160	360	946	3,180	294	66	32
28	139	e95	77	15	e34	310	336	876	3,150	270	60	33
29	146	e109	80	16	---	496	317	808	2,880	248	57	33
30	148	89	e78	16	---	441	325	760	2,370	226	56	33
31	149	---	e75	18	---	361	---	694	---	207	55	---
TOTAL	5,709	3,676	2,693	1,396	873	4,847	11,275	30,030	34,963	29,306	3,379	1,297
MEAN	184	123	86.9	45.0	31.2	156	376	969	1,165	945	109	43.2
MAX	337	155	116	87	49	496	507	1,430	3,180	2,150	191	67
MIN	70	77	69	12	20	28	235	348	558	207	55	32
AC-FT	11,320	7,290	5,340	2,770	1,730	9,610	22,360	59,560	69,350	58,130	6,700	2,570
CFSM	0.12	0.08	0.06	0.03	0.02	0.10	0.24	0.63	0.75	0.61	0.07	0.03
IN.	0.14	0.09	0.06	0.03	0.02	0.12	0.27	0.72	0.84	0.70	0.08	0.03

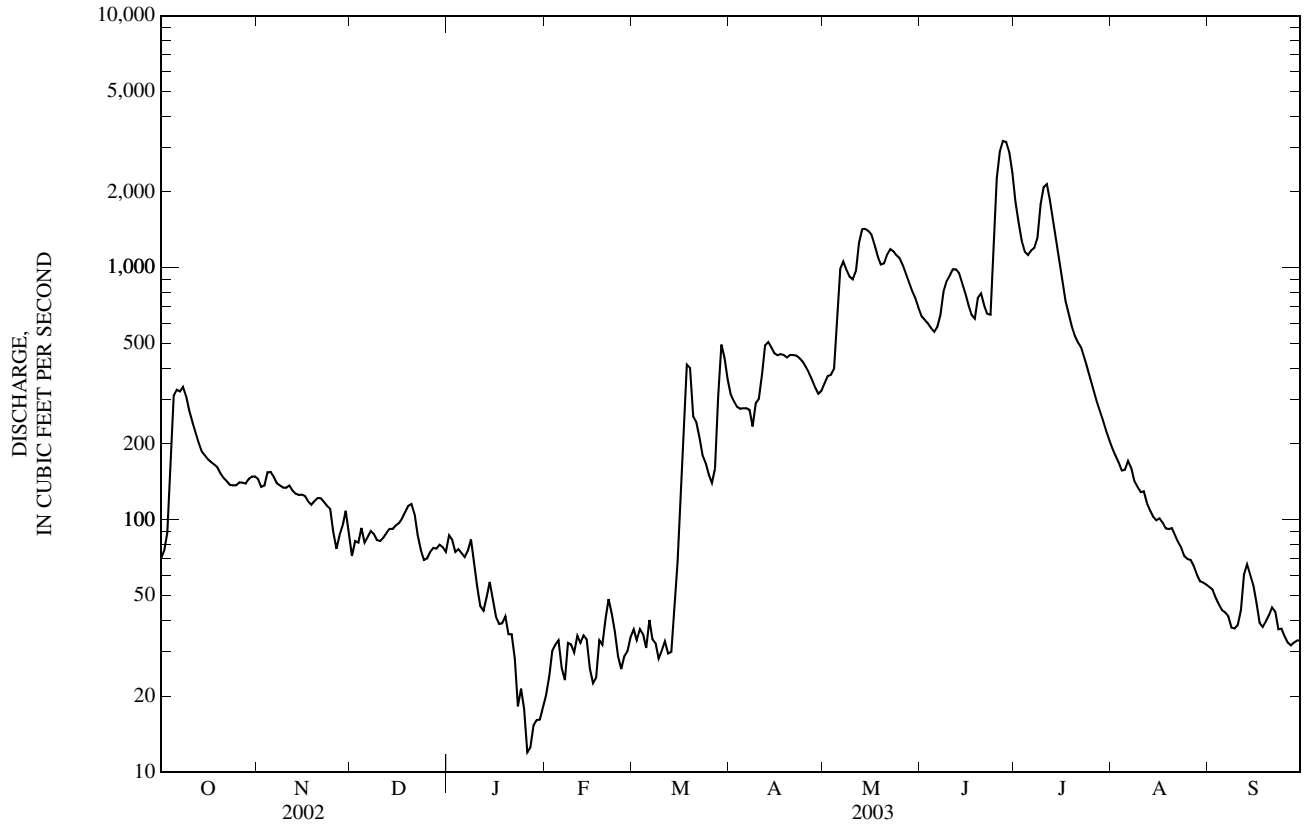
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 2003, BY WATER YEAR (WY)

MEAN	383	418	260	170	273	1,034	1,602	1,291	1,509	1,026	454	373
MAX	2,070	2,050	1,122	859	1,161	3,894	4,952	3,233	6,898	7,905	2,906	2,171
(WY)	(1983)	(1980)	(1983)	(1983)	(1983)	(1983)	(1983)	(1993)	(1993)	(1993)	(1993)	(1993)
MIN	21.3	22.0	6.08	3.12	5.92	75.9	74.9	69.4	60.3	36.3	26.4	22.7
(WY)	(1977)	(1977)	(1990)	(1977)	(1977)	(1990)	(2000)	(1977)	(1977)	(1977)	(1976)	(1976)

06605850 LITTLE SIOUX RIVER AT LINN GROVE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1973 - 2003	
ANNUAL TOTAL	81,168		129,444			
ANNUAL MEAN	222		355		734	
HIGHEST ANNUAL MEAN					2,763	1993
LOWEST ANNUAL MEAN					56.3	1977
HIGHEST DAILY MEAN	1,700	Jun 14	3,180	Jun 27	15,000	Jul 2, 1993
LOWEST DAILY MEAN	40	Aug 3	12	Jan 26a	0.70	Feb 4, 1977
ANNUAL SEVEN-DAY MINIMUM	55	Jul 29	15	Jan 25	1.1	Jan 31, 1977
MAXIMUM PEAK FLOW			3,290	Jun 28	16,100	Jul 2, 1993
MAXIMUM PEAK STAGE			18.30	Jun 28	20.63	Jul 2, 1993
ANNUAL RUNOFF (AC-FT)	161,000		256,800		531,400	
ANNUAL RUNOFF (CFSM)	0.14		0.23		0.47	
ANNUAL RUNOFF (INCHES)	1.95		3.11		6.44	
10 PERCENT EXCEEDS	418		1,030		1,950	
50 PERCENT EXCEEDS	141		135		295	
90 PERCENT EXCEEDS	78		33		42	

a Ice affected.
e Estimated.



06606600 LITTLE SIOUX RIVER AT CORRECTIONVILLE, IA

LOCATION.--Lat 42°28'20", long 95°47'49", in NE¼ NW¼ sec.1, T.88 N., R.43 W., Woodbury County, Hydrologic Unit 10230003 on right bank 50 ft upstream from bridge on State Highway 31, 0.3 mi upstream from Bacon Creek, 0.5 mi west of Correctionville, 0.8 mi downstream from Pierson Creek, and at mile 56.0.

DRAINAGE AREA.--2,500 mi^2.

PERIOD OF RECORD.--May 1918 to July 1925, October 1928 to July 1932, June 1936 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 856: 1919. WSP 1240: 1924-25, 1931, 1932 (M), 1937, 1945 (M), 1947 (M), 1949 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,096.49 ft above NGVD of 1929. May 28, 1918, to July 1, 1925 and Oct. 29, 1928 to July 15, 1929, nonrecording gage 0.2 mi downstream at datum 1.25 ft lower. July 16, 1929, to July 2, 1932, and June 15, 1936, to Nov. 7, 1938, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23 or 24, 1891, reached a stage of 29.34 ft, present datum, from levels to floodmark by U.S. Soil Conservation Service (discharge not determined).

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	186	340	172	201	95	166	798	799	1,210	e4,000	704	190
2	187	337	225	192	106	e143	725	778	1,160	e3,500	651	185
3	194	341	216	187	e117	157	676	782	1,160	3,010	602	179
4	419	346	235	202	114	154	646	840	1,120	2,730	564	171
5	463	341	190	198	110	e126	613	1,020	1,080	4,340	556	165
6	487	345	207	191	e109	e137	595	1,160	1,060	3,450	528	162
7	579	351	245	192	e96	144	595	1,500	1,070	3,070	508	157
8	596	346	238	205	103	142	589	1,700	1,160	3,050	488	150
9	589	339	220	198	105	e100	595	1,710	1,230	5,380	468	149
10	580	330	219	161	e101	e105	613	1,630	1,670	7,770	445	177
11	558	317	225	e146	105	140	711	1,640	1,510	7,060	437	190
12	519	308	223	e140	102	171	789	1,680	1,490	5,000	425	202
13	482	308	221	e142	101	188	866	1,870	1,480	4,010	418	180
14	450	306	222	e147	137	249	934	2,160	1,440	3,320	407	166
15	429	298	230	133	221	350	947	2,280	1,370	2,850	392	160
16	413	294	239	e115	e138	571	921	2,280	1,290	2,510	359	157
17	410	291	242	e103	e133	719	883	2,170	1,220	2,250	331	150
18	403	290	256	e107	139	737	854	2,030	1,170	2,020	318	145
19	385	292	261	111	149	712	841	1,950	1,230	1,840	324	145
20	368	288	243	110	462	800	833	1,870	1,210	1,690	297	141
21	361	283	231	106	954	738	817	1,760	1,220	1,700	281	146
22	348	282	210	e95	554	595	796	1,740	1,250	1,550	270	150
23	334	282	183	e78	e390	542	780	1,790	1,240	1,420	263	145
24	330	279	190	82	e249	503	784	1,800	e5,200	1,310	255	140
25	335	249	197	80	e234	462	807	1,740	e6,200	1,200	244	130
26	335	205	204	e73	208	430	783	1,670	7,660	1,110	239	128
27	335	184	212	74	184	448	747	1,600	7,020	1,010	233	127
28	350	210	210	77	171	558	716	1,520	6,010	941	228	124
29	360	279	205	80	---	646	682	1,430	5,480	878	214	121
30	356	231	201	85	---	751	733	1,360	4,970	822	199	117
31	345	---	187	88	---	834	---	1,280	---	764	192	---
TOTAL	12,486	8,892	6,759	4,099	5,687	12,518	22,669	49,539	71,580	85,555	11,840	4,649
MEAN	403	296	218	132	203	404	756	1,598	2,386	2,760	382	155
MAX	596	351	261	205	954	834	947	2,280	7,660	7,770	704	202
MIN	186	184	172	73	95	100	589	778	1,060	764	192	117
AC-FT	24,770	17,640	13,410	8,130	11,280	24,830	44,960	98,260	142,000	169,700	23,480	9,220
CFSM	0.16	0.12	0.09	0.05	0.08	0.16	0.30	0.64	0.95	1.10	0.15	0.06
IN.	0.19	0.13	0.10	0.06	0.08	0.19	0.34	0.74	1.07	1.27	0.18	0.07

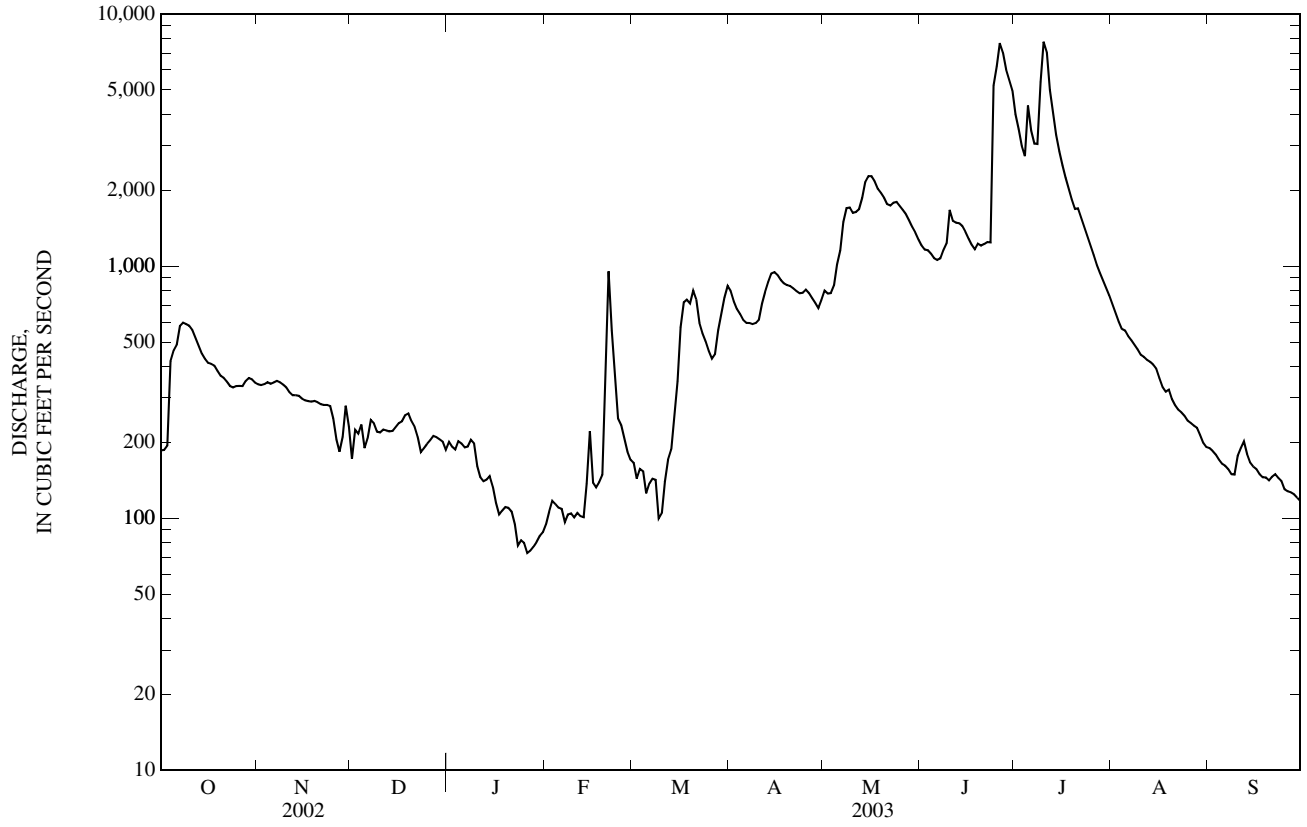
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 2003, BY WATER YEAR (WY)

MEAN	427	426	295	214	455	1,437	1,899	1,429	1,808	1,239	600	494
MAX	2,994	3,079	1,698	1,323	2,708	7,328	8,677	5,002	10,110	11,600	4,469	3,671
(WY)	(1983)	(1980)	(1983)	(1983)	(1971)	(1983)	(1983)	(1993)	(1993)	(1993)	(1993)	(1938)
MIN	8.33	25.3	15.1	8.31	7.08	53.5	61.9	57.3	58.1	43.4	15.0	14.4
(WY)	(1957)	(1959)	(1959)	(1959)	(1959)	(1931)	(1931)	(1931)	(1956)	(1956)	(1931)	(1958)

06606600 LITTLE SIOUX RIVER AT CORRECTIONVILLE, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1919 - 2003	
ANNUAL TOTAL	171,785		296,273			
ANNUAL MEAN	471		812		905	
HIGHEST ANNUAL MEAN					4,304	1993
LOWEST ANNUAL MEAN					53.7	1931
HIGHEST DAILY MEAN	2,160	Jun 16	7,770	Jul 10	27,900	Apr 7, 1965
LOWEST DAILY MEAN	99	Aug 3	73	Jan 26a	2.6	Jul 17, 1936b
ANNUAL SEVEN-DAY MINIMUM	119	Jul 28	78	Jan 23	4.6	Oct 4, 1956
MAXIMUM PEAK FLOW			8,320	Jun 24	29,800	Apr 7, 1965
MAXIMUM PEAK STAGE			15.51	Jun 24	25.86	Apr 7, 1965
ANNUAL RUNOFF (AC-FT)	340,700		587,700		655,900	
ANNUAL RUNOFF (CFSM)	0.19		0.32		0.36	
ANNUAL RUNOFF (INCHES)	2.56		4.41		4.92	
10 PERCENT EXCEEDS	874		1,770		2,240	
50 PERCENT EXCEEDS	346		346		376	
90 PERCENT EXCEEDS	190		128		56	

a Ice affected.
b Also July 25, 1956, caused by construction of dam upstream.
e Estimated.



06607200 MAPLE RIVER AT MAPLETON, IA

LOCATION.--Lat 42°09'25", long 95°48'35", in SE¼ SE¼ sec.23, T.85 N., R.43 W., Monona County, Hydrologic Unit 10230005, on right bank at downstream side of bridge on State Highway 175, 1.0 mi downstream from Simmons Creek, 1.1 mi southwest of intersection of State Highways 175 and 141 in Mapleton, 2.1 mi upstream from McCleery Creek, and 16.0 mi upstream from mouth.

DRAINAGE AREA.--669 mi^2.

PERIOD OF RECORD.--October 1941 to current year.

REVISED RECORDS.--WSP 1310: 1942 (M), 1946 (M), 1948 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,080.86 ft above NGVD of 1929. See WSP 1730 for history of changes prior to Sept. 20, 1956; Prior to Apr. 27, 2000, at datum 5.0 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	157	90	e105	e89	e182	143	379	379	768	417	125
2	115	155	89	e103	e94	e149	138	473	389	690	399	121
3	116	162	e83	e94	e95	e158	134	458	404	619	382	117
4	356	156	87	e103	e92	e123	129	554	391	570	368	112
5	452	154	e83	e100	e96	e101	124	1,070	380	1,130	364	109
6	404	153	e93	e95	e88	e112	119	1,190	369	3,150	358	105
7	318	151	e95	e86	e74	107	119	1,020	383	2,150	347	100
8	262	149	e93	e95	e88	e100	113	893	385	1,350	334	97
9	236	151	e84	e83	e85	e87	106	878	382	2,590	323	101
10	220	150	e81	e69	e82	e88	129	815	459	6,740	313	113
11	203	146	e90	e66	e85	e94	197	807	490	4,410	305	117
12	192	141	e86	e69	e84	95	283	802	457	2,040	292	115
13	184	142	e85	e76	e90	107	299	802	428	1,440	279	108
14	175	143	e91	e82	e215	153	266	803	401	1,240	268	99
15	177	144	e99	e80	e437	264	238	810	374	1,100	260	96
16	177	142	e110	e74	e227	393	224	764	354	982	255	95
17	177	140	e118	e68	e231	256	220	706	347	902	250	91
18	175	142	e120	e69	239	191	211	657	338	840	251	89
19	172	141	e116	e80	233	164	208	699	330	784	284	91
20	167	141	e108	e78	507	164	208	663	314	741	e255	90
21	164	140	e99	e72	1,170	162	197	602	301	730	e232	125
22	156	138	95	e66	e668	151	186	575	302	713	e210	126
23	153	137	95	e57	e420	138	175	556	293	681	e188	112
24	153	134	97	e66	e260	126	181	534	437	608	170	101
25	159	119	e100	e70	e194	118	192	518	913	572	162	92
26	160	e119	e106	e59	e176	110	185	491	2,580	537	155	92
27	157	e114	e114	e65	e177	118	180	465	3,380	624	148	91
28	166	e120	e116	e72	e178	141	175	450	1,790	513	142	88
29	170	e130	e116	e73	---	161	168	435	1,090	482	136	89
30	170	e114	e113	e77	---	168	243	425	881	457	130	89
31	164	---	e103	e80	---	151	---	399	---	436	127	---
TOTAL	6,140	4,225	3,055	2,432	6,474	4,632	5,490	20,693	19,721	40,589	8,104	3,096
MEAN	198	141	98.5	78.5	231	149	183	668	657	1,309	261	103
MAX	452	162	120	105	1,170	393	299	1,190	3,380	6,740	417	126
MIN	90	114	81	57	74	87	106	379	293	436	127	88
AC-FT	12,180	8,380	6,060	4,820	12,840	9,190	10,890	41,040	39,120	80,510	16,070	6,140
CFSM	0.30	0.21	0.15	0.12	0.35	0.22	0.27	1.00	0.98	1.96	0.39	0.15
IN.	0.34	0.23	0.17	0.14	0.36	0.26	0.31	1.15	1.10	2.26	0.45	0.17

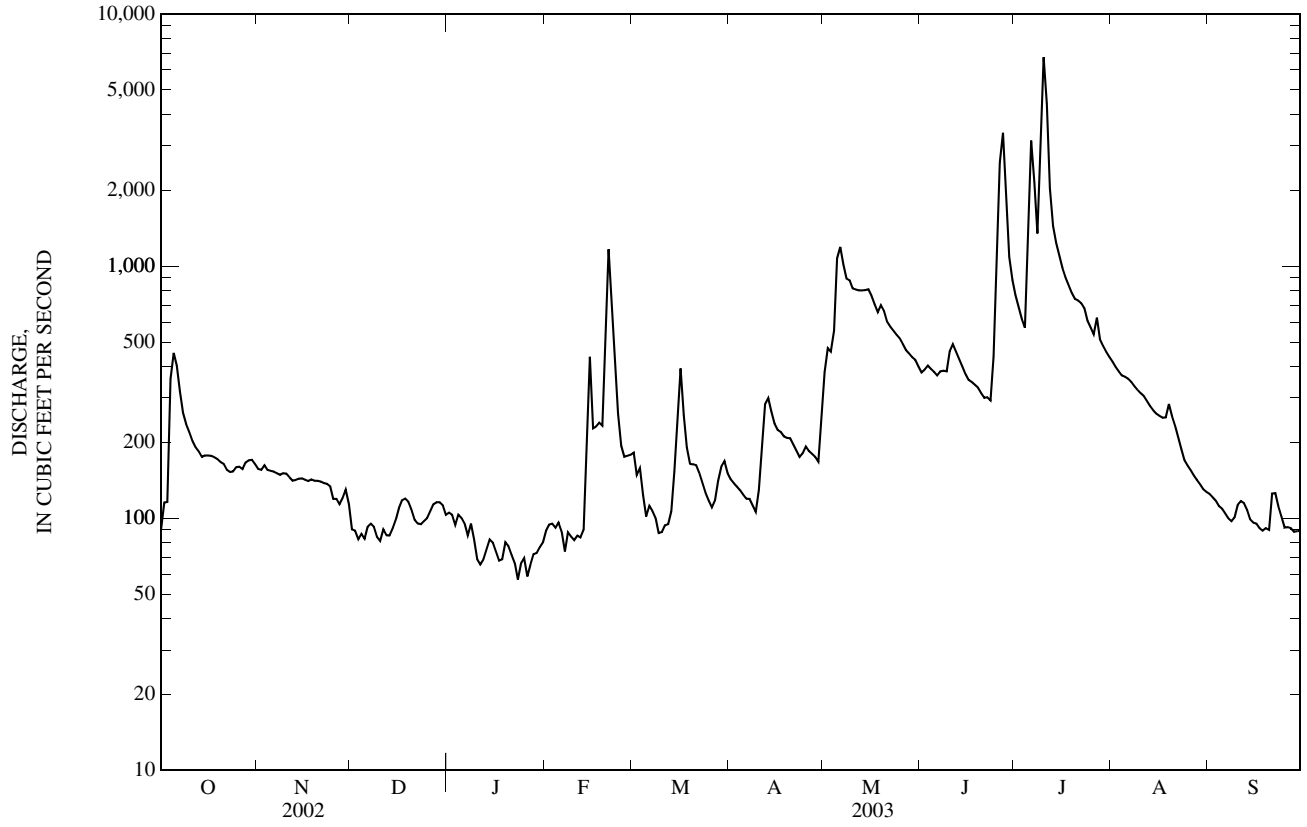
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2003, BY WATER YEAR (WY)

MEAN	157	145	116	96.1	223	477	406	403	632	378	254	177
MAX	634	506	548	330	1,016	1,588	1,889	1,345	2,856	1,588	1,230	1,034
(WY)	(1983)	(1993)	(1985)	(1983)	(1971)	(1983)	(1983)	(1984)	(1984)	(1993)	(1951)	(1951)
MIN	9.36	14.6	5.74	3.25	3.64	25.6	19.9	35.9	48.5	33.3	12.6	5.48
(WY)	(1957)	(1959)	(1959)	(1959)	(1959)	(1957)	(1957)	(1968)	(1955)	(1956)	(1956)	(1956)

06607200 MAPLE RIVER AT MAPLETON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1942 - 2003	
ANNUAL TOTAL	69,251		124,651			
ANNUAL MEAN	190		342		289	
HIGHEST ANNUAL MEAN					983	1983
LOWEST ANNUAL MEAN					24.5	1956
HIGHEST DAILY MEAN	1,080	Jun 12	6,740	Jul 10	14,400	Jun 21, 1983
LOWEST DAILY MEAN	54	Jan 18	57	Jan 23a	0.00	Sep 21, 1945b
ANNUAL SEVEN-DAY MINIMUM	71	Jan 18	65	Jan 21	2.6	Feb 14, 1959
MAXIMUM PEAK FLOW			7,520	Jul 10	20,800	Sep 12, 1978
MAXIMUM PEAK STAGE			15.32	Jul 10	22.10	Jun 12, 1950
ANNUAL RUNOFF (AC-FT)	137,400		247,200		209,100	
ANNUAL RUNOFF (CFSM)	0.28		0.51		0.43	
ANNUAL RUNOFF (INCHES)	3.85		6.93		5.86	
10 PERCENT EXCEEDS	358		734		611	
50 PERCENT EXCEEDS	144		162		140	
90 PERCENT EXCEEDS	85		87		30	

a Ice affected.
b Also Sept. 22, 1945, caused by temporary dam upstream.
e Estimated.



06607500 LITTLE SIOUX RIVER NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°58'21", in NW¼ NE¼ sec.33, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230003, on left bank on downstream side of bridge on county highway E54, 1.0 mi east of gaging station on Monona-Harrison Ditch near Turin, 2.5 mi downstream from Maple River, 3.8 mi south of Turin, 6.2 mi northeast of Blencoe, and at mile 13.5.

DRAINAGE AREA.--3,526 mi^2.

PERIOD OF RECORD.--May 1942 to September 1957, January 1958 to current year. June 1942 to January 1958 at site 1,200 ft east on old river channel; records not equivalent owing to diversion into Monona-Harrison Ditch through equalizer ditch 1.5 mi upstream 1923 to 1958, and diversion with Monona-Harrison Ditch through diversion ditch 8.3 miles upstream since 1958.
REVISED RECORDS: WSP 1440: Drainage area. WSP 1560: Drainage area. WDR IA-95-1: Period of record.

GAGE.--Water-stage recorder. Datum of gage is 1,019.85 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark). Prior to July 15, 1958, nonrecording gages near present site at different datums. July 15 to Sept. 3, 1958, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	328	519	e358	e414	e281	e384	964	1,190	e1,700	5,300	1,460	e343
2	316	517	e437	e403	e293	e321	893	1,320	e1,650	4,690	1,390	e341
3	349	530	427	e391	e297	e322	798	1,320	1,710	4,060	1,310	e321
4	642	528	e463	e407	e291	e284	727	1,510	1,710	e3,750	1,220	332
5	945	534	e413	e414	e289	e297	712	2,080	1,650	e4,000	1,190	326
6	891	533	e415	e403	e283	e343	695	2,520	1,580	e5,900	1,150	324
7	853	545	e467	e400	e279	e353	728	2,490	1,570	e5,000	1,110	300
8	906	552	e461	e423	e272	e330	704	2,630	1,660	e4,600	1,060	293
9	875	537	e447	e425	e276	e303	695	2,760	1,850	4,610	1,020	296
10	869	500	e438	e419	e286	e327	752	2,660	2,110	12,400	978	335
11	858	487	e449	e387	e276	e417	808	2,580	2,240	13,200	932	342
12	764	482	e426	e360	e273	e512	979	2,580	2,200	8,280	880	361
13	717	481	e426	e350	e282	e574	1,130	2,640	2,180	6,100	834	342
14	702	473	e423	e358	e347	e779	1,240	2,890	2,140	5,160	807	321
15	640	465	e426	e344	e496	e936	1,260	3,090	2,080	4,440	823	312
16	611	462	e437	e327	e399	942	1,200	3,100	1,970	3,890	786	314
17	620	460	e447	e299	e326	996	1,120	3,030	1,820	3,490	730	320
18	621	459	488	e307	e346	954	1,090	2,900	1,690	3,170	693	278
19	578	459	477	e315	e358	903	1,060	2,830	1,620	2,900	676	269
20	577	457	419	e317	e705	900	1,050	2,770	1,670	2,720	674	277
21	549	437	e410	e309	e1,400	991	1,040	2,600	1,630	2,700	605	298
22	516	439	e399	e299	e1,650	865	1,020	2,490	1,840	2,650	562	333
23	500	440	e381	e272	e936	740	982	2,470	1,870	2,480	554	323
24	494	414	e407	e283	e547	649	969	2,450	3,090	2,310	541	289
25	506	419	e423	e279	e529	600	1,020	2,400	5,510	2,170	511	266
26	523	418	e432	e260	e471	548	1,020	2,290	8,240	2,060	487	263
27	510	373	e439	e256	e424	530	989	2,190	10,100	2,080	461	248
28	535	349	e444	e258	e415	559	940	2,120	8,070	1,910	453	245
29	543	448	e432	e262	---	659	891	2,000	6,440	1,740	e420	239
30	549	406	e423	e270	---	790	1,010	e1,900	5,820	1,640	e381	240
31	525	---	e405	e274	---	913	---	e1,800	---	1,540	e358	---
TOTAL	19,412	14,123	13,339	10,485	13,027	19,021	28,486	73,600	89,410	130,940	25,056	9,091
MEAN	626	471	430	338	465	614	950	2,374	2,980	4,224	808	303
MAX	945	552	488	425	1,650	996	1,260	3,100	10,100	13,200	1,460	361
MIN	316	349	358	256	272	284	695	1,190	1,570	1,540	358	239
AC-FT	38,500	28,010	26,460	20,800	25,840	37,730	56,500	146,000	177,300	259,700	49,700	18,030
CFSM	0.18	0.13	0.12	0.10	0.13	0.17	0.27	0.67	0.85	1.20	0.23	0.09
IN.	0.20	0.15	0.14	0.11	0.14	0.20	0.30	0.78	0.94	1.38	0.26	0.10

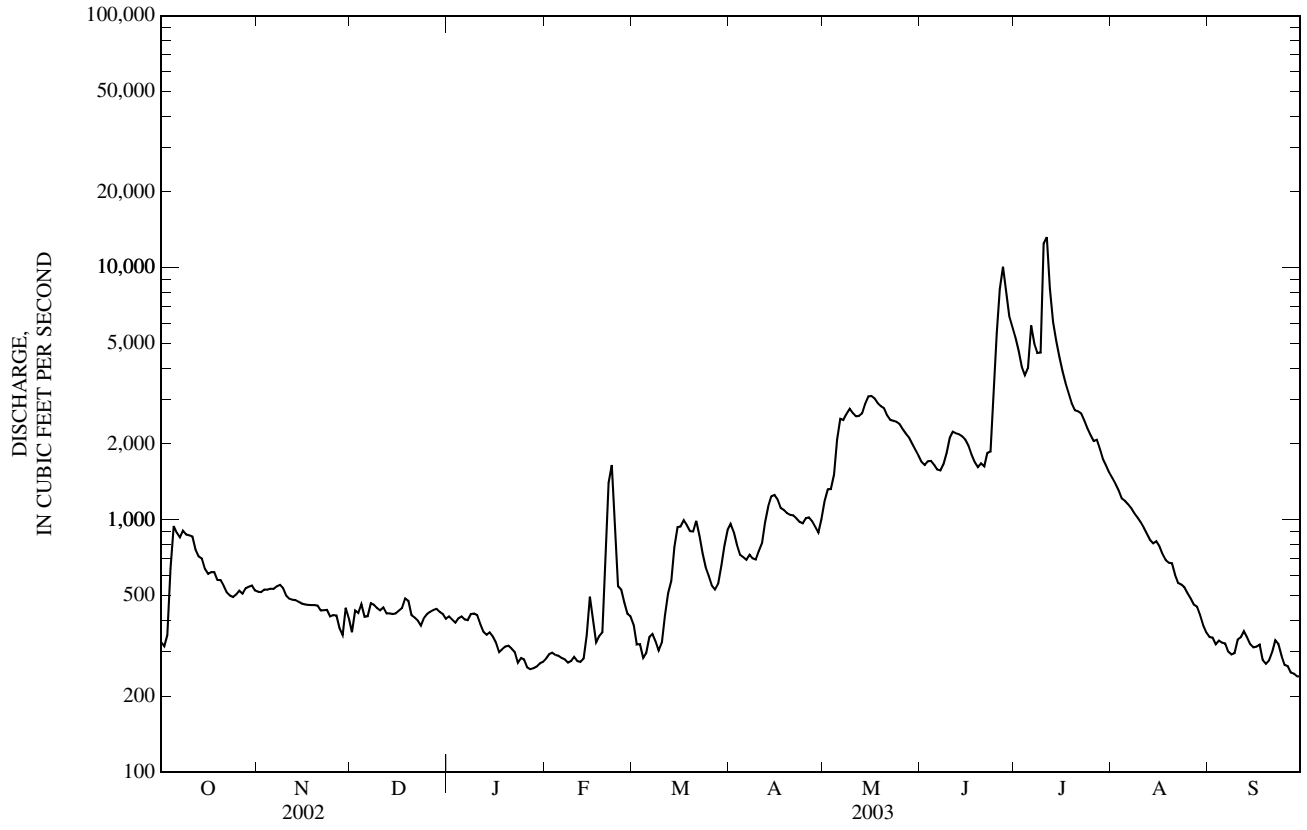
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	791	799	641	470	819	2,281	3,102	2,418	2,957	2,070	1,043	825
MAX	3,625	3,612	2,424	2,250	3,353	9,054	10,790	7,938	15,080	13,110	5,181	3,980
(WY)	(1983)	(1980)	(1983)	(1992)	(1971)	(1983)	(1965)	(1986)	(1984)	(1993)	(1993)	(1993)
MIN	37.5	48.0	31.2	18.5	25.1	171	157	118	315	181	140	90.2
(WY)	(1959)	(1959)	(1959)	(1977)	(1959)	(1964)	(1968)	(1968)	(1968)	(1968)	(1976)	(1976)

06607500 LITTLE SIOUX RIVER NEAR TURIN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003a	
ANNUAL TOTAL	268,100		445,990			
ANNUAL MEAN	735		1,222		1,519	
HIGHEST ANNUAL MEAN					5,261	1993
LOWEST ANNUAL MEAN					167	1968
HIGHEST DAILY MEAN	3,060	Jun 12	13,200	Jul 11	28,700	Jun 22, 1996
LOWEST DAILY MEAN	254	Aug 3	239	Sep 29	17	Jan 18, 1977b
ANNUAL SEVEN-DAY MINIMUM	292	Jul 29	256	Sep 24	17	Jan 27, 1977
MAXIMUM PEAK FLOW			16,200	Jul 10	32,000	Jun 22, 1996
MAXIMUM PEAK STAGE			21.60	Jul 10	27.44	Feb 19, 1971c
INSTANTANEOUS LOW FLOW			221	Sep 30		
ANNUAL RUNOFF (AC-FT)	531,800		884,600		1,100,000	
ANNUAL RUNOFF (CFSM)	0.21		0.35		0.43	
ANNUAL RUNOFF (INCHES)	2.83		4.71		5.85	
10 PERCENT EXCEEDS	1,330		2,680		3,670	
50 PERCENT EXCEEDS	537		554		758	
90 PERCENT EXCEEDS	342		298		154	

a Post closure of diversion to Monona-Harrison Ditch.
b Also Jan. 19, 20, Jan. 28 to Feb. 1, 1977.
c Ice affected.
e Estimated.



06608500 SOLDIER RIVER AT PISGAH, IA

LOCATION.--Lat 41°49'50", long 95°55'52", in NW¼ NE¼ sec.14, T.81 N., R.44 W., Harrison County, Hydrologic Unit 10230001, on right bank at upstream side of bridge on county highway F20, at west edge of Pisgah, 0.4 mi downstream from Cobb Creek, 0.5 mi upstream from Mogger Ditch, and 13.1 mi upstream from mouth.

DRAINAGE AREA.--407 mi^2.

PERIOD OF RECORD.--March 1940 to current year.

REVISED RECORDS.--WSP 956: 1940 (M). WSP 1240: 1940, 1941 (M), 1947. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,036.53 ft above NGVD of 1929. Prior to Oct. 11, 1954, nonrecording gage at same site and datum with supplementary water-stage recorder operating above 8.2 ft gage height Mar. 2, 1946 to Sept. 24, 1953. Prior to Feb. 1954, on left bank at downstream side of bridge. Prior to June 21, 1989, at site 100 ft downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	60	e59	e65	e56	e79	51	268	100	97	116	57
2	106	58	e53	e56	e56	e59	51	180	121	93	109	58
3	87	60	e52	e48	e50	e67	52	149	139	87	104	54
4	443	59	e63	e59	e42	e29	60	444	119	79	100	52
5	251	60	e51	e56	e39	e26	62	658	117	106	102	50
6	126	59	e59	e47	e29	e37	62	314	113	1,730	100	49
7	98	57	e64	e40	e23	e47	75	242	115	491	93	51
8	87	56	e60	e59	e31	e42	71	215	117	302	89	46
9	79	57	e47	e33	e29	e30	75	234	131	443	86	45
10	77	55	e42	e19	e28	e43	88	203	723	449	83	50
11	74	54	e51	e18	e35	e109	89	221	241	256	85	57
12	68	52	e46	e23	e35	e205	89	190	170	212	80	60
13	66	55	e45	e32	e38	e236	80	189	155	193	79	51
14	64	56	e49	e46	e306	326	73	234	142	179	78	43
15	62	57	e57	e44	907	351	70	177	131	168	78	40
16	63	55	e69	e38	e128	220	71	156	125	154	76	39
17	66	57	72	e35	e136	151	72	145	121	147	74	37
18	65	58	72	e47	147	119	69	136	121	145	74	35
19	59	57	71	e56	144	107	73	164	116	136	92	37
20	57	57	64	e49	588	116	81	199	108	136	91	38
21	56	56	e57	e42	1,080	108	75	143	100	185	76	40
22	54	56	e57	e37	285	81	67	137	123	132	70	70
23	56	57	e49	e24	e129	74	66	142	132	126	69	58
24	64	e53	e52	e35	e83	68	73	138	112	121	67	45
25	63	e49	e54	e39	e58	63	80	135	127	110	65	40
26	61	e47	e59	e22	e63	60	70	125	115	99	62	39
27	58	e43	e68	e33	e66	63	58	116	105	127	61	39
28	69	e58	e69	e40	e74	65	53	114	197	431	60	39
29	68	e67	e69	e39	---	56	56	118	116	165	58	39
30	67	e52	e68	e44	---	52	616	116	100	134	57	40
31	68	---	e61	e46	---	52	---	103	---	123	56	---
TOTAL	2,737	1,677	1,809	1,271	4,685	3,141	2,628	6,105	4,452	7,356	2,490	1,398
MEAN	88.3	55.9	58.4	41.0	167	101	87.6	197	148	237	80.3	46.6
MAX	443	67	72	65	1,080	351	616	658	723	1,730	116	70
MIN	54	43	42	18	23	26	51	103	100	79	56	35
AC-FT	5,430	3,330	3,590	2,520	9,290	6,230	5,210	12,110	8,830	14,590	4,940	2,770
CFSM	0.22	0.14	0.14	0.10	0.41	0.25	0.22	0.48	0.36	0.58	0.20	0.11
IN.	0.25	0.15	0.17	0.12	0.43	0.29	0.24	0.56	0.41	0.67	0.23	0.13

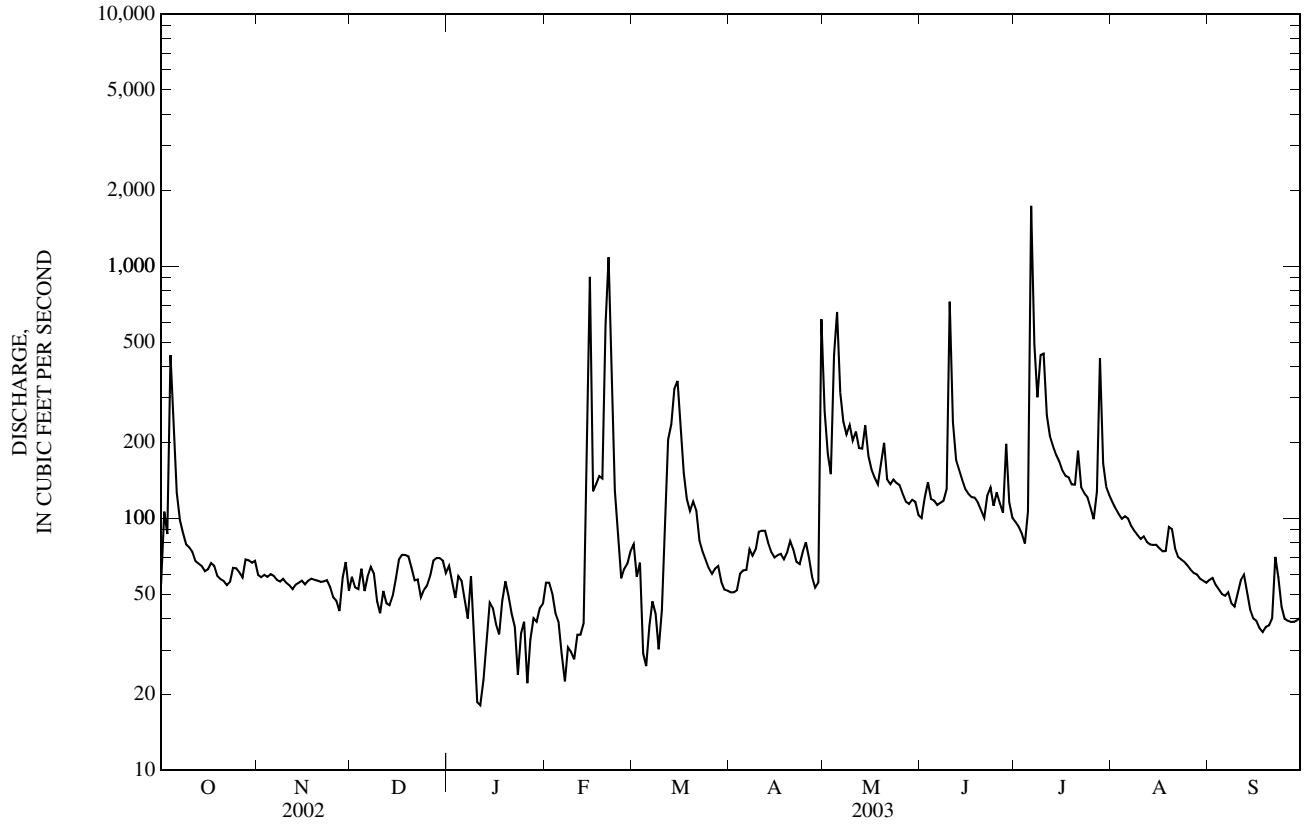
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	81.4	75.6	67.2	66.3	154	262	166	200	308	201	142	109
MAX	330	274	281	431	653	897	623	555	1,233	1,607	632	482
(WY)	(1994)	(1994)	(1985)	(1952)	(1971)	(1993)	(1983)	(1984)	(1991)	(1993)	(1993)	(1978)
MIN	9.61	12.8	6.05	3.29	9.43	27.8	12.5	13.6	22.1	22.8	14.4	6.70
(WY)	(1957)	(1959)	(1959)	(1959)	(1956)	(1957)	(1957)	(1957)	(1956)	(1970)	(1971)	(1956)

06608500 SOLDIER RIVER AT PISGAH, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	35,365		39,749			
ANNUAL MEAN	96.9		109		153	
HIGHEST ANNUAL MEAN					487	1993
LOWEST ANNUAL MEAN					27.3	1956
HIGHEST DAILY MEAN	1,660	Jun 11	1,730	Jul 6	20,700	Jul 17, 1996
LOWEST DAILY MEAN	34	Mar 3	18	Jan 11a	2.0	Jan 2, 1945b
ANNUAL SEVEN-DAY MINIMUM	38	Sep 7	30	Feb 6	2.0	Jan 2, 1945
MAXIMUM PEAK FLOW			3,990	Jul 6	34,700	Jul 17, 1996
MAXIMUM PEAK STAGE			11.28	Jul 6	28.87	Jul 17, 1996
ANNUAL RUNOFF (AC-FT)	70,150		78,840		110,600	
ANNUAL RUNOFF (CFSM)	0.24		0.27		0.38	
ANNUAL RUNOFF (INCHES)	3.23		3.63		5.10	
10 PERCENT EXCEEDS	140		191		282	
50 PERCENT EXCEEDS	72		68		73	
90 PERCENT EXCEEDS	48		40		17	

a Ice affected.
b Also Jan. 3-10, 1945.
e Estimated.



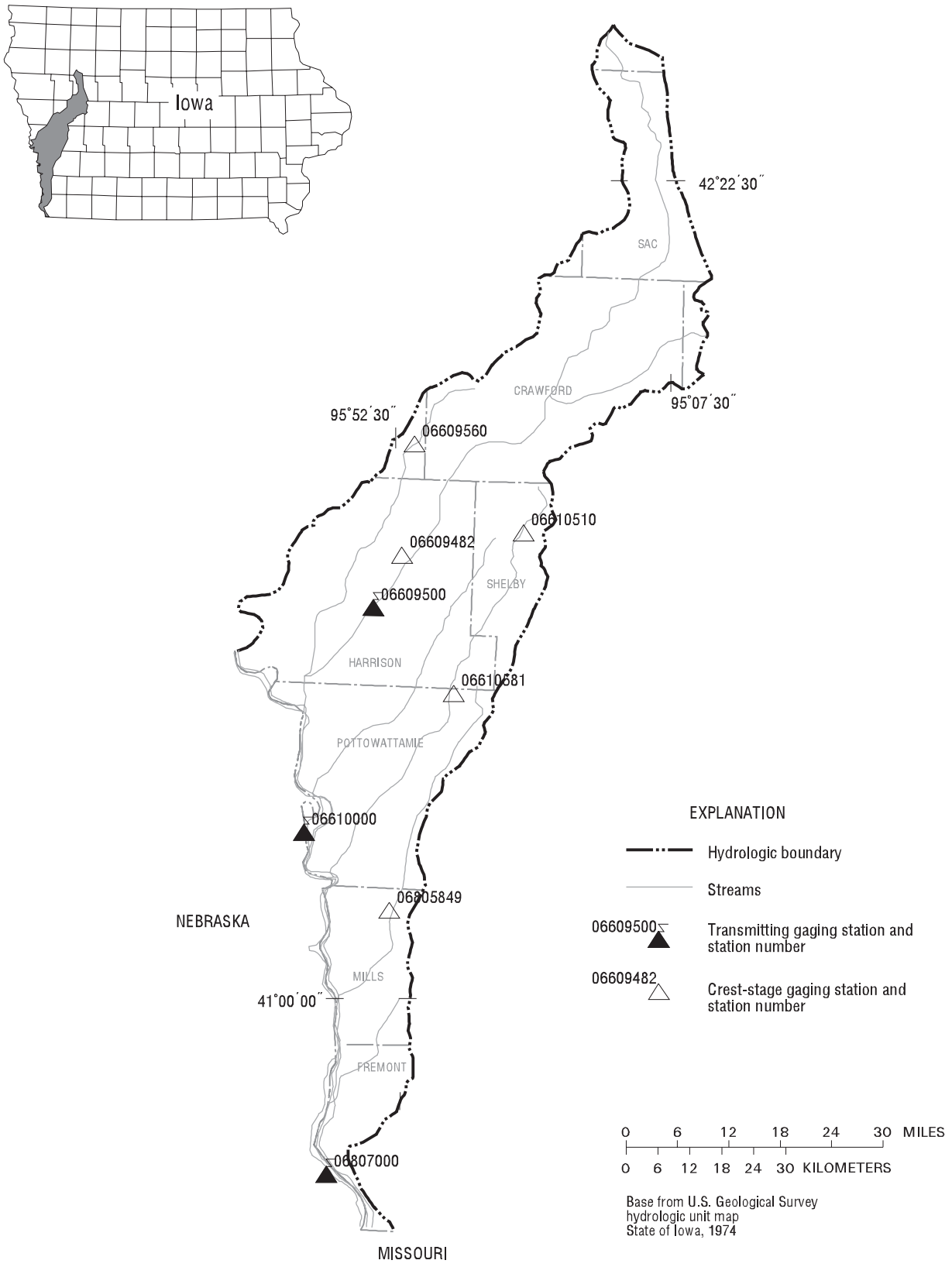


Figure 18. Locations of active continuous-record and crest-stage gaging stations in the Boyer River and Missouri River Main Stem drainage basins.

Gaging Stations

06609500 Boyer River at Logan, IA 402
06610000 Missouri River at Omaha, NE 404
06807000 Missouri River at Nebraska City, NE. 416

Crest Stage Gaging Stations

06609482 Boyer River Tributary at Woodbine, IA. 464
06609560 Willow Creek near Soldier, IA. 464
06610510 Moser Creek near Earling, IA 465
06610581 Mosquito Creek Tributary near Neola, IA 465
06805849 Keg Creek Tributary near Mineola, IA 465

06609500 BOYER RIVER AT LOGAN, IA

LOCATION.--Lat 41°38'30", long 95°46'57", in SE¼ NW¼ sec.19, T.79 N., R.42 W., Harrison County, Hydrologic Unit 10230007, on left bank downstream side of county bridge on Eight Street in Logan, 0.5 mi downstream from Elk Grove Creek, 10.4 mi upstream from Willow Creek, and 15.7 mi upstream from mouth.

DRAINAGE AREA.--871 mi^2.

PERIOD OF RECORD.--May 1918 to November 1924, February 1925 to July 1925, November 1937 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 956: 1938-39. WSP 1240: 1918-19, 1920 (M), 1921, 1922 (M), 1924-25, 1938 (M), 1945. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,009.38 ft above NGVD of 1929 (Chicago and Northwestern Railway Company bench mark). See WSP 1918 for history of changes prior to Oct. 18, 1960.

REMARKS.--Records are good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	160	e120	e145	e98	e449	191	701	384	364	329	98
2	218	157	e93	e139	e101	e422	184	588	403	345	314	97
3	245	161	e72	e127	e91	e436	179	509	464	333	299	94
4	407	161	e78	e144	e81	e409	185	2,720	440	319	286	89
5	471	164	e71	e139	e79	e409	201	2,800	416	332	283	84
6	330	165	e81	e120	e67	e409	197	1,740	407	1,070	281	83
7	285	163	e88	e86	e59	e409	214	1,320	524	1,440	268	81
8	239	160	e86	e102	e69	e409	204	1,090	483	1,080	255	80
9	212	157	e75	e80	e66	e409	210	1,130	448	2,380	242	81
10	199	158	e68	e63	e59	e402	217	1,000	827	3,230	234	83
11	189	156	e85	e61	e80	e503	234	954	617	4,170	234	89
12	179	154	e82	e67	e76	e590	273	898	477	1,930	232	94
13	166	152	e81	e74	e76	e630	278	859	450	1,050	214	107
14	161	152	e99	e83	e106	e737	249	997	422	871	201	91
15	158	152	e123	e81	e562	e757	228	863	396	769	195	82
16	153	155	e142	e78	e128	587	227	800	386	686	188	78
17	156	151	e180	e74	e131	485	220	736	387	629	179	74
18	152	154	189	e89	e136	380	205	677	395	589	171	77
19	144	151	178	e99	e126	322	203	687	384	553	165	77
20	137	152	166	e90	e137	305	217	687	350	530	161	81
21	139	151	140	e82	e1,850	284	213	605	334	544	154	93
22	134	147	e137	e78	e683	255	192	579	455	494	143	131
23	137	150	e129	e65	e489	238	180	571	408	497	134	119
24	143	147	e132	e75	e436	233	188	546	341	455	128	97
25	149	132	e136	e78	e436	222	205	529	345	442	122	81
26	149	e127	e140	e65	e436	211	201	505	444	408	115	78
27	144	e121	e144	e75	e422	208	189	475	482	399	112	75
28	154	e137	e146	e83	e436	215	186	463	554	551	106	74
29	162	e147	e148	e82	---	206	183	451	464	413	102	76
30	167	e112	e146	e87	---	205	1,370	446	396	369	98	78
31	166	---	e136	e90	---	196	---	409	---	346	97	---
TOTAL	5,945	4,506	3,691	2,801	7,516	11,932	7,423	27,335	13,283	27,588	6,042	2,622
MEAN	192	150	119	90.4	268	385	247	882	443	890	195	87.4
MAX	471	165	189	145	1,850	757	1,370	2,800	827	4,170	329	131
MIN	100	112	68	61	59	196	179	409	334	319	97	74
AC-FT	11,790	8,940	7,320	5,560	14,910	23,670	14,720	54,220	26,350	54,720	11,980	5,200
CFSM	0.22	0.17	0.14	0.10	0.31	0.44	0.28	1.01	0.51	1.02	0.22	0.10
IN.	0.25	0.19	0.16	0.12	0.32	0.51	0.32	1.17	0.57	1.18	0.26	0.11

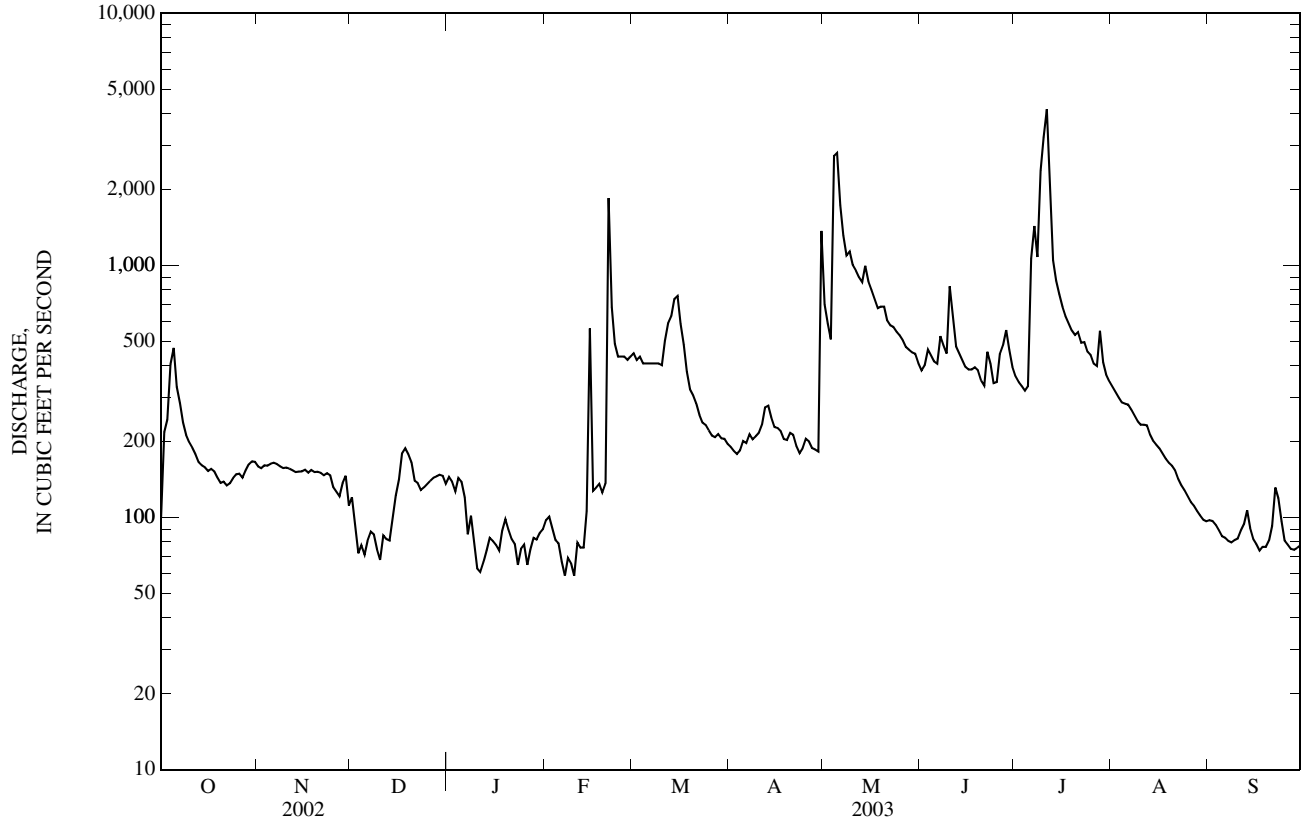
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 2003, BY WATER YEAR (WY)

MEAN	184	168	137	128	312	590	442	519	754	469	305	251
MAX	796	558	565	692	1,209	2,619	1,988	1,698	2,541	3,022	1,636	1,288
(WY)	(1974)	(1974)	(1973)	(1973)	(1971)	(1979)	(1983)	(1984)	(1990)	(1993)	(1951)	(1978)
MIN	11.1	8.33	6.68	3.06	3.55	40.4	23.3	39.9	33.3	51.0	34.5	11.6
(WY)	(1957)	(1940)	(1938)	(1940)	(1940)	(1981)	(1957)	(1968)	(1956)	(1977)	(1976)	(1939)

06609500 BOYER RIVER AT LOGAN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1919 - 2003	
ANNUAL TOTAL	78,719		120,684			
ANNUAL MEAN	216		331		358	
HIGHEST ANNUAL MEAN					1,018	1993
LOWEST ANNUAL MEAN					58.7	1956
HIGHEST DAILY MEAN	2,060	Jun 12	4,170	Jul 11	24,600	Jul 9, 1993
LOWEST DAILY MEAN	68	Dec 10	59	Feb 7a	1.5	Jul 16, 1938
ANNUAL SEVEN-DAY MINIMUM	78	Dec 4	68	Feb 6	2.0	Jan 13, 1940
MAXIMUM PEAK FLOW			5,330	Jul 9	30,800	Jun 17, 1990
MAXIMUM PEAK STAGE			14.71	Feb 21c	25.22	Mar 1, 1965b
ANNUAL RUNOFF (AC-FT)	156,100		239,400		259,600	
ANNUAL RUNOFF (CFSM)	0.25		0.38		0.41	
ANNUAL RUNOFF (INCHES)	3.36		5.15		5.59	
10 PERCENT EXCEEDS	369		629		755	
50 PERCENT EXCEEDS	156		188		166	
90 PERCENT EXCEEDS	99		80		35	

a Also Feb. 10; Ice affected.
b Ice affected.
c Backwater from ice jam.
e Estimated.



06610000 MISSOURI RIVER AT OMAHA, NE
(National stream-quality accounting network station)

LOCATION.--Lat 41°15'32", long 95°55'20", in SE¼ NW¼ sec.23, T.15 N., R.13 E., Douglas County, Hydrologic Unit 10230006, on right bank on left side of concrete floodwall, at foot of Douglas Street, 275 ft downstream from Interstate 480 Highway bridge in Omaha, and at mile 615.9.

DRAINAGE AREA.--322,800 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1928 to current year. April 1872 to December 1899 (gage heights only) in reports of the Missouri River Commission and since January 1875, (gage heights only) in reports of the U.S. Weather Bureau.

REVISED RECORDS.--WSP 761: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 948.24 ft above NGVD of 1929. See WSP 1730 for history of changes prior to Sept. 30, 1936. Oct. 1, 1936 to Sept. 30, 1982 at datum 10.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 396,000 ft^3/s Apr. 18, 1952, gage height, 40.20 ft, present datum; minimum, about 2,200 ft^3/s Jan. 6, 1937; minimum gage height, 6.85 ft, present datum, Feb. 5, 1989, result of freeze-up.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33,600	31,400	17,500	16,100	15,800	16,600	26,800	34,300	31,200	38,700	29,400	25,200
2	33,700	31,400	17,100	15,900	16,000	17,500	26,900	32,100	31,100	37,500	29,400	25,300
3	33,500	30,800	16,800	15,900	15,800	17,500	26,700	30,600	31,100	36,300	29,100	25,800
4	35,000	30,000	16,400	15,800	15,700	16,400	26,800	33,300	31,300	34,900	28,900	27,600
5	35,900	29,700	16,300	15,900	15,400	15,500	26,900	39,400	31,300	33,900	28,900	29,500
6	34,600	29,600	16,200	16,000	14,800	14,900	27,000	36,600	30,900	39,700	28,800	30,800
7	33,400	29,700	16,000	16,000	15,800	13,200	27,200	34,800	30,900	48,300	29,300	31,200
8	33,300	29,500	16,000	16,000	16,900	14,100	27,200	33,900	31,300	39,600	28,600	31,500
9	33,800	29,300	16,100	16,000	16,300	15,800	27,400	34,000	31,300	36,400	28,300	31,600
10	32,900	29,200	16,000	15,900	16,700	14,900	27,500	33,900	33,700	40,700	28,300	32,000
11	33,200	29,200	16,000	15,600	15,900	12,700	27,900	33,800	40,800	54,500	28,400	34,400
12	33,400	29,100	16,000	15,000	15,200	13,600	28,200	33,900	38,600	53,100	28,300	37,400
13	32,900	29,000	16,000	14,900	15,000	16,400	28,500	34,200	34,100	43,000	27,700	37,000
14	33,200	29,000	15,900	15,600	15,100	18,000	28,700	34,700	32,400	39,900	26,400	33,800
15	33,100	29,100	15,800	15,800	16,300	19,100	28,700	35,000	31,700	37,600	24,400	31,400
16	33,000	29,300	15,800	15,400	17,600	19,400	28,800	35,500	31,200	35,400	23,100	30,500
17	33,200	29,400	15,800	15,100	16,100	17,400	28,800	35,300	30,800	33,900	23,100	30,200
18	33,300	29,300	15,800	15,200	15,300	18,500	29,000	35,000	30,900	32,700	24,400	30,000
19	33,200	29,400	15,700	15,400	15,100	21,100	29,000	34,900	30,700	32,100	26,000	30,100
20	32,900	29,500	15,900	16,600	15,200	24,600	28,900	35,000	30,100	31,500	26,600	30,200
21	32,900	29,200	15,800	17,400	17,100	25,900	29,200	34,500	29,700	31,300	26,300	30,400
22	33,000	29,000	15,400	18,000	22,300	25,600	29,600	33,600	30,100	31,100	26,000	29,900
23	32,900	28,800	15,300	17,200	20,900	24,900	29,600	33,100	31,200	30,700	25,800	29,900
24	33,100	28,700	15,400	17,000	17,500	24,800	29,000	33,200	30,500	30,600	25,600	29,600
25	33,400	28,400	15,200	16,700	15,400	25,100	28,600	33,200	34,600	30,100	25,700	29,200
26	33,100	27,500	14,900	16,700	13,300	25,100	28,700	32,900	41,100	29,800	25,800	28,800
27	32,700	25,300	15,000	17,100	12,900	25,100	27,800	32,800	45,200	29,900	25,700	28,700
28	32,900	23,100	16,000	17,000	14,200	25,800	26,900	32,300	45,200	30,200	25,600	28,700
29	33,500	20,700	16,300	17,100	---	27,100	27,000	32,200	41,100	29,900	25,400	28,600
30	33,600	18,700	16,400	17,800	---	27,400	30,200	31,900	39,600	29,400	25,400	28,700
31	32,100	---	16,300	16,700	---	26,800	---	31,300	---	29,100	25,400	---
TOTAL	1,034,300	852,300	495,100	502,800	449,600	620,800	843,500	1,051,200	1,013,700	1,111,800	830,100	908,000
MEAN	33,360	28,410	15,970	16,220	16,060	20,030	28,120	33,910	33,790	35,860	26,780	30,270
MAX	35,900	31,400	17,500	18,000	22,300	27,400	30,200	39,400	45,200	54,500	29,400	37,400
MIN	32,100	18,700	14,900	14,900	12,900	12,700	26,700	30,600	29,700	29,100	23,100	25,200
AC-FT	2,052,000	1,691,000	982,000	997,300	891,800	1,231,000	1,673,000	2,085,000	2,011,000	2,205,000	1,647,000	1,801,000
CFSM	0.10	0.09	0.05	0.05	0.05	0.06	0.09	0.11	0.10	0.11	0.08	0.09
IN.	0.12	0.10	0.06	0.06	0.05	0.07	0.10	0.12	0.12	0.13	0.10	0.10

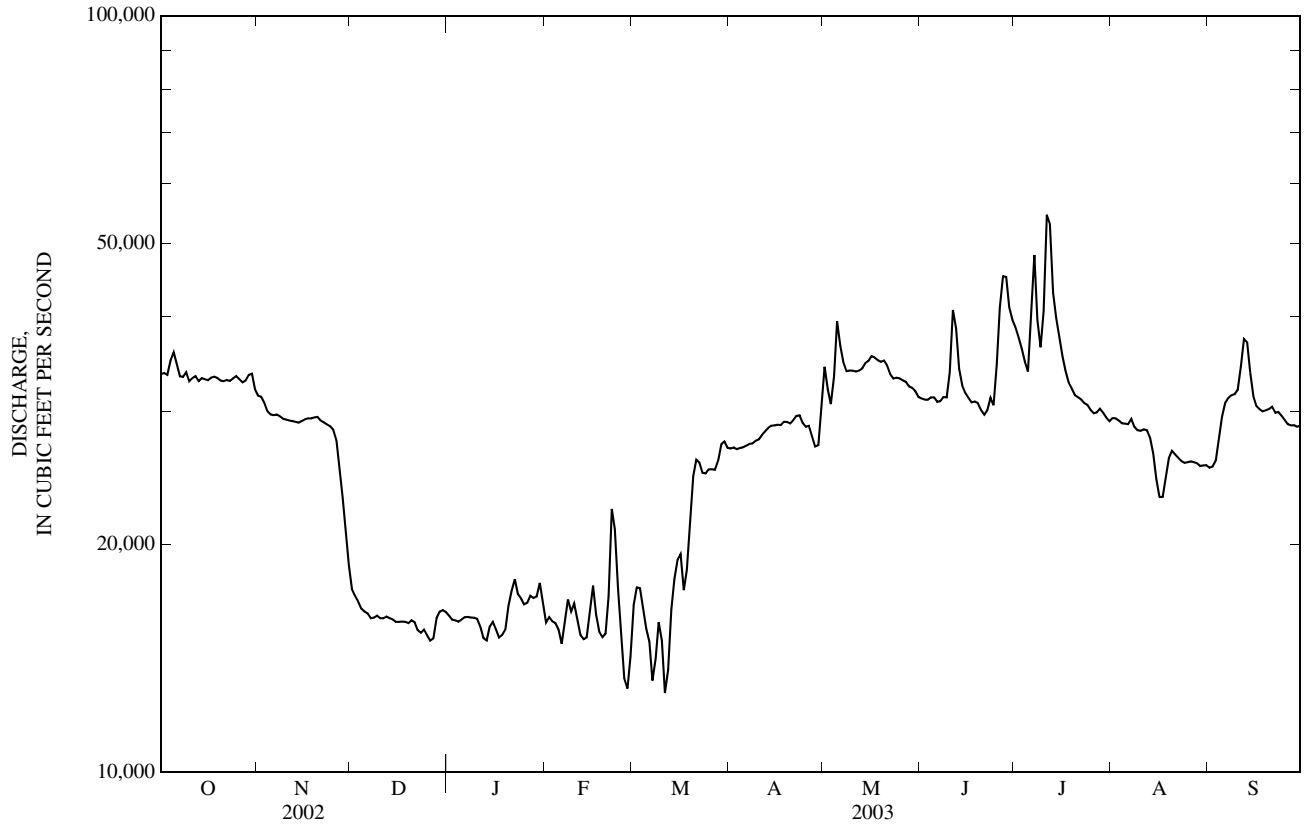
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2003, BY WATER YEAR (WY)

MEAN	38,410	34,100	21,000	17,740	19,770	27,860	38,650	38,550	41,700	40,320	38,750	38,790
MAX	74,070	75,040	44,260	33,250	40,410	54,660	93,840	87,620	76,120	78,560	68,890	69,770
(WY)	(1998)	(1998)	(1998)	(1987)	(1997)	(1997)	(1997)	(1997)	(1997)	(1993)	(1997)	(1997)
MIN	16,920	8,324	8,296	8,425	8,162	10,170	16,480	26,450	26,890	27,150	26,780	28,290
(WY)	(1962)	(1962)	(1962)	(1964)	(1963)	(1957)	(1957)	(1961)	(1961)	(1958)	(2003)	(1958)

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1953 - 2003a	
ANNUAL TOTAL	9,482,000		9,713,200			
ANNUAL MEAN	25,980		26,610		33,010	
HIGHEST ANNUAL MEAN					62,150	1997
LOWEST ANNUAL MEAN					20,490	1957
HIGHEST DAILY MEAN	40,000	Jun 12	54,500	Jul 11	116,000	Apr 4, 1960
LOWEST DAILY MEAN	14,900	Dec 26	12,700	Mar 11	2,440	Dec 14, 1961
ANNUAL SEVEN-DAY MINIMUM	15,300	Dec 21	14,200	Mar 6	4,300	Nov 28, 1955
MAXIMUM PEAK FLOW			58,400	Jul 11	120,000	Apr 1, 1960
MAXIMUM PEAK STAGE			22.07	Jul 11	30.26	Jul 10, 1993
INSTANTANEOUS LOW FLOW			12,300	Mar 11		
ANNUAL RUNOFF (AC-FT)	18,810,000		19,270,000		23,910,000	
ANNUAL RUNOFF (CFSM)	0.080		0.082		0.10	
ANNUAL RUNOFF (INCHES)	1.09		1.12		1.39	
10 PERCENT EXCEEDS	33,000		34,600		52,400	
50 PERCENT EXCEEDS	28,500		28,800		32,400	
90 PERCENT EXCEEDS	16,300		15,800		14,100	

a Post regulation.



06610000 MISSOURI RIVER AT OMAHA, NE—Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Water quality samples were collected by boat, 8.5 mi downstream from gaging station.

PERIOD OF RECORD.--July 1969 to 1976, 1978 to current year. Daily sediment loads for April 1939 to September 1971 are in reports of U.S. Army Corps of Engineers.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1972 to September 1976, January 1978 to September 1981, October 1991 to current year.
WATER TEMPERATURES: October 1971 to September 1976, January 1978 to September 1981, October 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976, October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens Dec. 4, 5, 1980; minimum daily, 335 microsiemens Mar. 22, 1978.
WATER TEMPERATURES: Maximum daily, 32.0°C July 24, 1972; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,180 mg/L May 19, 1974; minimum daily mean, 69 mg/L May 29, 2002.
SEDIMENT LOADS: Maximum daily, 1,470,000 tons Aug. 6, 1996; minimum daily, 2,560 tons Jan. 3, 1993.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 821 microsiemens Feb. 27; minimum daily, 663 microsiemens June 26.
WATER TEMPERATURES: Maximum daily, 29.1°C Aug. 6; minimum daily, 0.0°C Feb. 27.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,410 mg/L June 27; minimum daily mean, 92 mg/L Feb. 6.
SEDIMENT LOADS: Maximum daily, 343,000 tons July 12; minimum daily, 3,670 tons Feb. 6.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, wat unf lab, Hach 2100AN NTU (99872)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conductance, wat unf lab, uS/cm 25 degC (90095)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT													
16...	1100	32,900	21	735	9.7	94	8.5	8.3	708	770	6.5	12.5	240
DEC													
02...	1100	17,100	24	737	11.8	94	8.4	E7.7	814	828	6.0	4.0	280
JAN													
08...	1200	16,300	17	730	13.3	103	8.4	8.1	770	807	9.0	3.0	280
29...	1030	--	--	732	9.0	83	--	--	--	1,040	--	10.0	--
FEB													
20...	1300	15,200	14	737	12.8	97	8.3	7.9	758	789	9.5	2.0	260
MAR													
20...	1130	24,800	48	729	10.5	91	8.2	8.0	692	733	5.0	7.5	250
APR													
09...	1400	27,300	19	742	12.7	103	8.5	8.3	734	756	11.0	5.5	250
22...	1200	28,500	18	738	11.1	107	8.6	8.3	732	764	18.0	12.5	250
MAY													
01...	1130	34,500	560	733	8.5	86	8.3	E7.8	663	693	18.5	14.0	230
21...	1000	34,300	88	743	8.3	89	8.4	E8.0	747	773	18.5	17.5	290
JUN													
06...	1030	31,100	30	731	8.9	99	8.4	8.4	730	770	18.0	18.5	270
17...	1030	30,800	50	736	7.9	97	8.4	8.3	740	771	27.5	24.0	260
26...	1030	40,400	530	737	5.8	71	8.1	7.9	632	658	20.5	23.5	220
JUL													
11...	1030	55,500	400	735	6.0	75	8.1	8.0	637	670	26.5	24.5	240
AUG													
05...	1030	29,300	36	735	6.9	90	8.3	8.4	763	784	28.5	27.0	250
SEP													
09...	1030	31,500	27	736	7.2	86	8.0	8.3	725	769	20.0	24.0	220

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)
OCT													
16...	57.8	23.8	4.80	2	69.2	E188	172	206	2	12.1	0.5	7.71	199
DEC													
02...	68.9	27.2	4.90	2	68.0	212	200	240	2	15.9	0.5	8.36	200
JAN													
08...	71.2	25.7	5.21	2	67.0	206	210	252	2	15.0	0.53	10.8	189
29...	--	--	--	--	--	--	57	69	--	--	--	--	--
FEB													
20...	66.3	23.6	6.64	2	61.4	E232	--	212	1	18.8	0.48	11.4	180
MAR													
20...	62.6	22.7	5.83	2	55.0	181	163	199	--	13.8	0.49	10.9	173
APR													
09...	62.4	23.5	4.99	2	65.6	185	167	204	--	12.6	0.49	7.76	188
22...	61.4	24.2	5.75	2	62.9	185	159	191	--	13.0	0.54	7.28	188
MAY													
01...	56.4	21.9	6.32	1	52.0	173	164	201	--	13.3	0.49	6.68	162
21...	70.7	26.8	5.34	1	56.5	196	191	233	--	14.7	0.5	9.34	176
JUN													
06...	65.3	25.8	5.48	2	63.5	187	180	214	3	15.4	0.5	7.51	185
17...	63.1	24.7	5.58	2	60.8	186	182	222	--	15.1	0.5	7.24	186
26...	53.4	20.5	5.65	2	51.2	158	158	193	--	12.3	0.5	8.49	147
JUL													
11...	59.6	21.0	5.53	1	45.8	168	165	201	--	12.9	0.5	10.5	145
AUG													
05...	61.2	24.6	5.51	2	70.2	179	183	224	--	14.8	0.6	8.06	204
SEP													
09...	51.9	22.7	5.38	2	67.6	168	162	198	--	13.3	0.6	7.01	203

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Phosphorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Arsenic water, fltrd, ug/L (01000)
OCT													
16...	0.68	500	0.22	0.48	<0.04	0.46	0.010	0.013	0.018	0.129	2.3	3.0	2.1
DEC													
02...	0.75	550	0.35	0.61	0.14	0.65	0.010	0.016	0.021	0.146	2.0	3.1	2.0
JAN													
08...	0.72	527	0.27	0.55	0.07	0.82	E.007	0.022	0.030	0.101	1.7	3.0	2.0
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB													
20...	0.70	517	0.52	0.87	0.22	0.76	0.014	0.068	0.087	0.183	1.3	4.1	2.4
MAR													
20...	0.64	474	0.45	0.83	0.14	0.84	0.017	0.058	0.068	0.28	2.5	4.2	2.2
APR													
09...	0.68	496	0.19	0.46	<0.04	0.55	0.010	0.011	0.014	0.152	1.6	3.3	2.2
22...	0.66	486	0.23	0.54	<0.04	0.65	0.016	0.012	0.019	0.152	2.2	3.0	2.2
MAY													
01...	0.60	445	0.59	3.5	0.18	1.16	0.037	0.078	0.089	--	20.8	3.8	2.6
21...	0.69	508	0.34	0.92	<0.04	2.25	0.018	0.047	0.056	0.35	5.6	3.3	2.6
JUN													
06...	0.66	483	0.21	0.68	<0.04	1.13	0.008	0.016	0.025	0.178	2.5	3.1	2.3
17...	0.69	509	0.24	0.80	<0.04	1.37	0.009	0.020	0.028	0.24	5.3	2.8	2.7
26...	0.56	410	0.42	2.9	0.06	1.44	0.050	0.056	0.065	1.17	8.7	3.6	2.5
JUL													
11...	0.58	427	0.41	3.0	E.03	2.62	0.027	0.091	0.104	1.16	18.7	3.8	2.8
AUG													
05...	0.71	523	0.26	0.80	<0.04	0.56	0.009	0.016	0.021	0.184	3.9	3.5	2.6
SEP													
09...	0.68	502	0.19	0.56	<0.04	0.09	E.005	0.009	0.015	0.128	2.2	2.8	2.1

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Lithium water, fltrd, ug/L (01130)	Selenium, water, fltrd, ug/L (01145)	Strontium, water, fltrd, ug/L (01080)	Vanadium, water, fltrd, ug/L (01085)	2,6-Diethylaniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Acetochlor, water, fltrd, ug/L (49260)	Alachlor, water, fltrd, ug/L (46342)	alpha-HCH, water, fltrd, ug/L (34253)	alpha-HCH-d6, surrog, wat flt 0.7u GF percent recovry (91065)	Atrazine, water, fltrd, ug/L (39632)
OCT													
16...	138	<10	51.6	1.9	526	2.6	<0.006	E.007	0.009	<0.004	<0.005	100	0.087
DEC													
02...	134	<10	50.0	2.6	587	1.9	<0.006	E.006	<0.006	<0.004	<0.005	95.2	0.016
JAN													
08...	113	<10	44.7	2.8	575	2.1	<0.006	E.005	<0.006	<0.004	<0.005	101	0.016
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB													
20...	131	<10	51.9	2.2	577	4.8	<0.006	E.009	<0.010	<0.004	<0.005	83.9	0.025
MAR													
20...	106	<10	40.1	1.9	517	2.3	<0.006	<0.006	0.012	<0.004	<0.005	81.8	0.024
APR													
09...	126	<10	46.2	2.3	536	3.7	<0.006	E.006	0.008	<0.004	<0.005	92.8	0.024
22...	121	<10	42.6	2.2	528	3.1	<0.006	E.008	0.016	<0.004	<0.005	103	0.034
MAY													
01...	109	<10	37.9	2.2	440	3.1	<0.006	E.046	5.31	0.068	<0.005	86.5	6.00
21...	118	<10	45.2	2.6	527	2.9	<0.006	E.020	0.459	0.006	<0.005	93.5	0.886
JUN													
06...	138	E6	45.7	2.3	506	3.5	<0.006	E.011	0.027	<0.004	<0.005	107	0.095
17...	126	<8	44.0	2.4	526	4.3	<0.006	E.021	0.084	0.006	<0.005	107	0.325
26...	113	<8	37.8	2.0	439	3.9	<0.006	E.083	0.196	0.011	<0.005	89.5	2.08
JUL													
11...	81	<8	32.5	2.2	436	4.1	<0.006	E.065	0.050	<0.004	<0.005	101	0.596
AUG													
05...	123	E6	45.8	2.2	546	3.7	<0.006	E.010	<0.006	<0.004	<0.005	93.5	0.057
SEP													
09...	143	<8	51.9	1.7	554	3.6	<0.006	E.006	0.007	0.005	<0.005	104	0.034

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Azinphos-methyl, water, fltrd 0.7u GF ug/L (82686)	Benfluralin, water, fltrd 0.7u GF ug/L (82673)	Butylate, water, fltrd, ug/L (04028)	Carbaryl, water, fltrd 0.7u GF ug/L (82680)	Carbofuran, water, fltrd 0.7u GF ug/L (82674)	Chlorpyrifos water, fltrd, ug/L (38933)	cis-Permethrin water fltrd 0.7u GF ug/L (82687)	Cyanazine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Diazinon, water, fltrd, ug/L (39572)	Diazinon-d10 surrog. wat flt 0.7u GF percent recovry (91063)	Dieldrin, water, fltrd, ug/L (39381)	Disulfoton, water, fltrd 0.7u GF ug/L (82677)
OCT													
16...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	114	<0.005	<0.02
DEC													
02...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	100	<0.005	<0.02
JAN													
08...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	123	<0.005	<0.02
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB													
20...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	106	<0.005	<0.02
MAR													
20...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	112	<0.005	<0.02
APR													
09...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	115	<0.005	<0.02
22...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	120	<0.005	<0.02
MAY													
01...	<0.050	<0.010	<0.002	<0.041	E.009	0.008	<0.006	<0.018	<0.003	<0.005	104	<0.005	<0.02
21...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	104	<0.005	<0.02
JUN													
06...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	124	<0.005	<0.02
17...	<0.050	<0.010	<0.002	E.005	<0.020	<0.005	<0.006	<0.018	<0.003	0.016	125	<0.005	<0.02
26...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	0.007	117	<0.005	<0.02
JUL													
11...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	105	<0.005	<0.02
AUG													
05...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	100	<0.005	<0.02
SEP													
09...	<0.050	<0.010	<0.002	<0.041	<0.020	<0.005	<0.006	<0.018	<0.003	<0.005	107	<0.005	<0.02

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethalfluralin, water, fltrd 0.7u GF ug/L (82663)	Ethoprop, water, fltrd 0.7u GF ug/L (82672)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Malathion, water, fltrd, ug/L (39532)	Methyl parathion, water, fltrd 0.7u GF ug/L (82667)	Metolachlor, water, fltrd, ug/L (39415)	Metribuzin, water, fltrd, ug/L (82630)	Molinate, water, fltrd 0.7u GF ug/L (82671)	Napropamide, water, fltrd 0.7u GF ug/L (82684)	p,p'-DDE, water, fltrd, ug/L (34653)
OCT													
16...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.028	<0.006	<0.002	<0.007	<0.003
DEC													
02...	0.004	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.003	<0.006	<0.002	<0.007	<0.003
JAN													
08...	0.004	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.006	<0.006	<0.002	<0.007	<0.003
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB													
20...	0.004	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.012	<0.006	<0.002	<0.007	<0.003
MAR													
20...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.033	<0.006	<0.002	<0.007	<0.003
APR													
09...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.011	<0.006	<0.002	<0.007	<0.003
22...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.025	<0.006	<0.002	<0.007	<0.003
MAY													
01...	0.024	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	3.21	0.045	<0.002	<0.007	<0.003
21...	0.003	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.284	<0.006	<0.002	<0.007	<0.003
JUN													
06...	E.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.026	<0.006	<0.002	<0.007	<0.003
17...	E.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.075	<0.006	<0.002	<0.007	<0.003
26...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.227	<0.006	<0.002	<0.007	<0.003
JUL													
11...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	0.158	<0.006	<0.002	<0.007	<0.003
AUG													
05...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.011	<0.006	<0.002	<0.007	<0.003
SEP													
09...	<0.002	<0.009	<0.005	<0.003	<0.004	<0.035	<0.027	<0.006	E.007	<0.006	<0.002	<0.007	<0.003

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Parathion, water, fltrd, ug/L (39542)	Pebulate, water, fltrd 0.7u GF ug/L (82669)	Pendimethalin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prometon, water, fltrd, ug/L (04037)	Pronamide, water, fltrd 0.7u GF ug/L (82676)	Propachlor, water, fltrd, ug/L (04024)	Propanil, water, fltrd 0.7u GF ug/L (82679)	Propargite, water, fltrd 0.7u GF ug/L (82685)	Simazine, water, fltrd, ug/L (04035)	Tebuthiuron water fltrd 0.7u GF ug/L (82670)	Terbacil, water, fltrd 0.7u GF ug/L (82665)	Terbufos, water, fltrd 0.7u GF ug/L (82675)
OCT													
16...	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
DEC													
02...	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
JAN													
08...	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
29...	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB													
20...	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	0.007	<0.02	<0.034	<0.02
MAR													
20...	<0.010	<0.070	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
APR													
09...	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
22...	<0.010	<0.004	<0.022	<0.011	M	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
MAY													
01...	<0.010	<0.004	E.014	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	0.017	<0.02	<0.034	<0.02
21...	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	0.009	<0.02	<0.034	<0.02
JUN													
06...	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
17...	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
26...	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	0.009	<0.02	<0.034	<0.02
JUL													
11...	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
AUG													
05...	<0.010	<0.004	<0.022	<0.011	<0.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02
SEP													
09...	<0.010	<0.004	<0.022	<0.011	E.01	<0.004	<0.010	<0.011	<0.02	<0.005	<0.02	<0.034	<0.02

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Thio-bencarb water fltrd 0.7u GF ug/L (82681)	Tri-allate, water, fltrd 0.7u GF ug/L (82678)	Tri-flur-alin, water, fltrd 0.7u GF ug/L (82661)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
OCT						
16...	<0.005	<0.002	<0.009	23	178	15,800
DEC						
02...	<0.005	<0.002	<0.009	53	180	8,310
JAN						
08...	<0.005	<0.002	<0.009	33	100	4,400
29...	--	--	--	--	--	--
FEB						
20...	<0.005	<0.002	<0.009	26	130	5,340
MAR						
20...	<0.005	<0.002	<0.009	55	287	19,200
APR						
09...	<0.005	<0.002	<0.009	23	186	13,700
22...	<0.005	<0.002	<0.009	1	134	10,300
MAY						
01...	<0.005	<0.002	E.002	84	1,650	154,000
21...	<0.005	<0.002	<0.009	68	327	30,300
JUN						
06...	<0.005	<0.002	<0.009	49	186	15,600
17...	<0.005	<0.002	<0.009	69	273	22,700
26...	<0.005	<0.002	<0.009	92	1,140	124,000
JUL						
11...	<0.005	<0.002	<0.009	85	1,230	184,000
AUG						
05...	<0.005	<0.002	<0.009	62	191	15,100
SEP						
09...	<0.005	<0.002	<0.009	46	188	16,000

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Bed sedi-ment, dry svd sve dia percent <.063mm (80164)	Bed sedi-ment, dry svd sve dia percent <.125mm (80165)	Bed sedi-ment, dry svd sve dia percent <.25mm (80166)	Bed sedi-ment, dry svd sve dia percent <.5 mm (80167)	Bed sedi-ment, dry svd sve dia percent <1 mm (80168)	Bed sedi-ment, dry svd sve dia percent <2 mm (80169)	Bed sedi-ment, dry svd sve dia percent <4 mm (80170)	Bed sedi-ment, dry svd sve dia percent <8 mm (80171)	Bed sedi-ment, dry svd sve dia percent <16 mm (80172)	Number of sam-pling points, count (00063)
OCT											
04...	1120	0.0	1	32	97	99	99	99	100	--	3
NOV											
08...	1055	--	0.0	32	99	100	--	--	--	--	3
DEC											
02...	1150	--	0.0	22	87	96	98	99	100	--	3
JAN											
06...	1130	--	0.0	16	83	98	99	100	--	--	3
FEB											
12...	1330	--	0.0	21	86	97	99	100	--	--	3
MAR											
18...	1325	--	0.0	26	90	99	100	--	--	--	3
APR											
01...	1040	--	0.0	22	90	99	100	--	--	--	3
MAY											
01...	1110	--	0.0	20	85	98	100	--	--	--	3
JUN											
02...	1320	--	0.0	24	95	99	100	--	--	--	3
JUL											
15...	1415	0.0	1	18	89	97	98	99	99	100	3
AUG											
06...	1245	0.0	0.0	22	93	99	100	100	--	--	3
SEP											
02...	1345	0.0	0.0	21	93	99	100	100	100	--	3

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	755	---	---	---	---	736	701	---	---	803	---
2	---	---	756	---	---	---	---	---	759	---	---	784
3	---	---	---	---	---	---	---	---	---	747	---	---
4	777	734	---	---	795	---	748	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	794	779
6	---	---	740	747	---	---	---	705	763	---	747	---
7	769	---	---	---	---	766	---	---	---	---	---	---
8	---	749	---	724	---	---	762	---	---	685	783	779
9	---	---	---	---	---	---	---	772	762	---	---	777
10	---	---	---	---	---	---	---	---	---	---	---	---
11	765	754	---	---	---	759	756	---	---	688	787	770
12	---	---	---	---	753	---	---	763	670	---	---	---
13	---	---	742	---	---	---	---	---	---	---	789	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	741	---	---	---	---	761	---	---	776	---	775
16	749	---	---	---	---	---	---	764	782	---	---	---
17	---	---	---	---	---	---	---	---	---	787	---	---
18	757	---	---	---	---	725	765	---	---	---	---	---
19	---	---	727	---	---	---	---	---	---	---	791	762
20	---	750	---	---	787	748	---	765	782	---	---	---
21	---	---	---	---	---	---	---	777	---	805	---	---
22	746	741	---	---	---	---	757	---	---	---	785	---
23	---	---	745	---	---	---	---	759	---	---	---	764
24	---	---	---	---	---	---	---	---	---	794	---	---
25	755	---	---	---	---	666	786	---	---	---	---	762
26	---	741	---	---	---	---	---	---	663	---	775	---
27	---	---	---	---	821	---	---	760	---	---	---	---
28	771	---	---	---	---	708	---	---	---	796	---	---
29	---	---	---	---	---	---	773	---	---	---	778	762
30	---	---	---	---	---	---	---	783	718	---	---	---
31	---	---	758	773	---	---	---	---	---	---	---	---

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	9.0	---	---	---	---	8.0	14.0	---	---	28.0	---
2	---	---	4.0	---	---	---	---	---	20.5	---	---	25.0
3	---	---	---	---	---	---	---	---	---	28.0	---	---
4	17.0	5.5	---	---	1.0	---	12.5	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	27.0	26.0
6	---	---	3.0	2.5	---	---	---	16.0	18.5	---	29.1	---
7	14.0	---	---	---	---	1.0	---	---	---	---	---	---
8	---	6.0	---	3.0	---	---	6.5	---	---	27.5	27.5	24.5
9	---	---	---	---	---	---	---	16.5	20.5	---	---	24.0
10	---	---	---	---	---	---	---	---	---	---	---	---
11	15.5	6.5	---	---	---	5.0	9.0	---	---	24.5	28.5	23.0
12	---	---	---	---	1.0	---	---	15.0	21.5	---	---	---
13	---	---	3.0	---	---	---	---	---	---	---	28.5	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	7.0	---	---	---	---	14.0	---	---	28.0	---	21.5
16	12.5	---	---	---	---	---	---	17.0	25.0	---	---	---
17	---	---	---	---	---	---	---	---	---	28.5	---	---
18	15.0	---	---	---	---	9.5	14.5	---	---	---	---	---
19	---	---	4.0	---	---	---	---	---	---	---	29.0	21.0
20	---	6.0	---	---	2.0	7.5	---	18.0	26.0	---	---	---
21	---	---	---	---	---	---	---	17.5	---	29.0	---	---
22	11.0	6.0	---	---	---	---	12.5	---	---	---	28.5	---
23	---	---	1.5	---	---	---	---	19.0	---	---	---	19.5
24	---	---	---	---	---	---	---	---	---	27.0	---	---
25	10.0	---	---	---	---	8.5	13.5	---	---	---	---	19.5
26	---	4.0	---	---	---	---	---	---	23.5	---	28.5	---
27	---	---	---	---	0.0	---	---	20.0	---	---	---	---
28	9.0	---	---	---	---	8.5	---	---	---	28.5	---	---
29	---	---	---	---	---	---	17.0	---	---	---	28.0	16.5
30	---	---	---	---	---	---	---	22.0	25.0	---	---	---
31	---	---	2.0	1.0	---	---	---	---	---	---	---	---

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

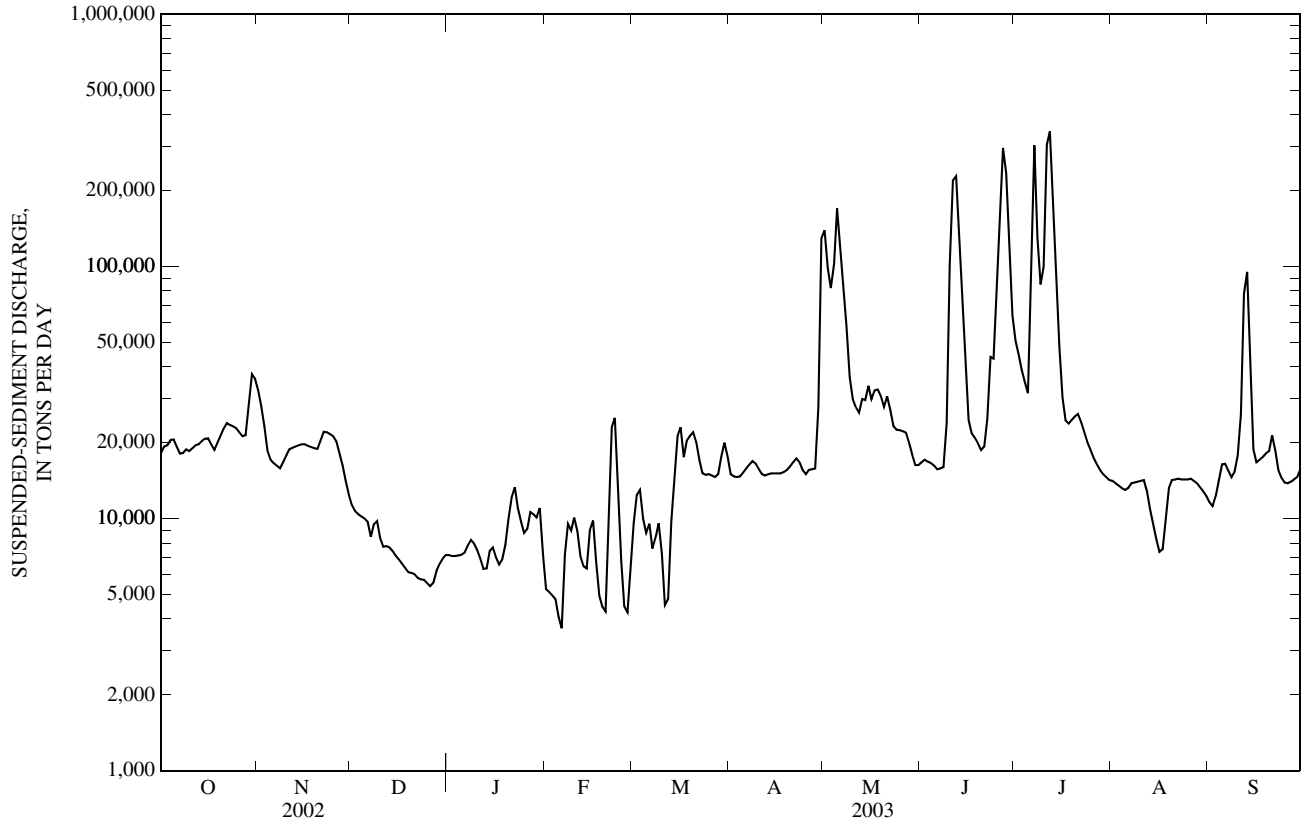
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	200	18,200	380	32,200	239	11,300	165	7,160	123	5,250	213	9,600
2	212	19,300	330	27,900	233	10,700	165	7,100	118	5,110	261	12,400
3	216	19,500	279	23,100	230	10,400	166	7,110	116	4,960	274	13,000
4	218	20,500	230	18,600	229	10,200	167	7,140	113	4,790	224	9,960
5	213	20,600	214	17,100	227	10,000	167	7,190	98	4,090	209	8,760
6	207	19,300	207	16,600	222	9,710	170	7,340	92	3,670	237	9,540
7	201	18,100	201	16,200	196	8,470	181	7,820	168	7,220	213	7,600
8	203	18,200	198	15,800	219	9,490	190	8,220	209	9,530	221	8,420
9	206	18,800	211	16,700	224	9,780	184	7,960	204	8,970	225	9,580
10	209	18,500	225	17,800	194	8,380	174	7,500	225	10,100	180	7,260
11	212	19,000	239	18,800	180	7,740	165	6,950	207	8,900	131	4,530
12	217	19,500	243	19,100	179	7,770	156	6,320	173	7,080	129	4,790
13	222	19,700	246	19,300	178	7,680	157	6,340	160	6,460	220	9,760
14	227	20,300	249	19,500	173	7,430	177	7,440	156	6,340	291	14,100
15	232	20,700	251	19,700	167	7,120	180	7,680	204	8,990	410	21,200
16	234	20,800	249	19,700	161	6,870	169	7,030	206	9,810	437	23,000
17	220	19,700	245	19,400	155	6,630	162	6,580	154	6,750	373	17,500
18	208	18,700	242	19,200	149	6,370	168	6,880	120	4,950	409	20,400
19	222	19,900	239	19,000	144	6,120	189	7,890	110	4,470	374	21,300
20	239	21,300	238	18,900	142	6,090	222	9,930	104	4,280	331	22,000
21	256	22,700	260	20,500	141	6,010	258	12,100	170	8,100	288	20,100
22	269	23,900	283	22,100	140	5,820	274	13,300	378	23,000	245	17,000
23	265	23,500	283	22,000	139	5,730	236	11,000	440	25,100	225	15,100
24	259	23,200	280	21,600	137	5,720	212	9,710	265	12,500	223	14,900
25	253	22,800	276	21,200	136	5,540	195	8,760	163	6,800	221	15,000
26	247	22,000	273	20,200	134	5,390	201	9,100	125	4,480	218	14,800
27	240	21,200	267	18,200	137	5,570	230	10,600	122	4,240	215	14,600
28	240	21,400	260	16,200	144	6,210	226	10,400	164	6,350	215	15,000
29	318	28,800	253	14,100	151	6,620	219	10,100	---	---	242	17,700
30	412	37,400	246	12,400	157	6,940	228	11,000	---	---	271	20,000
31	415	35,900	---	---	163	7,170	159	7,210	---	---	244	17,600
TOTAL	---	673,400	---	583,100	---	234,970	---	260,860	---	222,290	---	436,500

06610000 MISSOURI RIVER AT OMAHA, NE—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	207	15,000	1,500	139,000	199	16,700	486	50,900	177	14,100	170	11,600
2	203	14,700	1,130	98,200	204	17,100	441	44,700	175	13,800	164	11,200
3	203	14,600	991	82,100	201	16,800	397	38,900	172	13,500	176	12,300
4	204	14,700	1,090	102,000	196	16,600	368	34,700	169	13,200	192	14,300
5	210	15,200	1,590	170,000	192	16,200	344	31,400	167	13,000	206	16,400
6	217	15,800	1,160	115,000	189	15,700	646	73,000	169	13,200	198	16,500
7	224	16,400	878	82,700	189	15,800	2,300	302,000	175	13,800	184	15,500
8	231	16,900	630	57,700	189	16,000	1,210	131,000	180	13,900	172	14,600
9	223	16,500	396	36,300	282	23,900	862	84,900	183	14,000	179	15,300
10	211	15,700	325	29,800	1,090	101,000	901	99,700	185	14,100	206	17,800
11	199	15,000	302	27,600	1,980	219,000	2,020	304,000	186	14,200	278	26,000
12	195	14,800	287	26,300	2,180	228,000	2,380	343,000	167	12,800	769	77,800
13	195	15,000	324	29,800	1,240	114,000	1,730	202,000	145	10,900	949	95,100
14	195	15,100	314	29,500	707	61,900	1,080	116,000	134	9,540	430	39,400
15	195	15,100	356	33,600	459	39,300	475	48,400	126	8,300	222	18,800
16	195	15,100	310	29,700	291	24,600	316	30,200	118	7,370	203	16,700
17	194	15,100	337	32,200	262	21,800	268	24,500	121	7,560	210	17,100
18	195	15,300	344	32,500	251	20,900	270	23,800	154	10,100	217	17,500
19	199	15,600	325	30,600	239	19,900	284	24,600	187	13,200	223	18,100
20	206	16,100	293	27,700	230	18,700	298	25,400	198	14,200	227	18,500
21	212	16,700	327	30,500	241	19,300	307	26,000	201	14,300	260	21,400
22	216	17,300	297	26,900	306	24,900	288	24,100	205	14,400	231	18,600
23	209	16,700	260	23,300	519	43,800	265	22,000	206	14,300	193	15,600
24	200	15,600	251	22,500	522	43,100	244	20,100	206	14,300	181	14,500
25	194	15,000	251	22,400	777	73,800	230	18,700	207	14,300	176	13,900
26	201	15,600	250	22,200	1,380	154,000	216	17,400	207	14,400	177	13,800
27	210	15,700	247	21,900	2,410	295,000	203	16,400	203	14,100	181	14,000
28	218	15,800	229	20,000	1,910	234,000	191	15,600	199	13,800	184	14,300
29	378	27,600	206	17,900	1,210	135,000	186	15,000	195	13,300	189	14,600
30	1,570	129,000	189	16,300	598	64,000	183	14,600	187	12,800	201	15,600
31	---	---	193	16,300	---	---	180	14,200	178	12,300	---	---
TOTAL	---	592,700	---	1,452,500	---	2,110,800	---	2,237,200	---	397,070	---	646,800
YEAR	9,848,190											

06610000 MISSOURI RIVER AT OMAHA, NE—Continued



THIS PAGE IS INTENTIONALLY BLANK

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE

LOCATION.--Lat 40°40'55", long 95°50'48", in NW$^1/_4$ NE$^1/_4$ sec.9, T.8 N., R.14 E., Otoe County, Hydrologic Unit 10240001, on right bank 1.0 mi upstream from Highway 2 Bridge at Nebraska City, and at mile 562.6.

DRAINAGE AREA.--410,000 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1929 to current year. Gage-height records collected in this vicinity from August 1878 to December 1899 are contained in reports of Missouri River Commission.

REVISED RECORDS.--WSP 761: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 905.36 ft above NGVD of 1929, supplementary adjustment of 1954. See WSP 1918 or 1919 for history of changes prior to Apr. 1, 1963.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 414,000 ft^3/s Apr. 19, 1952; maximum gage height, 27.66 ft Apr. 18, 1952; minimum discharge, 1,600 ft^3/s Dec. 31, 1946 (discharge measurement); minimum gage height observed, -0.28 ft Dec. 24, 1960, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34,600	35,600	23,600	19,700	18,800	16,800	32,100	42,900	35,600	45,600	30,100	26,600
2	36,800	35,200	22,300	19,600	18,600	20,300	32,600	42,100	35,500	44,500	30,500	26,300
3	36,600	34,800	20,600	19,500	19,600	21,900	32,400	41,400	35,200	43,300	29,900	26,300
4	37,800	34,200	20,800	19,900	20,000	22,400	32,300	39,700	34,800	42,100	29,800	27,300
5	40,000	34,000	20,900	20,500	20,200	22,100	32,600	51,700	34,700	40,800	29,500	29,300
6	38,000	33,500	18,800	20,700	20,200	21,300	32,600	62,900	35,400	41,800	29,600	30,900
7	36,500	33,400	17,500	20,700	19,700	19,600	33,100	52,500	35,000	48,500	29,800	31,500
8	35,900	33,400	19,100	20,100	21,700	17,400	33,300	47,500	36,000	50,000	30,300	31,700
9	36,300	33,300	20,000	20,100	22,700	19,100	32,800	47,000	36,200	44,800	29,800	32,200
10	36,400	33,000	19,800	21,000	21,200	21,500	32,500	45,900	36,800	43,700	29,800	32,800
11	35,800	32,900	19,600	20,900	20,900	19,800	32,500	45,100	42,700	49,800	30,200	34,000
12	36,500	32,700	20,200	18,800	19,400	17,900	33,100	44,500	47,100	54,600	30,000	37,000
13	36,100	32,500	20,700	e16,200	18,200	21,800	33,000	43,800	43,800	48,900	29,500	39,300
14	35,800	32,300	20,500	e16,000	18,900	25,500	33,300	44,100	40,900	44,100	28,800	39,000
15	36,000	32,700	20,400	18,000	20,500	28,100	33,300	44,000	38,500	41,900	27,200	37,600
16	35,700	32,800	20,400	17,600	22,200	30,500	33,400	43,400	37,100	39,600	25,300	36,000
17	35,900	32,400	20,700	15,700	23,100	27,700	32,400	42,900	36,200	38,000	24,400	34,700
18	35,900	31,600	20,800	e15,500	21,400	23,900	33,600	41,900	35,900	36,100	24,400	33,900
19	36,100	32,100	20,600	e15,600	21,700	25,200	34,000	41,400	36,300	34,900	26,100	33,300
20	36,500	32,400	20,600	e16,400	22,200	28,900	34,000	41,200	36,200	34,200	27,400	33,000
21	36,100	32,500	21,200	17,300	23,400	31,500	34,400	42,500	34,500	33,200	28,000	33,000
22	36,200	32,700	21,300	18,700	29,100	31,500	34,400	40,500	34,400	32,800	27,700	32,800
23	36,100	32,900	19,500	19,300	35,700	30,700	34,700	39,300	36,400	32,400	27,200	31,500
24	36,100	32,700	18,200	18,300	28,500	29,800	34,800	39,100	38,500	31,900	26,900	31,500
25	36,300	33,400	18,100	18,400	22,500	30,000	33,800	39,000	38,000	31,800	26,500	31,200
26	36,300	32,800	18,100	18,000	18,700	30,000	33,300	38,400	44,300	30,900	26,700	30,800
27	36,200	31,000	17,300	18,300	16,300	29,700	33,200	38,200	48,900	30,600	26,700	30,400
28	36,300	29,100	17,100	19,300	15,800	30,100	33,000	37,500	49,900	31,000	26,800	30,500
29	36,500	26,400	18,500	19,700	---	31,300	33,200	37,500	48,400	30,800	26,800	30,200
30	37,200	24,500	19,300	19,700	---	32,200	34,500	37,100	46,600	30,200	26,700	30,000
31	36,700	---	19,700	20,200	---	31,900	---	36,400	---	30,100	26,800	---
TOTAL	1,129,200	972,800	616,200	579,700	601,200	790,400	998,200	1,331,400	1,169,800	1,212,900	869,200	964,600
MEAN	36,430	32,430	19,880	18,700	21,470	25,500	33,270	42,950	38,990	39,130	28,040	32,150
MAX	40,000	35,600	23,600	21,000	35,700	32,200	34,800	62,900	49,900	54,600	30,500	39,300
MIN	34,600	24,500	17,100	15,500	15,800	16,800	32,100	36,400	34,400	30,100	24,400	26,300
AC-FT	2,240,000	1,930,000	1,222,000	1,150,000	1,192,000	1,568,000	1,980,000	2,641,000	2,320,000	2,406,000	1,724,000	1,913,000
CFSM	0.09	0.08	0.05	0.05	0.05	0.06	0.08	0.10	0.10	0.10	0.07	0.08
IN.	0.10	0.09	0.06	0.05	0.05	0.07	0.09	0.12	0.11	0.11	0.08	0.09

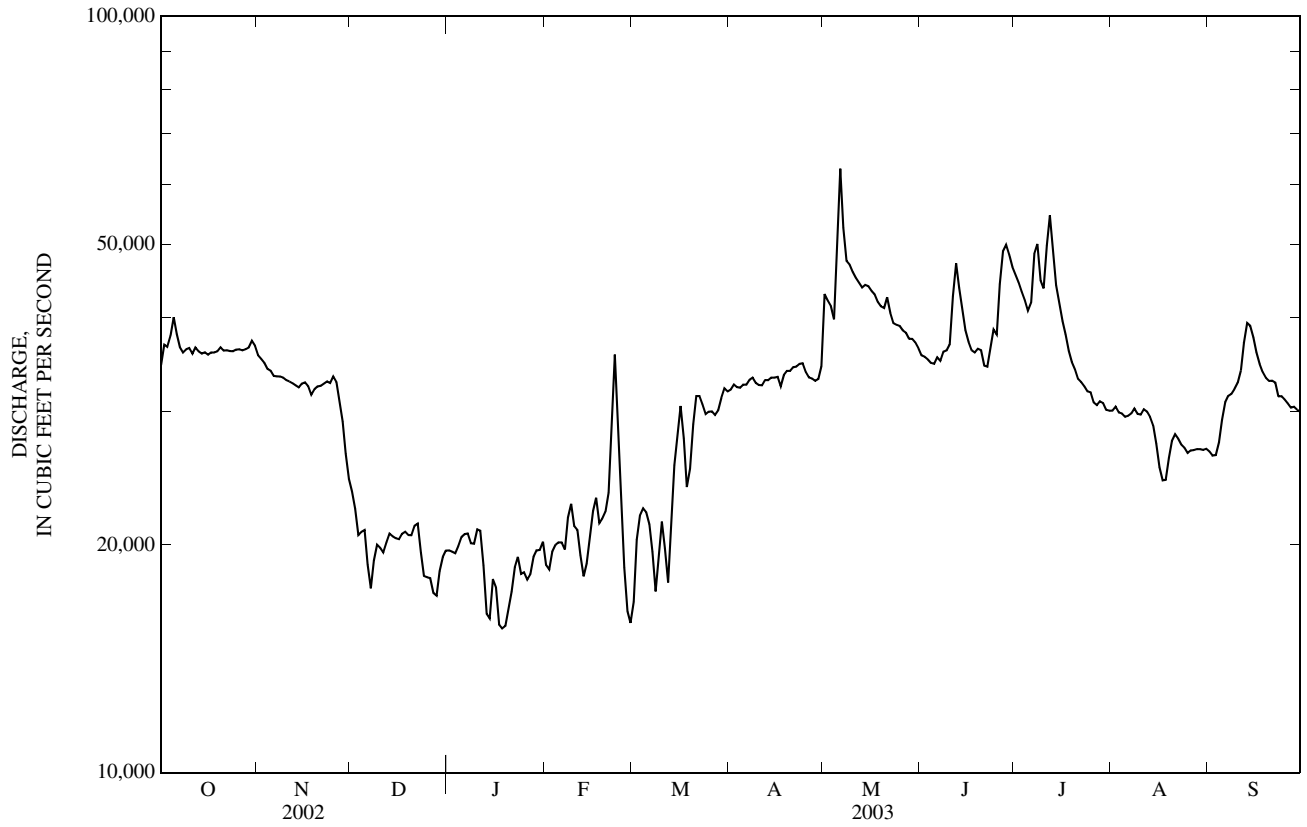
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2003, BY WATER YEAR (WY)

MEAN	42,700	38,900	25,510	21,480	26,470	37,660	47,540	47,610	51,910	46,100	42,360	42,320
MAX	76,760	79,410	52,410	39,970	48,630	66,730	98,960	90,280	117,500	116,700	71,540	73,410
(WY)	(1998)	(1998)	(1987)	(1987)	(1983)	(1983)	(1997)	(1997)	(1984)	(1993)	(1996)	(1997)
MIN	22,420	14,380	10,510	10,160	12,780	15,310	21,850	32,470	33,530	28,830	28,040	32,150
(WY)	(1962)	(1962)	(1956)	(1957)	(1957)	(1957)	(1957)	(1955)	(1958)	(2002)	(2003)	(2003)

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1953 - 2003a	
ANNUAL TOTAL	10,950,600		11,235,600			
ANNUAL MEAN	30,000		30,780		39,240	
HIGHEST ANNUAL MEAN					66,450	1997
LOWEST ANNUAL MEAN					25,370	1957
HIGHEST DAILY MEAN	51,200	Aug 23	62,900	May 6	188,000	Jul 25, 1993
LOWEST DAILY MEAN	17,100	Dec 28	15,500	Jan 18b	4,320	Jan 11, 1957
ANNUAL SEVEN-DAY MINIMUM	18,100	Dec 24	16,400	Jan 13	5,590	Nov 29, 1955
MAXIMUM PEAK FLOW			65,900	May 6	196,000	Jul 23, 1993
MAXIMUM PEAK STAGE			14.09	May 6	27.19	Jul 23, 1993
INSTANTANEOUS LOW FLOW			14,600	Jan 18		
ANNUAL RUNOFF (AC-FT)	21,720,000		22,290,000		28,430,000	
ANNUAL RUNOFF (CFSM)	0.073		0.075		0.096	
ANNUAL RUNOFF (INCHES)	0.99		1.02		1.30	
10 PERCENT EXCEEDS	36,200		42,000		61,400	
50 PERCENT EXCEEDS	32,400		32,200		37,000	
90 PERCENT EXCEEDS	20,600		19,300		18,000	

a Post regulation.
b Ice affected.
e Estimated.



06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.—Continued

WATER-QUALITY RECORDS

LOCATION.--Water quality samples were collected by boat, 0.5 miles upstream of gage.

PERIOD OF RECORD.--May 1951 to current year. Daily sediment loads August 1957 to September 1971 in reports of U.S. Army Corps of Engineers.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1951 to December 1977, October 1991 to current year.
WATER TEMPERATURES: May 1951 to December 1977, October 1991 to current year.
SUSPENDED SEDIMENT DISCHARGE: October 1971 to September 1976, October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 994 microsiemens Dec. 17, 1962; minimum daily, 273 microsiemens June 17, 1964.
WATER TEMPERATURES: Maximum daily, 31.0°C July 26, 1977, and July 25, 1997; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,420 mg/L Aug. 7, 1996; minimum daily mean, 80 mg/L Aug. 3, 2002.
SEDIMENT LOADS: Maximum daily, 3,120,000 tons June 24, 1996; minimum daily, 4,050 tons Jan. 17, 1972.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 832 microsiemens Jan. 31, Sept. 11; minimum daily, 599 microsiemens May 6.
WATER TEMPERATURES: Maximum daily, 29.5°C July 21, Aug. 19; minimum daily, 0.5°C Feb. 12.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,060 mg/L May 6; minimum daily, 135 mg/L Aug. 5.
SEDIMENT LOADS: Maximum daily, 691,000 tons May 6; minimum daily, 7,950 tons Jan. 18.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Bed sediment, dry svd sve dia percent <.063mm (80164)	Bed sediment, dry svd sve dia percent <.125mm (80165)	Bed sediment, dry svd sve dia percent <.25mm (80166)	Bed sediment, dry svd sve dia percent <.5 mm (80167)	Bed sediment, dry svd sve dia percent <1 mm (80168)	Bed sediment, dry svd sve dia percent <2 mm (80169)	Bed sediment, dry svd sve dia percent <4 mm (80170)	Bed sediment, dry svd sve dia percent <8 mm (80171)	Bed sediment, dry svd sve dia percent <16 mm (80172)	Number of sampling points, count (00063)
OCT											
04...	1225	--	0.0	15	47	67	85	96	99	100	3
NOV											
08...	1210	--	0.0	14	55	77	88	96	100	--	3
JAN											
06...	0950	--	0.0	14	42	62	86	97	100	--	3
FEB											
12...	1120	--	0.0	23	77	91	97	99	100	--	3
MAR											
11...	1415	--	0.0	18	57	72	84	94	98	100	3
APR											
01...	1345	--	0.0	13	60	82	90	96	100	--	3
MAY											
02...	1330	--	0.0	24	63	84	97	99	100	--	3
JUN											
02...	1115	--	0.0	10	44	75	90	97	100	--	3
JUL											
15...	1135	--	0.0	21	53	68	86	95	98	100	3
AUG											
06...	0945	0.0	0.0	9	32	67	85	96	100	--	3
SEP											
02...	1115	0.0	0.0	19	54	79	96	99	100	--	3

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, LABORATORY, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	781	---	---	---	---	725	---	---	---	801	---
2	---	---	---	---	---	---	---	673	764	---	---	799
3	---	---	---	---	---	---	---	---	---	755	---	---
4	770	---	---	---	823	---	757	---	---	---	---	---
5	---	756	770	---	---	---	---	---	760	---	---	794
6	---	---	---	775	---	---	---	599	---	---	804	---
7	746	---	---	---	---	753	---	---	---	---	---	---
8	---	766	---	---	---	---	---	---	---	629	787	795
9	---	---	---	---	---	---	766	678	752	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	762	767	---	---	---	751	754	---	---	736	803	832
12	---	---	---	---	818	---	---	722	647	---	---	---
13	---	---	781	---	---	---	---	---	---	---	805	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	754	---	---	---	---	762	---	---	757	---	719
16	771	---	---	---	---	---	---	725	---	---	---	---
17	---	---	781	---	---	---	---	---	---	786	---	---
18	785	---	---	---	---	666	771	---	---	---	---	---
19	---	774	---	---	---	---	---	754	755	---	813	757
20	---	---	---	---	784	---	---	---	776	---	---	---
21	---	---	---	---	---	734	---	---	---	799	---	---
22	773	770	---	---	---	---	758	---	---	---	784	---
23	---	---	783	---	---	---	---	745	---	---	---	766
24	---	---	---	---	---	---	---	---	---	800	---	---
25	785	---	---	---	---	692	764	---	---	---	---	769
26	---	---	---	---	---	---	---	---	---	---	796	---
27	---	772	---	---	---	---	---	762	682	---	---	---
28	---	---	---	---	820	707	---	---	---	810	---	---
29	771	772	---	---	---	---	755	---	---	---	813	770
30	---	---	---	---	---	---	---	762	684	---	---	---
31	---	---	791	832	---	---	---	---	---	---	---	---

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	9.0	---	---	---	---	9.5	---	---	---	28.0	---
2	---	---	---	---	---	---	---	16.5	22.0	---	---	25.0
3	---	---	---	---	---	---	---	---	---	28.0	---	---
4	16.0	---	---	---	1.0	---	13.0	---	---	---	---	---
5	---	5.5	3.0	---	---	---	---	---	20.5	---	---	26.0
6	---	---	---	2.5	---	---	---	16.0	---	---	27.7	---
7	14.0	---	---	---	---	1.0	---	---	---	---	---	---
8	---	6.0	---	---	---	---	---	---	---	27.5	29.0	25.0
9	---	---	---	---	---	---	6.5	16.5	21.0	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	15.5	7.5	---	---	---	2.0	9.5	---	---	26.5	29.0	24.0
12	---	---	---	---	0.5	---	---	15.0	22.5	---	---	---
13	---	---	3.0	---	---	---	---	---	---	---	28.5	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	7.0	---	---	---	---	15.5	---	---	28.0	---	21.5
16	12.0	---	---	---	---	---	---	17.5	---	---	---	---
17	---	---	4.5	---	---	---	---	---	---	28.5	---	---
18	15.0	---	---	---	---	8.0	15.0	---	---	---	---	---
19	---	6.5	---	---	---	---	---	19.0	25.5	---	29.5	21.0
20	---	---	---	---	2.5	---	---	---	26.0	---	---	---
21	---	---	---	---	---	8.0	---	---	---	29.5	---	---
22	11.0	6.0	---	---	---	---	12.0	---	---	---	28.5	---
23	---	---	1.5	---	---	---	---	19.0	---	---	---	19.0
24	---	---	---	---	---	---	---	---	---	27.5	---	---
25	10.0	---	---	---	---	10.0	13.0	---	---	---	---	20.0
26	---	---	---	---	---	---	---	---	---	---	28.5	---
27	---	3.5	---	---	---	---	---	21.0	25.0	---	---	---
28	---	---	---	---	1.0	8.5	---	---	---	28.0	---	---
29	9.0	3.0	---	---	---	---	17.5	---	---	---	29.0	16.5
30	---	---	---	---	---	---	---	22.0	26.0	---	---	---
31	---	---	2.0	1.5	---	---	---	---	---	---	---	---

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

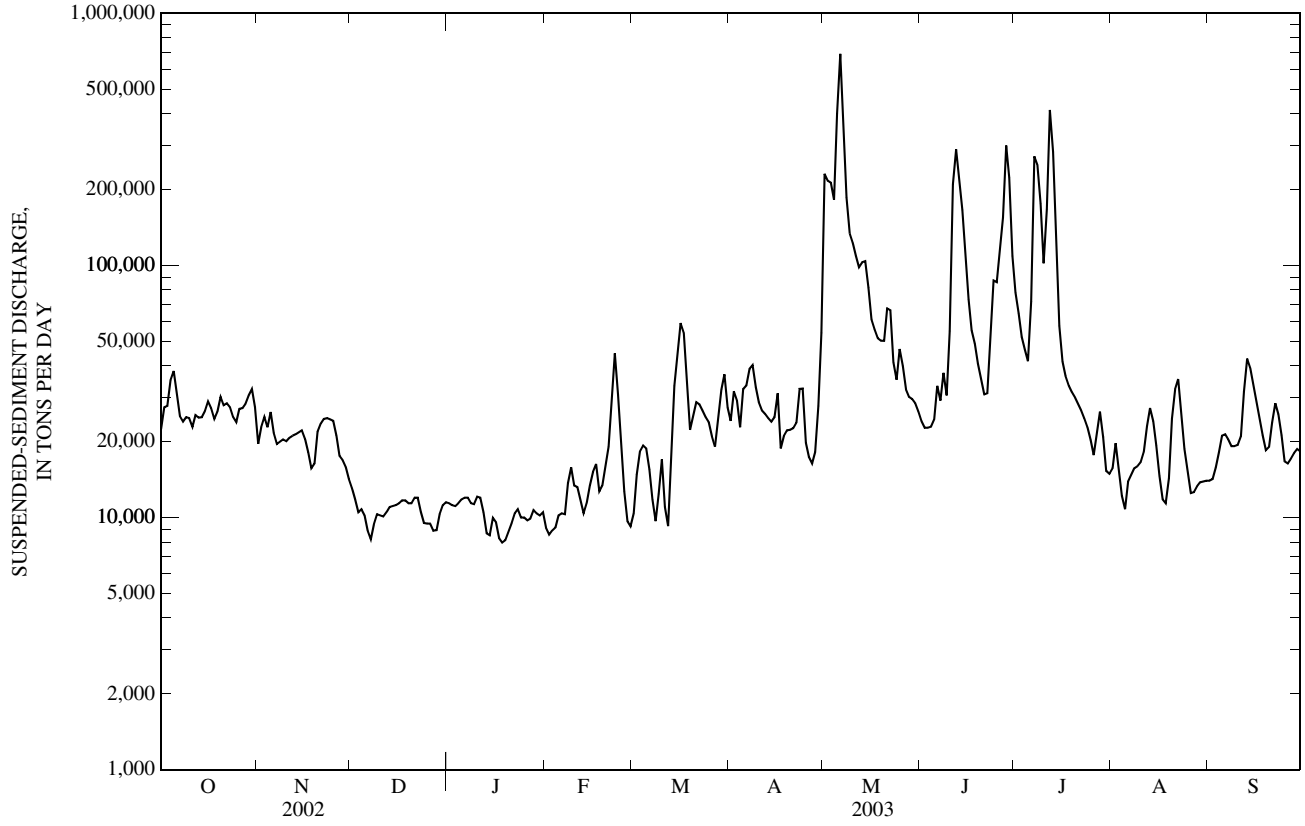
Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	240	22,400	204	19,600	205	13,100	214	11,400	179	9,110	229	10,400
2	275	27,400	239	22,800	195	11,800	212	11,200	171	8,560	269	14,800
3	281	27,700	266	25,100	189	10,500	210	11,100	168	8,890	310	18,300
4	343	35,000	247	22,800	192	10,800	212	11,400	169	9,140	320	19,300
5	352	38,100	286	26,200	180	10,200	214	11,800	186	10,200	314	18,800
6	301	30,900	241	21,700	175	8,890	214	12,000	191	10,400	270	15,500
7	256	25,200	217	19,600	173	8,200	215	12,000	193	10,300	223	11,800
8	247	24,000	222	20,000	182	9,380	210	11,400	233	13,700	206	9,680
9	255	25,000	228	20,400	191	10,300	208	11,300	257	15,800	238	12,400
10	252	24,800	225	20,100	191	10,200	214	12,100	234	13,400	293	17,000
11	237	22,900	233	20,700	191	10,100	213	12,000	233	13,200	205	11,000
12	259	25,500	239	21,100	194	10,500	206	10,500	224	11,700	191	9,240
13	255	24,900	244	21,400	197	11,000	198	8,660	212	10,400	317	18,800
14	258	25,000	249	21,800	200	11,100	197	8,510	222	11,400	481	33,300
15	272	26,400	252	22,200	204	11,200	205	9,980	241	13,400	603	45,800
16	300	28,900	232	20,500	207	11,400	202	9,590	253	15,200	716	59,100
17	281	27,200	206	18,100	210	11,700	195	8,270	261	16,300	721	54,000
18	254	24,600	184	15,700	208	11,700	190	7,950	221	12,700	562	36,300
19	270	26,300	189	16,400	204	11,400	193	8,130	228	13,400	328	22,300
20	305	30,100	250	21,900	205	11,400	198	8,770	267	16,000	325	25,400
21	286	27,900	269	23,600	209	12,000	202	9,480	302	19,100	338	28,700
22	291	28,400	279	24,600	208	12,000	207	10,400	386	30,500	331	28,100
23	281	27,400	278	24,800	198	10,500	208	10,800	464	44,800	321	26,600
24	258	25,100	277	24,500	193	9,520	203	10,000	397	30,700	310	25,000
25	244	23,900	268	24,200	194	9,470	202	10,000	307	18,700	296	23,900
26	276	27,000	238	21,100	194	9,470	200	9,740	252	12,700	259	21,000
27	278	27,200	210	17,600	190	8,870	200	9,900	219	9,660	238	19,100
28	289	28,300	215	16,900	193	8,920	205	10,700	217	9,230	308	25,100
29	310	30,500	223	15,900	206	10,300	196	10,400	---	---	380	32,200
30	321	32,300	215	14,200	214	11,200	192	10,200	---	---	425	37,000
31	276	27,400	---	---	216	11,500	194	10,500	---	---	316	27,300
TOTAL	---	847,700	---	625,500	---	328,620	---	320,180	---	418,590	---	757,220

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.—Continued

SUSPENDED-SEDIMENT—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)	Mean concentration (mg/l)	Load (tons/day)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	280	24,200	1,960	231,000	250	24,100	635	78,100	192	15,700	196	14,000
2	361	31,700	1,910	217,000	237	22,700	537	64,500	240	19,700	200	14,200
3	334	29,200	1,910	213,000	239	22,700	446	52,100	193	15,600	223	15,800
4	262	22,800	1,690	182,000	244	22,900	407	46,300	151	12,200	247	18,200
5	367	32,300	2,850	401,000	261	24,500	378	41,700	135	10,800	267	21,100
6	380	33,400	4,060	691,000	348	33,300	624	71,800	173	13,900	257	21,400
7	436	38,900	2,800	401,000	307	29,100	2,050	271,000	184	14,800	239	20,400
8	447	40,200	1,450	186,000	385	37,500	1,850	251,000	191	15,700	224	19,200
9	372	32,900	1,060	134,000	313	30,500	1,460	176,000	199	16,000	221	19,200
10	326	28,700	994	123,000	551	54,900	867	102,000	207	16,600	220	19,400
11	303	26,600	894	109,000	1,790	210,000	1,220	167,000	223	18,200	228	21,000
12	290	25,800	820	98,400	2,270	289,000	2,810	414,000	284	23,000	315	31,600
13	278	24,800	870	103,000	1,870	220,000	2,130	282,000	340	27,200	402	42,700
14	267	24,000	869	104,000	1,500	166,000	1,210	144,000	311	24,100	374	39,300
15	278	25,000	687	81,600	1,040	108,000	508	57,600	262	19,300	326	33,100
16	345	31,100	522	61,200	731	73,300	390	41,600	214	14,600	293	28,500
17	215	18,800	481	55,700	566	55,300	355	36,400	179	11,800	262	24,600
18	232	21,100	454	51,400	504	48,900	342	33,400	174	11,400	232	21,200
19	242	22,200	450	50,300	417	40,900	333	31,500	203	14,300	205	18,500
20	242	22,300	452	50,200	361	35,300	325	30,000	333	24,700	215	19,100
21	243	22,600	590	67,600	330	30,800	315	28,300	427	32,300	267	23,800
22	256	23,800	607	66,500	335	31,100	299	26,600	473	35,400	321	28,400
23	346	32,400	389	41,300	529	52,200	282	24,700	351	25,700	302	25,700
24	346	32,500	333	35,200	836	87,100	264	22,800	258	18,700	250	21,200
25	216	19,800	443	46,600	838	85,900	236	20,300	212	15,100	198	16,700
26	194	17,400	385	39,900	935	112,000	212	17,700	173	12,500	197	16,400
27	183	16,400	312	32,200	1,170	155,000	262	21,700	175	12,600	208	17,100
28	204	18,200	297	30,100	2,220	299,000	314	26,300	184	13,300	219	18,000
29	308	27,700	291	29,500	1,700	223,000	249	20,800	191	13,800	230	18,700
30	578	54,000	284	28,400	863	109,000	188	15,300	193	13,900	226	18,300
31	---	---	268	26,300	---	---	183	14,900	194	14,000	---	---
TOTAL	---	820,800	---	3,987,400	---	2,734,000	---	2,631,400	---	546,900	---	666,800
YEAR	14,685,110											

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.—Continued



THIS PAGE IS INTENTIONALLY BLANK

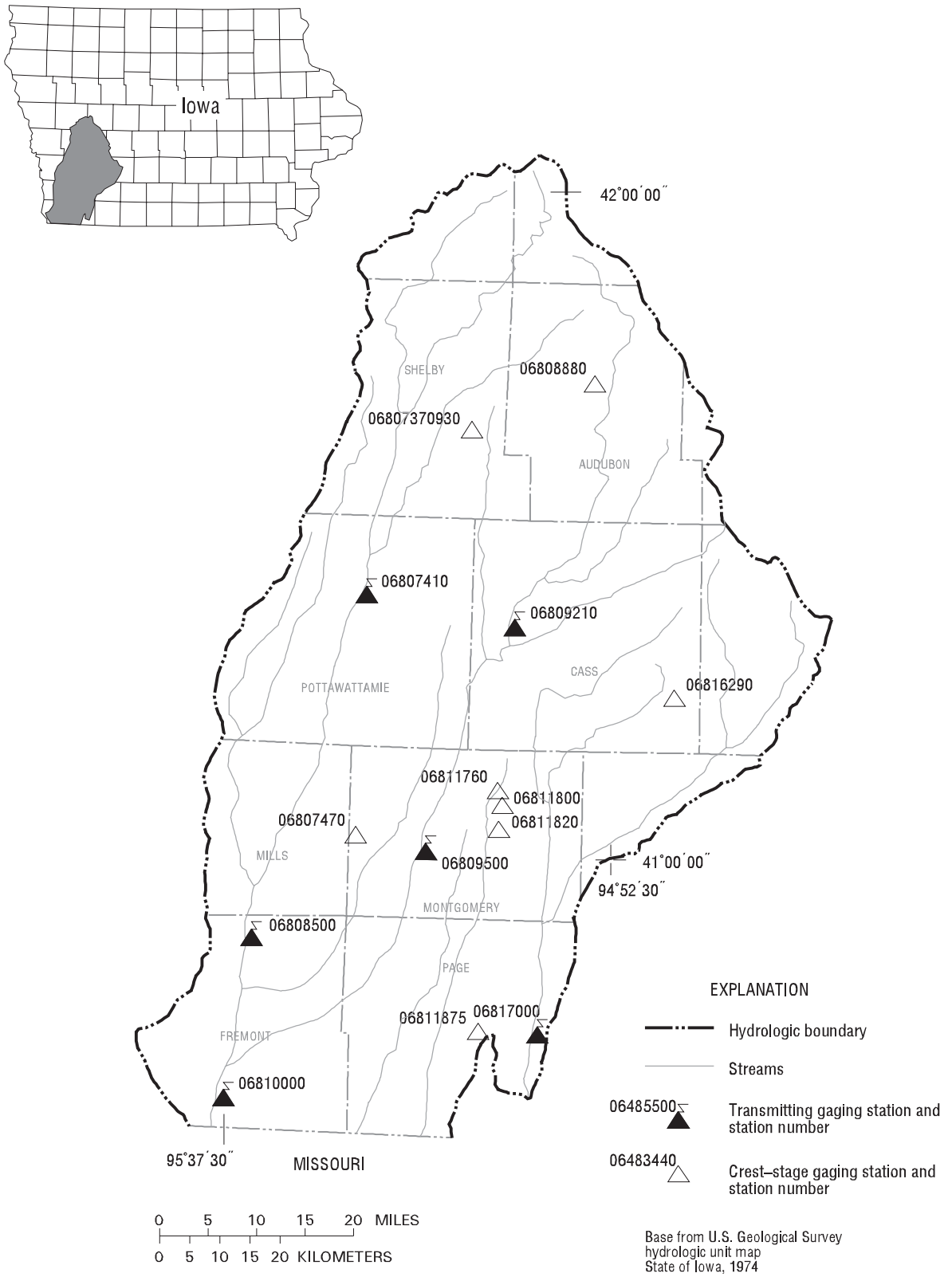


Figure 19. Locations of active continuous-record and crest-stage gaging stations in the Nishnabotna River, Nodaway River, and Missouri River Main Stem drainage basins.

Gaging Stations

06807410 West Nishnabotna River at Hancock, IA 426
06808500 West Nishnabotna River at Randolph, IA 428
06809210 East Nishnabotna River near Atlantic, IA 430
06809500 East Nishnabotna River at Red Oak, IA 432
06810000 Nishnabotna River above Hamburg, IA 434
06813500 Missouri River at Rulo, NE (not plotted on map) 436
06817000 Nodaway River at Clarinda, IA 438

Crest Stage Gaging Stations

0680737930 Elm Creek near Jacksonville, IA 465
06807470 Indian Creek near Emerson, IA 465
06808880 Bluegrass Creek at Audubon, IA 465
06811760 Tarkio River near Elliott, IA 465
06811800 East Tarkio Creek near Stanton, IA 465
06811820 Tarkio River Tributary near Stanton, IA 465
06811875 Snake Creek near Yorktown, IA 466
06816290 West Nodaway River at Massena, IA 466

06807410 WEST NISHNABOTNA RIVER AT HANCOCK, IA

LOCATION.--Lat 41°23'24",long 95°22'17",in NW¼ NE¼ sec.18, T.76 N., R.39 W., Pottawattamie County, Hydrologic Unit 10240002, on right bank at upstream side of bridge on county highway G30, 0.6 mi west of Hancock school, 3.0 mi downstream from Jim Creek, 59.6 mi upstream from confluence with East Nishnabotna River, and at mile 75.1 mi upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--609 mi^2.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,085.83 ft above NGVD of 1929. Prior to Sept. 15, 1980, on downstream end of right pier at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	90	e81	e88	e72	e98	86	822	298	256	179	80
2	82	90	e77	e79	e72	e77	83	454	307	250	173	79
3	279	93	e75	e71	e68	e84	80	352	328	244	166	77
4	259	92	e88	e81	e61	e50	82	2,410	309	235	161	74
5	399	94	e75	e79	e55	e44	84	2,940	298	233	158	73
6	199	95	e82	e69	e48	e56	85	1,340	309	364	153	72
7	153	94	e87	e62	e41	e67	89	993	306	439	147	71
8	134	94	e83	e82	e49	e58	91	833	371	353	143	69
9	122	93	e69	e57	e48	e50	92	1,050	333	1,210	138	69
10	112	92	e62	e40	e47	e65	95	814	460	1,560	134	69
11	106	89	e71	e40	e55	e124	107	779	428	571	131	75
12	101	88	e65	e45	e54	e213	126	698	356	443	136	88
13	96	89	e64	e55	e57	e405	112	642	339	388	126	93
14	93	92	e67	e68	e87	e360	98	1,050	318	356	122	74
15	91	91	e76	e67	e125	e542	90	707	302	332	121	68
16	91	89	e86	e61	e145	e408	89	623	294	306	117	66
17	92	88	e90	e57	e155	e271	86	569	288	289	113	63
18	92	90	e90	e70	e166	202	83	532	292	277	110	63
19	87	90	e90	e80	e161	171	87	514	286	268	106	67
20	84	89	e84	e72	e199	156	98	502	269	262	103	66
21	85	88	e77	e64	e355	142	93	451	259	265	102	68
22	84	88	e77	e59	e552	127	82	435	262	243	97	85
23	84	88	e71	e46	e157	117	78	427	349	238	94	83
24	90	87	e75	e56	e103	111	82	410	272	227	93	66
25	94	80	e77	e58	e76	106	86	398	264	216	90	59
26	93	e74	e82	e42	e86	101	85	375	313	206	89	57
27	89	e70	e90	e52	e82	100	78	358	273	200	86	56
28	90	e78	e92	e59	e95	102	78	351	293	213	86	56
29	94	e84	e93	e57	---	97	82	352	345	202	83	56
30	94	e75	e91	e62	---	90	1,550	338	270	192	80	55
31	94	---	e83	e64	---	88	---	315	---	188	80	---
TOTAL	3,719	2,634	2,470	1,942	3,271	4,682	4,137	22,834	9,391	11,026	3,717	2,097
MEAN	120	87.8	79.7	62.6	117	151	138	737	313	356	120	69.9
MAX	399	95	93	88	552	542	1,550	2,940	460	1,560	179	93
MIN	56	70	62	40	41	44	78	315	259	188	80	55
AC-FT	7,380	5,220	4,900	3,850	6,490	9,290	8,210	45,290	18,630	21,870	7,370	4,160
CFSM	0.20	0.14	0.13	0.10	0.19	0.25	0.23	1.21	0.51	0.58	0.20	0.11
IN.	0.23	0.16	0.15	0.12	0.20	0.29	0.25	1.39	0.57	0.67	0.23	0.13

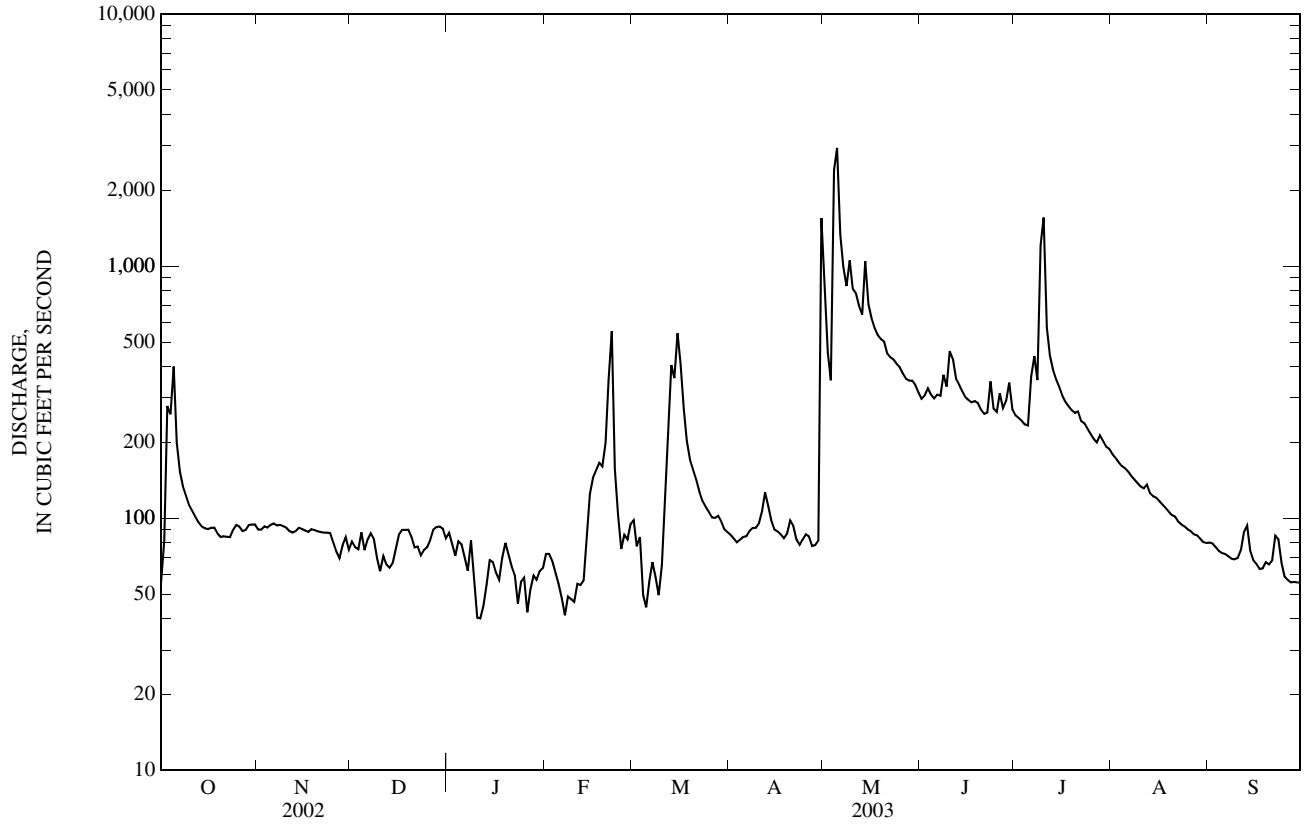
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2003, BY WATER YEAR (WY)

MEAN	188	177	153	121	268	507	419	508	592	417	240	282
MAX	998	910	628	625	993	1,946	1,295	1,586	2,228	2,925	1,073	2,412
(WY)	(1987)	(1973)	(1973)	(1973)	(1983)	(1979)	(1983)	(1973)	(1998)	(1993)	(1996)	(1972)
MIN	30.2	32.1	17.9	4.58	27.2	40.3	45.6	30.1	26.7	38.4	26.4	14.7
(WY)	(2001)	(1971)	(1971)	(1971)	(1967)	(1968)	(1968)	(1967)	(1977)	(1970)	(1968)	(1971)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1960 - 2003	
ANNUAL TOTAL	47,222		71,920			
ANNUAL MEAN	129		197		323	
HIGHEST ANNUAL MEAN					966	1993
LOWEST ANNUAL MEAN					42.4	1968
HIGHEST DAILY MEAN	1,130	Jun 13	2,940	May 5	23,300	Sep 12, 1972
LOWEST DAILY MEAN	16	Feb 27	40	Jan 10b	2.2	Feb 8, 1971a
ANNUAL SEVEN-DAY MINIMUM	25	Feb 26	49	Feb 6	2.5	Feb 4, 1971
MAXIMUM PEAK FLOW			6,960	May 4	30,100	Jul 10, 1993
MAXIMUM PEAK STAGE			11.92	May 4	23.52	Jul 10, 1993
ANNUAL RUNOFF (AC-FT)	93,660		142,700		233,700	
ANNUAL RUNOFF (CFSM)	0.21		0.32		0.53	
ANNUAL RUNOFF (INCHES)	2.88		4.39		7.20	
10 PERCENT EXCEEDS	241		398		715	
50 PERCENT EXCEEDS	91		92		158	
90 PERCENT EXCEEDS	55		61		36	

06807410 WEST NISHNABOTNA RIVER AT HANCOCK, IA—Continued

a Also Feb. 9, 1971.
b Also Jan. 11; Ice affected.
e Estimated.



06808500 WEST NISHNABOTNA RIVER AT RANDOLPH, IA

LOCATION.--Lat 40°52'23", long 95°34'48", in NE¼ NE¼ sec.17, T.70 N., R.41 W., Fremont County, Hydrologic Unit 10240002, on right bank at upstream side of bridge on State Highway 184, 0.3 mi downstream from Deer Creek, 0.5 mi west of Randolph, and 16.0 mi upstream from confluence with East Nishnabotna River, and at mile 31.5 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--1,326 mi^2.

PERIOD OF RECORD.--June 1948 to current year.

REVISED RECORDS.--WSP 1440: Drainage area. WDR IA-74-1: 1973 (M). WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 932.99 ft above NGVD of 1929, unadjusted. Prior to Aug. 26, 1955, nonrecording gage with supplementary water-stage recorder operating above 8.4 ft. June 30, 1949 to Aug. 25, 1955 at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform and rain gage at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of about 24 ft, discharge not determined, from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121	179	e139	e149	e139	e192	197	1,910	617	530	316	137
2	207	177	e134	e140	e139	e170	194	1,050	629	513	310	130
3	198	176	e131	e134	e133	e180	195	685	645	512	296	127
4	627	176	e135	e143	e126	e180	196	583	639	505	285	120
5	422	181	e131	e139	e125	e154	197	3,980	619	496	277	116
6	490	180	e142	e130	e124	e152	203	2,480	615	601	272	113
7	323	180	e151	e124	e111	e170	236	1,630	612	757	267	109
8	255	179	e148	e144	e130	e167	233	1,400	613	717	263	104
9	223	176	e138	e115	e125	e148	224	2,290	664	759	254	105
10	205	174	e133	e102	e119	e148	226	1,640	728	1,750	248	108
11	193	168	e146	e102	e143	e150	224	1,290	785	1,510	260	113
12	183	166	e141	e108	e137	e170	225	1,190	770	869	239	133
13	177	166	e141	e116	e145	e350	240	1,110	679	673	234	134
14	173	169	e144	e131	e174	e400	239	1,080	643	586	226	136
15	167	168	156	e129	e209	e620	226	1,630	609	533	216	123
16	171	167	165	e123	e194	e879	221	1,140	592	491	209	108
17	179	166	171	e118	e205	e645	216	1,040	581	474	203	105
18	173	168	177	e131	e220	473	216	966	576	446	197	103
19	166	166	173	e139	e210	395	221	943	781	432	189	107
20	163	167	163	e133	e250	372	224	922	640	425	184	104
21	160	169	154	e127	e401	328	227	870	574	417	178	109
22	157	167	134	e122	e632	295	217	811	565	407	173	128
23	160	166	e133	e107	e377	275	203	789	583	385	167	130
24	171	168	e137	e118	e222	261	211	792	642	375	160	140
25	185	160	e139	e122	e187	247	214	771	658	361	152	117
26	185	159	e144	e106	e190	238	202	731	586	345	149	105
27	179	141	e152	e117	e178	234	199	700	599	334	146	99
28	179	135	e154	e123	e198	230	197	686	575	331	143	95
29	174	e141	e153	e123	---	223	221	673	547	327	140	95
30	182	e131	e153	e129	---	214	260	666	600	334	139	97
31	183	---	e145	e128	---	204	---	665	---	319	141	---
TOTAL	6,731	4,986	4,557	3,872	5,543	8,864	6,504	37,113	18,966	17,514	6,633	3,450
MEAN	217	166	147	125	198	286	217	1,197	632	565	214	115
MAX	627	181	177	149	632	879	260	3,980	785	1,750	316	140
MIN	121	131	131	102	111	148	194	583	547	319	139	95
AC-FT	13,350	9,890	9,040	7,680	10,990	17,580	12,900	73,610	37,620	34,740	13,160	6,840
CFSM	0.16	0.13	0.11	0.09	0.15	0.22	0.16	0.90	0.48	0.43	0.16	0.09
IN.	0.19	0.14	0.13	0.11	0.16	0.25	0.18	1.04	0.53	0.49	0.19	0.10

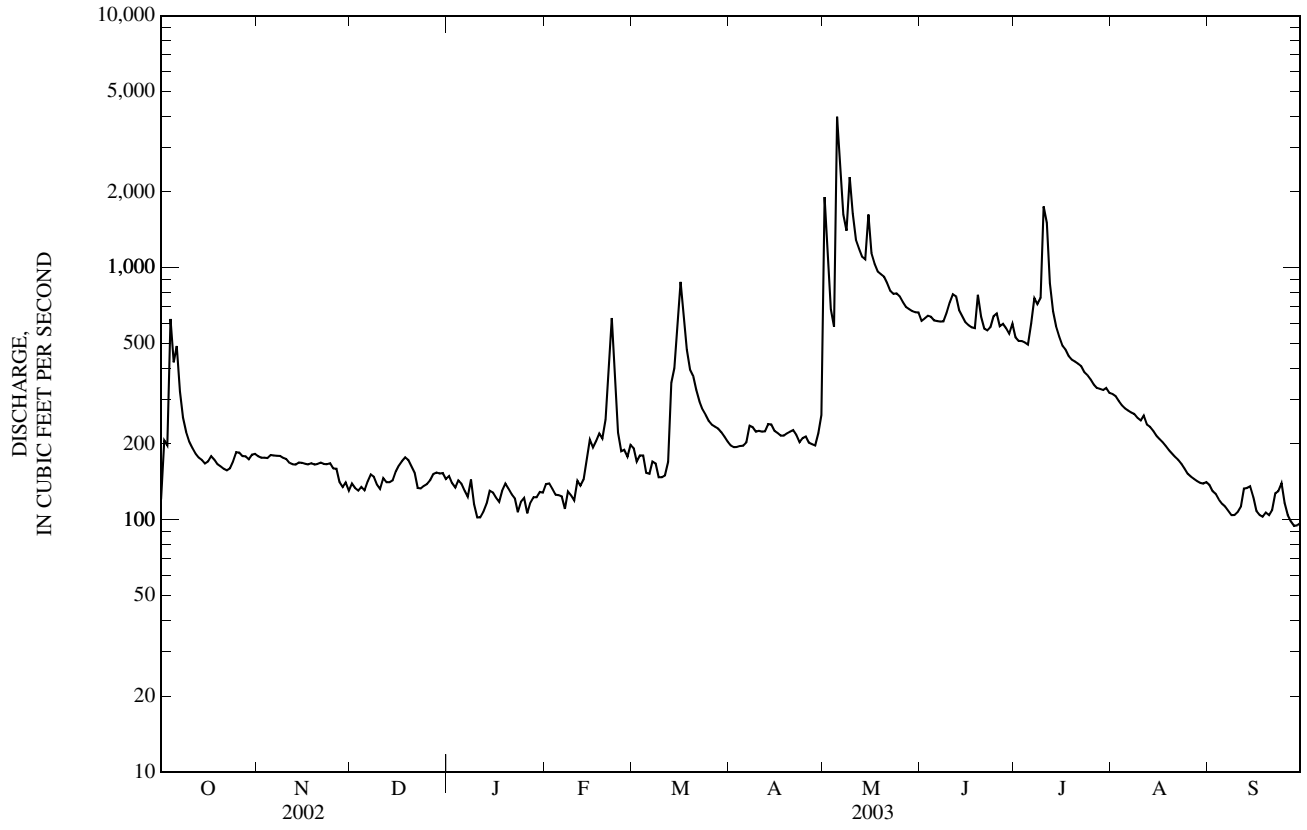
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2003, BY WATER YEAR (WY)

MEAN	377	348	299	265	532	937	795	1,050	1,243	875	584	515
MAX	2,002	1,277	1,140	1,201	1,777	3,877	2,867	3,227	5,031	6,357	2,610	2,531
(WY)	(1987)	(1973)	(1973)	(1973)	(1973)	(1979)	(1973)	(1973)	(1998)	(1993)	(1993)	(1972)
MIN	27.1	33.6	20.6	17.4	19.4	67.8	42.7	97.3	65.6	71.2	30.1	41.0
(WY)	(1956)	(1956)	(1956)	(1956)	(1956)	(1956)	(1956)	(1967)	(1956)	(1954)	(1955)	(1955)

06808500 WEST NISHNABOTNA RIVER AT RANDOLPH, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1949 - 2003	
ANNUAL TOTAL	89,467		124,733			
ANNUAL MEAN	245		342		652	
HIGHEST ANNUAL MEAN					1,985	1993
LOWEST ANNUAL MEAN					111	1968
HIGHEST DAILY MEAN	1,360	May 13	3,980	May 5	25,800	Jun 15, 1998
LOWEST DAILY MEAN	104	Sep 17	95	Sep 28c	10	Dec 17, 1955a
ANNUAL SEVEN-DAY MINIMUM	111	Sep 24	107	Sep 24	11	Dec 16, 1955
MAXIMUM PEAK FLOW			5,500	May 5	40,800	May 26, 1987
MAXIMUM PEAK STAGE			15.00	May 5	24.80	Mar 5, 1949b
INSTANTANEOUS LOW FLOW			91	Sep 28c		
ANNUAL RUNOFF (AC-FT)	177,500		247,400		472,100	
ANNUAL RUNOFF (CFSM)	0.18		0.26		0.49	
ANNUAL RUNOFF (INCHES)	2.51		3.50		6.68	
10 PERCENT EXCEEDS	413		692		1,410	
50 PERCENT EXCEEDS	189		189		339	
90 PERCENT EXCEEDS	134		123		92	

a Also Dec. 18-21, 1955.
b From graph based on gage readings, backwater from ice.
c Also Sept. 29.
e Estimated.



06809210 EAST NISHNABOTNA RIVER NEAR ATLANTIC, IA

LOCATION.--Lat 41°20'46", long 95°04'36", in NW¼ NW¼ sec.35, T.76 N., R.37 W., Cass County, Hydrologic Unit 10240003, on left bank at downstream side of bridge on county highway, 1.6 mi upstream from Turkey Creek, 5.2 mi southwest of junction of U.S. Highway 6 and State Highway 83 in Atlantic, 69.1 mi upstream from confluence with West Nishnabotna River, and at mile 84.6 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--436 mi^2.

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,105.83 ft above NGVD of 1929. Prior to Oct. 1, 1970, at site 2.2 mi upstream at datum 5.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 2, 1958 reached a stage of 22.49 ft, from floodmark, discharge, 34,200 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	40	43	e59	e50	e71	51	1,280	215	134	95	34
2	41	40	45	e50	e50	e50	48	661	221	131	93	34
3	44	41	42	e44	e43	e57	46	475	233	126	89	33
4	227	40	e49	e53	e34	e27	47	969	220	119	84	31
5	304	42	e37	e51	e29	e22	50	3,160	211	113	84	31
6	109	43	e43	e44	e22	e33	51	1,180	215	155	82	30
7	81	43	e48	e36	e17	e43	57	854	219	211	77	30
8	68	43	e43	e52	e27	e34	56	711	216	146	76	30
9	57	42	e37	e30	e25	e27	59	1,370	213	245	71	30
10	51	43	e35	e18	e24	e39	63	839	334	492	70	31
11	47	40	e42	e18	e27	e94	85	729	314	228	89	38
12	43	38	e38	e22	e27	e145	115	600	263	185	77	46
13	42	39	e35	e30	e31	e185	98	539	246	168	67	43
14	42	39	e38	e42	e53	e351	83	864	228	151	65	36
15	41	38	e40	e40	e63	e480	75	665	215	143	62	31
16	41	38	42	e35	e53	262	72	552	208	135	61	30
17	43	38	41	e32	e66	170	70	477	201	129	59	28
18	42	39	41	e43	e77	118	71	416	200	123	e53	28
19	39	38	39	e52	e72	101	78	380	242	121	e48	29
20	37	39	37	e46	e84	96	96	357	201	120	e44	28
21	38	40	29	e37	e236	88	109	328	184	122	43	37
22	37	38	e30	e33	e308	77	91	320	179	115	41	36
23	36	38	e27	e21	e171	70	82	315	181	114	39	31
24	40	37	e31	e30	e98	64	84	306	173	111	37	27
25	47	e36	e36	e33	e53	61	90	297	167	108	36	25
26	43	e35	e44	e19	e60	59	90	279	180	103	34	24
27	41	e35	e52	e29	e59	61	83	267	158	101	34	23
28	42	51	e61	e36	e68	64	83	260	152	103	34	22
29	42	49	e62	e35	---	60	88	251	164	104	33	23
30	42	40	e61	e40	---	56	1,300	244	142	101	32	23
31	40	---	e55	e42	---	53	---	228	---	100	34	---
TOTAL	1,870	1,202	1,303	1,152	1,927	3,118	3,471	20,173	6,295	4,557	1,843	922
MEAN	60.3	40.1	42.0	37.2	68.8	101	116	651	210	147	59.5	30.7
MAX	304	51	62	59	308	480	1,300	3,160	334	492	95	46
MIN	23	35	27	18	17	22	46	228	142	100	32	22
AC-FT	3,710	2,380	2,580	2,280	3,820	6,180	6,880	40,010	12,490	9,040	3,660	1,830
CFSM	0.14	0.09	0.10	0.09	0.16	0.23	0.27	1.49	0.48	0.34	0.14	0.07
IN.	0.16	0.10	0.11	0.10	0.16	0.27	0.30	1.72	0.54	0.39	0.16	0.08

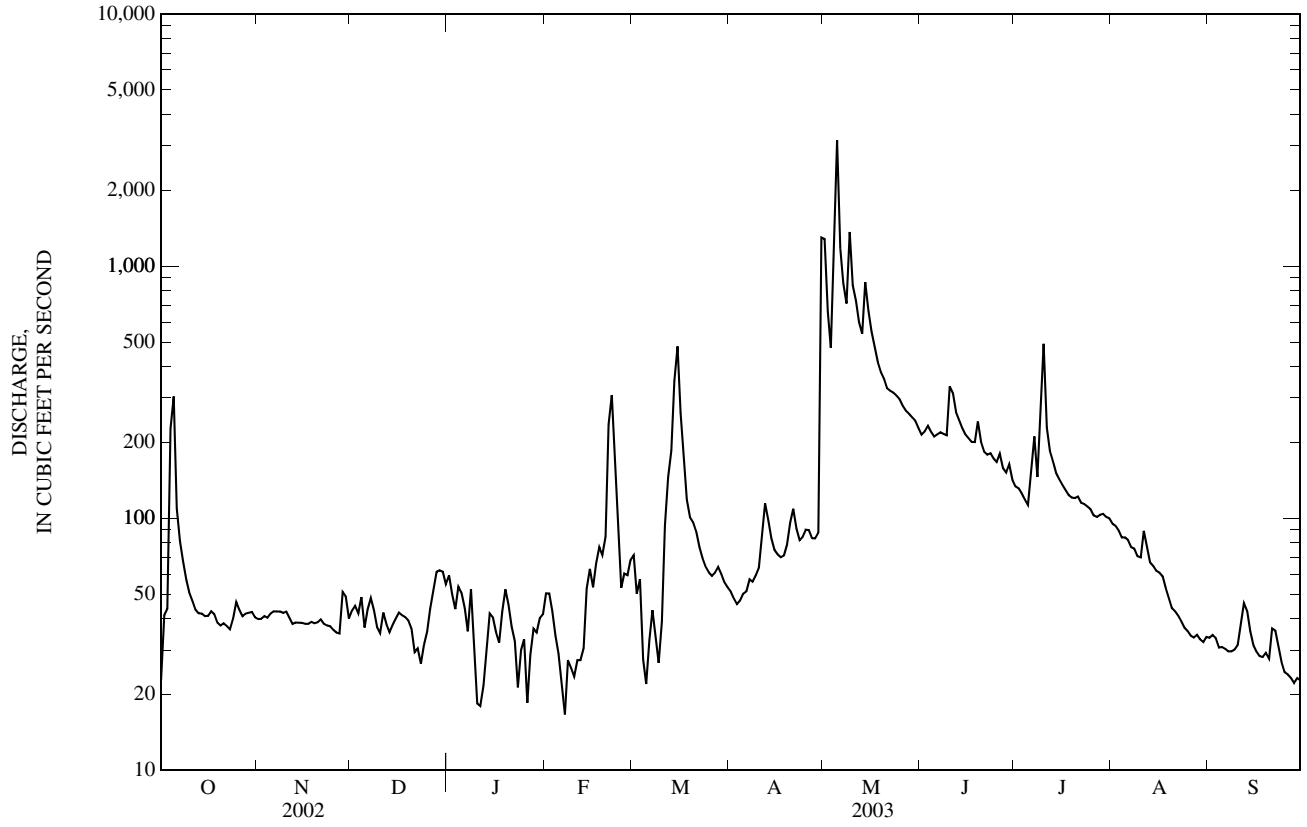
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2003, BY WATER YEAR (WY)

MEAN	137	131	107	88.5	196	395	361	421	501	339	173	201
MAX	1,069	757	529	529	812	1,378	1,138	1,208	3,125	2,747	1,394	1,855
(WY)	(1987)	(1973)	(1993)	(1973)	(1971)	(1965)	(1973)	(1986)	(1998)	(1993)	(1993)	(1972)
MIN	21.0	20.3	10.6	7.68	18.7	28.4	27.9	15.0	23.4	15.6	13.4	14.8
(WY)	(1967)	(1969)	(1964)	(1971)	(1968)	(1968)	(1981)	(1967)	(1977)	(1968)	(1968)	(1971)

06809210 EAST NISHNABOTNA RIVER NEAR ATLANTIC, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1961 - 2003	
ANNUAL TOTAL	23,904		47,833			
ANNUAL MEAN	65.5		131		254	
HIGHEST ANNUAL MEAN					842	1993
LOWEST ANNUAL MEAN					23.7	1968
HIGHEST DAILY MEAN	1,730	Aug 23	3,160	May 5	32,300	Jun 15, 1998
LOWEST DAILY MEAN	14	Feb 2	17	Feb 7a	2.5	Jul 10, 1977
ANNUAL SEVEN-DAY MINIMUM	20	Jan 30	24	Sep 24	7.0	Dec 17, 1963
MAXIMUM PEAK FLOW			4,890	May 5	41,400	Jun 15, 1998
MAXIMUM PEAK STAGE			9.49	May 5	22.81	Sep 12, 1972
INSTANTANEOUS LOW FLOW			17	Feb 7		
ANNUAL RUNOFF (AC-FT)	47,410		94,880		184,100	
ANNUAL RUNOFF (CFSM)	0.15		0.30		0.58	
ANNUAL RUNOFF (INCHES)	2.04		4.08		7.92	
10 PERCENT EXCEEDS	107		262		564	
50 PERCENT EXCEEDS	42		53		101	
90 PERCENT EXCEEDS	26		30		24	

a Ice affected.
e Estimated.



06809500 EAST NISHNABOTNA RIVER AT RED OAK, IA

LOCATION.--Lat 41°00'31", long 95°14'29", in NW¼ SE¼ sec.29, T.72 N., R.38 W., Montgomery County, Hydrologic Unit 10240003, on downstream side of Coolbaugh Street bridge in Red Oak, 0.2 mi upstream from Red Oak Creek, 38.0 mi upstream from confluence with West Nishnabotna River, and at mile 53.6 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--894 mi^2.

PERIOD OF RECORD.--May 1918 to November 1924, February 1925 to July 1925, May 1936 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 1240: 1921, 1922-23 (M), 1924, 1942 (M), 1944 (M), 1946. WSP 1440: Drainage area. WSP 1710: 1957.

GAGE.--Water-stage recorder. Datum of gage is 1,005.45 ft above NGVD of 1929. Prior to July 5, 1925, nonrecording gage at present site at datum 4.60 ft higher. May 29, 1936 to Nov. 13, 1952, nonrecording gage with supplementary water-stage recorder in operation above 3.2 ft gage height. July 30, 1939 to Nov. 13, 1952, and Nov. 14, 1952 to June 13, 1966, water-stage recorder, all at site 0.5 mi upstream at datum 5.00 ft higher. June 14, 1966 to Sept. 30, 1969, at present site at datum 5.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	81	57	e71	e67	e91	113	2,250	347	265	138	58
2	77	78	e53	e63	e67	e64	110	1,300	347	257	134	56
3	83	79	e53	e55	e63	e68	108	865	360	254	128	55
4	202	79	e58	e65	e56	e69	111	750	363	245	123	54
5	426	84	e55	e62	e53	e46	113	3,340	333	238	120	60
6	335	83	e63	e55	e43	e49	118	2,250	323	267	118	65
7	148	84	e75	e48	e32	e67	132	1,590	334	312	116	71
8	120	83	e74	e68	e42	e63	134	1,370	339	324	112	72
9	e110	81	e59	e49	e42	e47	132	1,820	348	296	110	72
10	e88	79	e56	e31	e37	e60	133	1,880	509	728	e106	72
11	e78	76	e68	e31	e44	e113	138	1,420	769	658	115	75
12	e68	75	e63	e35	e45	e130	160	1,240	627	358	116	83
13	e45	73	e64	e45	e52	e200	180	1,080	521	289	119	93
14	e45	73	72	e59	e79	e350	160	1,150	438	256	e102	85
15	e50	72	78	e56	e109	568	146	1,560	380	236	e94	77
16	e55	72	82	e51	e84	790	143	1,090	363	220	e88	73
17	e65	72	85	e47	e98	392	137	966	386	204	e81	72
18	78	73	86	e59	e125	274	136	865	399	193	e80	73
19	73	72	81	e69	e110	228	142	784	498	188	75	76
20	72	73	77	e62	e145	208	154	803	489	181	75	76
21	71	72	59	e54	e279	186	170	731	340	178	73	76
22	70	73	58	e49	e470	171	181	654	310	175	70	88
23	71	73	e53	e35	e437	147	161	617	307	166	67	86
24	77	71	e58	e46	e202	136	161	601	299	159	65	80
25	86	64	e61	e50	e136	131	157	576	288	151	63	72
26	88	66	e68	e34	e99	129	161	546	313	145	61	69
27	85	51	e74	e44	e81	127	160	493	332	141	60	67
28	83	63	e76	e51	e86	128	155	464	275	143	59	66
29	81	e74	e75	e50	---	127	169	445	263	140	58	62
30	85	e54	e74	e55	---	122	222	431	277	139	57	55
31	84	---	e67	e57	---	116	---	384	---	137	58	---
TOTAL	3,156	2,203	2,082	1,606	3,183	5,397	4,397	34,315	11,477	7,643	2,841	2,139
MEAN	102	73.4	67.2	51.8	114	174	147	1,107	383	247	91.6	71.3
MAX	426	84	86	71	470	790	222	3,340	769	728	138	93
MIN	45	51	53	31	32	46	108	384	263	137	57	54
AC-FT	6,260	4,370	4,130	3,190	6,310	10,700	8,720	68,060	22,760	15,160	5,640	4,240
CFSM	0.11	0.08	0.08	0.06	0.13	0.19	0.16	1.24	0.43	0.28	0.10	0.08
IN.	0.13	0.09	0.09	0.07	0.13	0.22	0.18	1.43	0.48	0.32	0.12	0.09

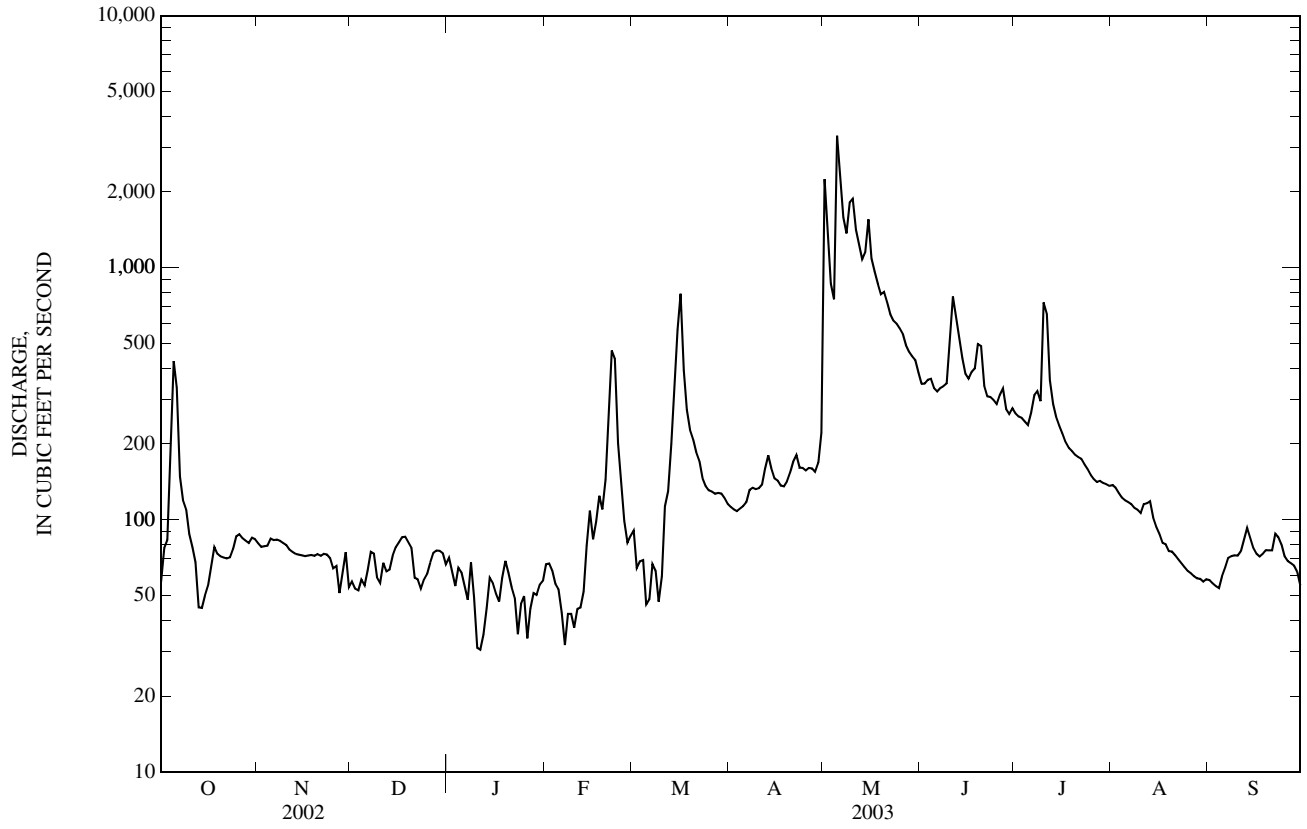
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 2003, BY WATER YEAR (WY)

MEAN	223	212	168	156	358	670	574	728	903	562	353	351
MAX	1,816	1,335	1,038	1,078	1,438	2,596	2,194	2,538	5,330	6,971	2,821	3,074
(WY)	(1987)	(1973)	(1993)	(1973)	(1973)	(1965)	(1973)	(1999)	(1998)	(1993)	(1993)	(1972)
MIN	16.5	19.9	14.6	12.3	17.2	32.3	30.4	35.2	40.5	24.5	17.0	14.9
(WY)	(1938)	(1940)	(1938)	(1940)	(1940)	(1938)	(1956)	(1939)	(1968)	(1936)	(1936)	(1937)

06809500 EAST NISHNABOTNA RIVER AT RED OAK, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1919 - 2003	
ANNUAL TOTAL	47,131		80,439			
ANNUAL MEAN	129		220		442	
HIGHEST ANNUAL MEAN					1,842	1993
LOWEST ANNUAL MEAN					54.9	1968
HIGHEST DAILY MEAN	2,290	Aug 24	3,340	May 5	45,100	Jun 15, 1998
LOWEST DAILY MEAN	39	Jan 30	31	Jan 10a	6.0	Aug 18, 1936
ANNUAL SEVEN-DAY MINIMUM	53	Sep 23	41	Feb 6	8.1	Dec 15, 1937
MAXIMUM PEAK FLOW			4,880	May 5	60,500	Jun 15, 1998
MAXIMUM PEAK STAGE			12.50	May 5	29.39	Jun 15, 1998
ANNUAL RUNOFF (AC-FT)	93,480		159,600		320,000	
ANNUAL RUNOFF (CFSM)	0.14		0.25		0.49	
ANNUAL RUNOFF (INCHES)	1.96		3.35		6.71	
10 PERCENT EXCEEDS	228		491		964	
50 PERCENT EXCEEDS	84		86		180	
90 PERCENT EXCEEDS	58		54		44	

a Also Jan. 11; Ice affected.
e Estimated.



06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA

LOCATION.--Lat 40°37'57", long 95°37'32", in SW¼ SE¼ sec.11, T.67 N., R.42 W., Fremont County, Hydrologic Unit 10240004, on left bank 1.7 mi downstream from confluence of East Nishnabotna and West Nishnabotna Rivers, 2 mi northeast of Hamburg, and at mile 13.8.

DRAINAGE AREA.--2,806 mi^2.

PERIOD OF RECORD.--March 1922 to September 1923, October 1928 to current year. Monthly discharge only for some periods published in WSP 1310.

REVISED RECORDS.--WSP 1240: 1923, 1929-37, 1938-40 (M), 1943 (M). WSP 1440: Drainage area. WDR IA-74-1: 1973.

GAGE.--Water-stage recorder. Datum of gage is 894.17 ft above NGVD of 1929. See WSP 1730 for history of changes prior to Nov. 16, 1950.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	154	317	e219	e235	e269	e401	362	1,620	1,170	932	521	217
2	251	310	e210	e226	e271	e348	348	3,290	1,150	875	513	206
3	346	316	e207	e207	e262	e364	339	2,020	1,180	847	493	192
4	710	309	210	e225	e253	e317	330	1,630	1,160	827	463	181
5	989	322	206	e219	e244	e264	336	3,830	1,150	799	449	175
6	843	320	212	e202	e239	e283	340	6,150	1,110	848	434	171
7	774	318	242	e189	e234	e317	394	3,740	1,110	1,030	429	171
8	443	315	238	e229	e242	e295	429	3,080	1,100	1,030	423	173
9	339	307	202	e189	e235	e276	407	4,730	1,120	1,090	410	177
10	295	297	e204	e157	e233	e301	400	3,990	1,200	1,470	395	179
11	273	284	e231	e157	e241	291	397	3,370	1,370	2,520	412	191
12	251	276	e222	e169	e238	340	394	2,810	1,710	1,590	416	213
13	222	273	e231	e189	e234	572	412	2,560	1,630	1,170	397	211
14	214	276	e259	e217	e313	829	461	2,420	1,350	1,000	403	215
15	235	273	e286	e208	e374	1,270	428	2,880	1,210	900	360	221
16	231	262	312	e196	e349	1,740	409	2,840	1,140	824	331	189
17	271	266	326	e186	e378	1,600	391	2,340	1,090	792	317	183
18	282	272	359	e212	e403	1,020	398	2,140	1,080	741	306	175
19	270	269	355	e231	e372	829	416	2,050	1,340	688	300	181
20	264	270	337	e218	e469	776	438	2,040	1,350	667	314	188
21	257	259	299	e207	e570	671	437	1,880	1,170	658	282	196
22	236	259	274	e196	e930	582	437	1,740	1,050	626	252	206
23	226	261	196	e172	e1,160	527	438	1,640	1,070	609	272	214
24	265	260	e211	e192	e768	481	443	1,610	1,070	581	238	227
25	318	241	e219	e198	e492	442	441	1,590	1,120	564	232	216
26	341	246	e228	e178	e422	418	412	1,490	1,040	537	226	192
27	318	227	e242	e196	e375	413	404	1,410	1,010	514	217	170
28	338	203	e243	e206	e395	399	402	1,340	1,040	629	215	169
29	320	232	e242	e205	---	389	430	1,300	956	549	218	176
30	333	e214	e242	e220	---	381	536	1,270	966	534	204	176
31	342	---	e229	e243	---	373	---	1,250	---	526	213	---
TOTAL	10,951	8,254	7,693	6,274	10,965	17,509	12,209	76,050	35,212	26,967	10,655	5,751
MEAN	353	275	248	202	392	565	407	2,453	1,174	870	344	192
MAX	989	322	359	243	1,160	1,740	536	6,150	1,710	2,520	521	227
MIN	154	203	196	157	233	264	330	1,250	956	514	204	169
AC-FT	21,720	16,370	15,260	12,440	21,750	34,730	24,220	150,800	69,840	53,490	21,130	11,410
CFSM	0.13	0.10	0.09	0.07	0.14	0.20	0.15	0.87	0.42	0.31	0.12	0.07
IN.	0.15	0.11	0.10	0.08	0.15	0.23	0.16	1.01	0.47	0.36	0.14	0.08

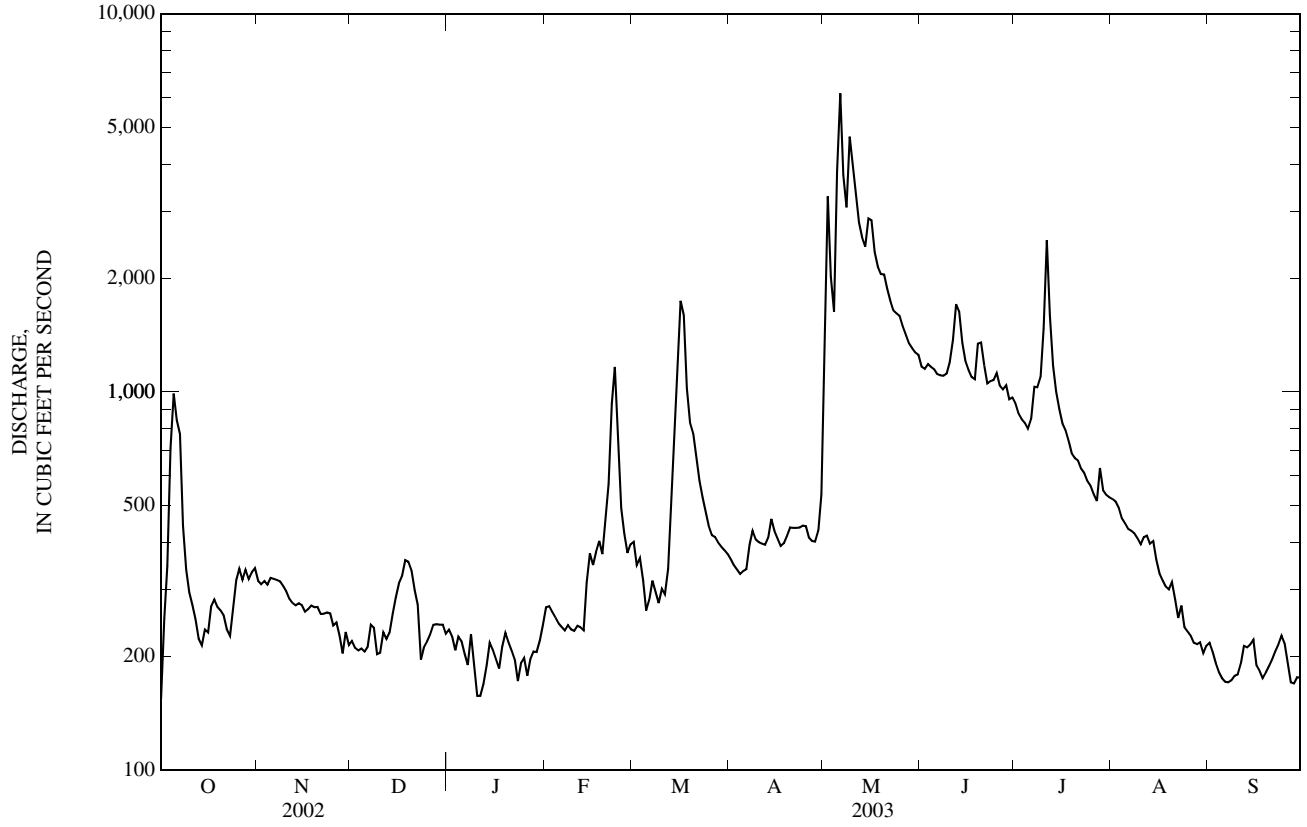
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2003, BY WATER YEAR (WY)

MEAN	665	664	555	554	1,024	1,803	1,499	1,914	2,559	1,674	1,087	981
MAX	5,004	3,083	2,557	3,585	4,720	7,229	5,866	6,621	16,430	17,780	6,266	7,385
(WY)	(1987)	(1973)	(1973)	(1973)	(1973)	(1979)	(1973)	(1995)	(1947)	(1993)	(1993)	(1993)
MIN	39.5	42.9	27.1	21.3	30.3	115	89.7	68.2	151	52.8	16.8	44.1
(WY)	(1938)	(1938)	(1938)	(1940)	(1940)	(1931)	(1956)	(1934)	(1956)	(1936)	(1934)	(1937)

06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1922 - 2003	
ANNUAL TOTAL	160,582		228,490			
ANNUAL MEAN	440		626		1,251	
HIGHEST ANNUAL MEAN					5,062	1993
LOWEST ANNUAL MEAN					170	1934
HIGHEST DAILY MEAN	2,930	May 13	6,150	May 6	53,700	Jun 17, 1998
LOWEST DAILY MEAN	125	Sep 26	154	Oct 1	4.5	Aug 30, 1934
ANNUAL SEVEN-DAY MINIMUM	139	Sep 25	175	Sep 4	9.9	Aug 24, 1934
MAXIMUM PEAK FLOW			7,140	May 6	65,100	Jun 17, 1998
MAXIMUM PEAK STAGE			19.40	May 6	33.18	Jun 17, 1998
INSTANTANEOUS LOW FLOW			139	Oct 1		
ANNUAL RUNOFF (AC-FT)	318,500		453,200		906,300	
ANNUAL RUNOFF (CFSM)	0.16		0.22		0.45	
ANNUAL RUNOFF (INCHES)	2.13		3.03		6.06	
10 PERCENT EXCEEDS	875		1,350		2,880	
50 PERCENT EXCEEDS	316		339		588	
90 PERCENT EXCEEDS	213		200		123	

e Estimated



06813500 MISSOURI RIVER AT RULO, NE

LOCATION.--Lat 40°03'13", long 95°25'19", in NW¼ NW¼ sec.17, T.1 N., R.18 E., Richardson County, Hydrologic Unit 10240005, on right bank at downstream side of bridge on U.S. Highway 159 at Rulo, 3.2 mi upstream from Big Nemaha River, and at mile 498.0.

DRAINAGE AREA.--414,900 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

PERIOD OF RECORD.--October 1949 to current year in reports of U.S. Geological Survey. Gage- height record collected at site 80 ft upstream January 1886 to December 1899 published in reports of Missouri River Commission; September 1929 to September 1950 in files of Kansas City office of U.S. Army Corps of Engineers.

GAGE.--Water-stage recorder. Datum of gage is 837.23 ft above NGVD of 1929. Oct. 1949 to Sept. 12, 1950, nonrecording gage at site 80 ft upstream and Sept. 13, 1950 to Apr. 19, 1983, recording gage on downstream end of middle pier, all at same datum.

REMARKS.--Records good, except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. U.S. Army Corps of Engineers satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 358,000 ft^3/s Apr. 22, 1952, gage height, 25.60 ft; minimum daily discharge, 4,420 ft^3/s Jan. 13, 1957; minimum gage height, -0.19 ft Dec. 25, 1990, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1881 reached a stage of 22.9 ft, from floodmark, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34,900	37,000	24,700	20,500	20,600	16,900	32,500	38,700	38,600	46,200	31,700	27,800
2	36,200	36,500	24,000	20,600	19,600	18,200	32,500	48,800	38,100	45,100	31,800	27,400
3	37,900	36,100	22,700	20,500	19,400	20,900	32,600	44,600	38,300	44,000	31,600	27,200
4	38,300	35,700	21,500	20,400	20,200	22,100	32,300	43,100	37,700	43,100	31,300	27,400
5	40,900	35,000	21,500	20,700	20,600	22,100	32,400	45,000	37,500	42,100	31,100	28,600
6	41,200	34,500	21,400	21,300	20,700	22,100	32,900	60,200	37,600	41,300	30,900	30,300
7	39,000	34,400	19,900	21,300	20,700	21,500	33,400	60,700	37,500	44,500	30,900	31,500
8	37,800	34,300	18,900	21,200	20,600	19,600	33,900	51,700	37,400	51,700	31,200	31,900
9	37,400	34,400	19,900	20,700	22,200	17,900	34,200	58,300	38,200	48,300	31,100	32,100
10	37,700	34,100	20,600	20,700	22,700	19,700	33,600	53,200	42,800	44,400	30,500	32,400
11	37,300	33,900	20,500	21,100	21,700	21,400	33,400	49,100	42,300	46,300	30,400	32,800
12	37,000	33,900	20,300	20,800	21,400	20,000	33,700	48,100	52,200	54,500	30,600	34,500
13	37,100	33,900	20,800	19,000	20,000	18,900	34,000	47,100	62,800	53,000	30,400	37,600
14	36,500	33,500	21,000	16,900	19,200	22,500	34,500	47,200	47,700	46,200	30,100	38,500
15	36,200	33,400	20,900	16,700	19,900	26,500	35,000	47,400	42,100	43,400	29,200	37,700
16	36,400	33,500	20,700	18,300	21,100	29,700	35,100	47,400	40,000	41,700	27,900	36,400
17	36,400	33,500	20,700	18,000	22,900	31,700	34,600	46,800	38,500	39,800	26,500	35,000
18	36,400	32,800	21,000	16,600	23,400	27,700	34,200	45,800	37,800	38,500	25,900	34,200
19	36,100	32,500	21,200	16,000	22,300	24,800	35,000	45,000	38,300	36,800	26,600	34,000
20	36,600	33,000	21,000	16,000	22,600	26,400	35,000	47,100	38,300	35,900	29,700	33,300
21	36,800	33,000	21,100	16,400	23,100	29,900	34,800	45,900	37,300	35,100	29,200	33,200
22	36,500	33,000	21,500	17,700	24,900	32,200	35,000	44,900	36,100	34,400	29,200	33,500
23	36,900	33,300	21,300	19,000	32,800	32,000	e35,200	43,100	38,900	34,000	28,800	32,600
24	36,800	33,400	20,000	19,400	35,200	31,300	35,300	42,000	43,300	33,300	28,300	31,800
25	36,700	33,700	19,000	18,900	28,000	30,600	35,100	41,900	41,400	33,000	27,900	31,500
26	36,900	33,900	19,000	18,800	22,800	31,100	34,700	41,200	41,800	32,800	27,600	31,300
27	36,800	33,100	19,000	18,700	18,900	30,700	34,700	40,500	47,900	32,000	27,700	31,000
28	36,600	31,100	18,500	18,900	17,200	30,300	34,800	40,000	50,400	32,000	27,700	30,800
29	36,600	29,100	18,500	19,800	---	31,000	35,300	39,400	50,900	32,300	27,700	31,000
30	37,300	26,500	19,600	20,200	---	32,400	36,000	39,400	48,400	32,000	27,700	30,800
31	37,900	---	20,300	20,400	---	32,900	---	38,900	---	31,700	27,800	---
TOTAL	1,153,100	1,006,000	641,000	595,500	624,700	795,000	1,025,700	1,432,500	1,260,100	1,249,400	909,000	968,100
MEAN	37,200	33,530	20,680	19,210	22,310	25,650	34,190	46,210	42,000	40,300	29,320	32,270
MAX	41,200	37,000	24,700	21,300	35,200	32,900	36,000	60,700	62,800	54,500	31,800	38,500
MIN	34,900	26,500	18,500	16,000	17,200	16,900	32,300	38,700	36,100	31,700	25,900	27,200
AC-FT	2,287,000	1,995,000	1,271,000	1,181,000	1,239,000	1,577,000	2,034,000	2,841,000	2,499,000	2,478,000	1,803,000	1,920,000
CFSM	0.09	0.08	0.05	0.05	0.05	0.06	0.08	0.11	0.10	0.10	0.07	0.08
IN.	0.10	0.09	0.06	0.05	0.06	0.07	0.09	0.13	0.11	0.11	0.08	0.09

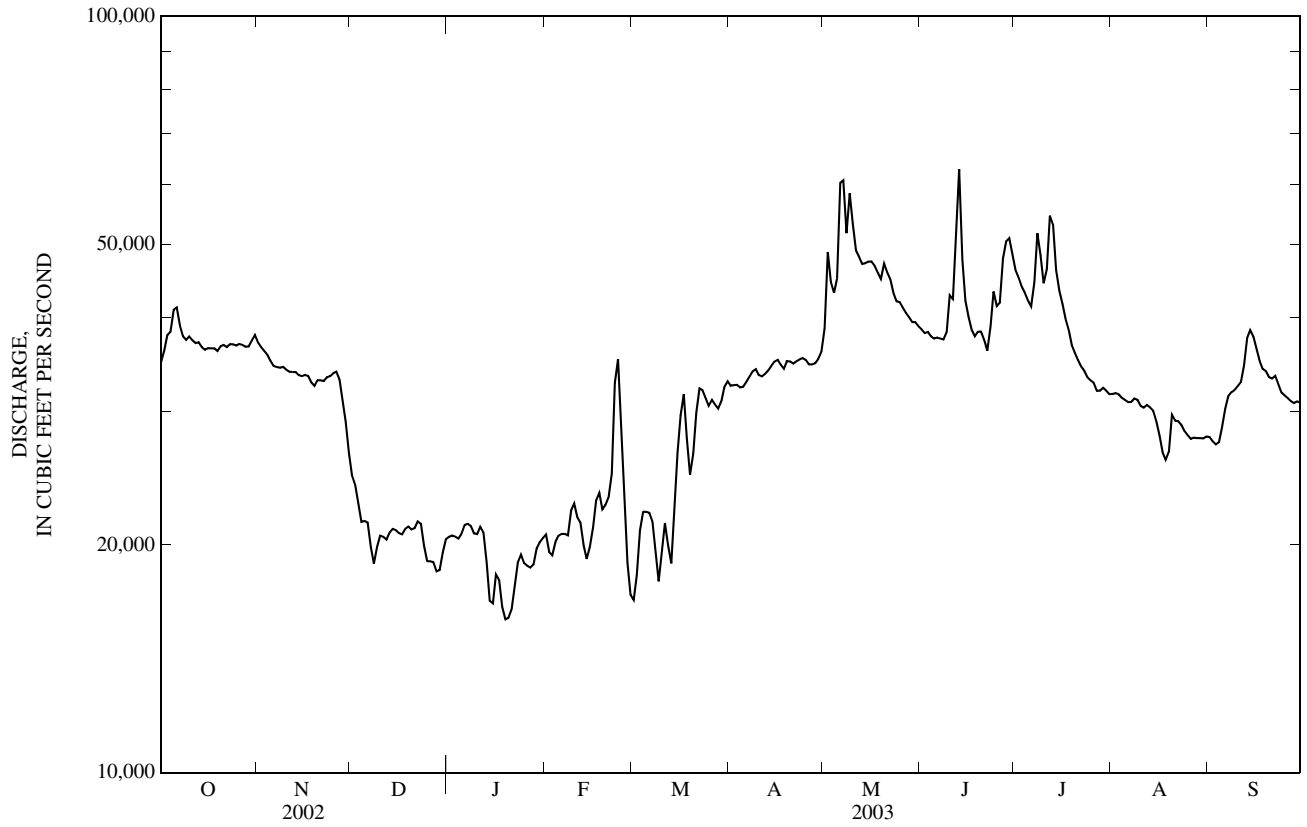
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2003, BY WATER YEAR (WY)

MEAN	44,640	40,950	27,220	22,800	28,470	40,890	51,040	51,790	56,420	50,520	44,590	44,810
MAX	80,050	83,880	57,380	42,280	53,140	79,590	106,100	97,280	130,600	164,800	78,730	76,410
(WY)	(1998)	(1998)	(1998)	(1973)	(1997)	(1979)	(1997)	(1997)	(1984)	(1993)	(1996)	(1997)
MIN	25,580	17,000	9,953	10,800	13,220	15,380	21,820	33,790	33,710	29,650	29,320	32,270
(WY)	(1962)	(1962)	(1956)	(1957)	(1957)	(1957)	(1957)	(1956)	(1956)	(2002)	(2003)	(2003)

06813500 MISSOURI RIVER AT RULO, NE—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1953 - 2003a	
ANNUAL TOTAL	11,295,000		11,660,100			
ANNUAL MEAN	30,950		31,950		42,040	
HIGHEST ANNUAL MEAN					71,880	1997
LOWEST ANNUAL MEAN					26,340	1957
HIGHEST DAILY MEAN	51,500	Aug 24	62,800	Jun 13	289,000	Jul 24, 1993
LOWEST DAILY MEAN	18,500	Dec 28	16,000	Jan 19b	4,420	Jan 13, 1957
ANNUAL SEVEN-DAY MINIMUM	19,100	Dec 24	16,900	Jan 15	5,560	Nov 30, 1955
MAXIMUM PEAK FLOW			77,700	Jun 13	307,000	Jul 24, 1993
MAXIMUM PEAK STAGE			16.57	Jun 13	25.37	Jul 24, 1993
INSTANTANEOUS LOW FLOW			15,800	Jan 20		
ANNUAL RUNOFF (AC-FT)	22,400,000		23,130,000		30,460,000	
ANNUAL RUNOFF (CFSM)	0.075		0.077		0.10	
ANNUAL RUNOFF (INCHES)	1.01		1.05		1.38	
10 PERCENT EXCEEDS	37,100		44,400		66,500	
50 PERCENT EXCEEDS	33,100		32,800		38,500	
90 PERCENT EXCEEDS	21,400		19,900		19,000	

a Post regulation.
b Also Jan. 20.
e Estimated.



06817000 NODAWAY RIVER AT CLARINDA, IA

LOCATION.--Lat 40°44'19", long 95°00'47", in SW¼ NE¼ sec.32, T.69 N., R.36 W., Page County, Hydrologic Unit 10240009, near left abutment on downstream side of bridge on State Highway 2 (city route), 0.5 mi downstream from North Branch, 1.2 mi east of city square of Clarinda, and 7.5 mi upstream from East Nodaway River.

DRAINAGE AREA.--762 mi^2.

PERIOD OF RECORD.--May 1918 to July 1925, May 1936 to current year. Monthly discharge only for some periods, published in WSP 1310. No winter records 1918-1925.

REVISED RECORDS.--WSP 1240: 1918-20 (M), 1921, 1922-25 (M), 1936-38, 1942, 1943-45 (M), 1948. WSP 1440: Drainage area. WSP 1710: 1958, 1959 (P).

GAGE.--Water-stage recorder. Datum of gage is 955.36 ft above NGVD of 1929. Prior to July 5, 1925, and May 28, 1936 to Mar. 26, 1957, nonrecording gage at same site, and prior to Oct. 1, 1987, at datum 5.00 ft. higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Clarinda municipal water supply is taken from Nodaway River, 500 ft upstream from station. Average daily pumpage was 1.61 ft^3/s. U.S. Geological Survey and satellite data collection platform at station.

COOPERATION.--Average pumpage provided by City of Clarinda water works.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1903 reached a stage of 25.4 ft, from floodmarks, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	39	34	e36	e41	e78	43	1,070	205	131	50	25
2	88	36	36	e31	e41	e58	42	659	189	126	54	24
3	142	35	30	e25	e36	e71	42	435	206	124	47	23
4	334	33	33	e35	e28	e38	36	533	207	117	42	22
5	228	35	e28	e33	e25	e33	38	3,130	193	112	41	23
6	168	36	e34	e27	e16	e43	38	1,420	194	193	40	22
7	87	37	42	e23	e10	e52	54	1,060	171	175	40	22
8	61	38	42	e38	e15	e47	59	1,450	174	155	39	20
9	53	37	38	e23	e13	e37	59	5,480	169	113	36	20
10	46	36	34	e13	e12	e44	64	2,420	207	413	35	22
11	42	30	40	e13	e18	e59	65	1,410	602	276	38	27
12	37	28	e35	e18	e20	92	79	1,060	403	154	39	34
13	33	30	e31	e24	e23	235	82	903	296	122	45	33
14	30	31	e32	e31	e29	186	67	869	248	111	37	32
15	27	31	e33	e30	e43	198	58	1,090	206	102	34	25
16	27	30	e35	e26	e74	332	63	857	194	92	34	22
17	35	30	36	e23	e88	222	53	734	363	90	32	20
18	38	29	38	e35	e95	149	54	659	212	86	29	21
19	32	30	40	e45	e88	115	67	605	339	78	28	25
20	30	33	35	e37	e148	117	114	576	308	78	28	23
21	28	31	25	e31	e353	103	113	528	195	71	27	24
22	24	32	e26	e25	e278	87	107	494	172	64	25	24
23	25	32	e18	e16	e121	73	86	471	170	63	24	24
24	32	29	e22	e28	e69	62	89	434	161	59	24	23
25	54	20	e24	e31	e52	56	89	418	168	59	23	22
26	63	e19	e28	e18	e60	48	83	379	349	60	21	21
27	44	e17	e30	e23	e63	50	80	324	323	55	20	20
28	43	30	e36	e29	e72	49	69	295	199	70	22	19
29	37	43	e36	e27	---	46	76	283	164	51	23	18
30	43	35	e34	e32	---	46	129	282	143	50	23	17
31	46	---	e30	e35	---	45	---	234	---	48	26	---
TOTAL	2,017	952	1,015	861	1,931	2,871	2,098	30,562	7,130	3,498	1,026	697
MEAN	65.1	31.7	32.7	27.8	69.0	92.6	69.9	986	238	113	33.1	23.2
MAX	334	43	42	45	353	332	129	5,480	602	413	54	34
MIN	24	17	18	13	10	33	36	234	143	48	20	17
AC-FT	4,000	1,890	2,010	1,710	3,830	5,690	4,160	60,620	14,140	6,940	2,040	1,380
CFSM	0.09	0.04	0.04	0.04	0.09	0.12	0.09	1.29	0.31	0.15	0.04	0.03
IN.	0.10	0.05	0.05	0.04	0.09	0.14	0.10	1.49	0.35	0.17	0.05	0.03

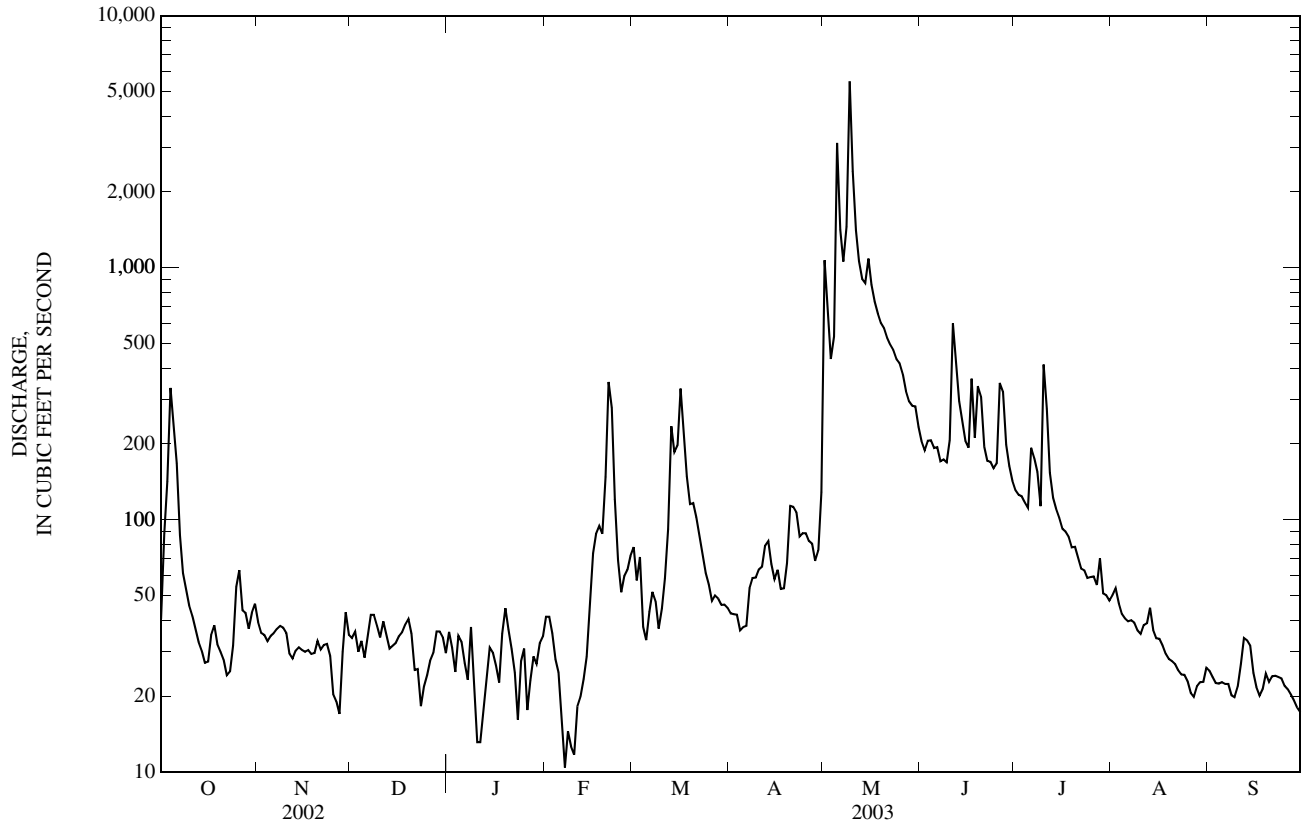
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 2003, BY WATER YEAR (WY)

MEAN	170	170	134	127	309	565	558	706	759	430	227	307
MAX	1,658	1,602	1,090	853	1,857	2,456	2,450	2,489	4,779	6,778	1,953	3,019
(WY)	(1974)	(1973)	(1993)	(1974)	(1973)	(1979)	(1973)	(1996)	(1947)	(1993)	(1987)	(1972)
MIN	7.52	8.27	2.10	6.00	11.3	14.0	14.4	10.3	20.0	17.3	9.81	6.83
(WY)	(1938)	(1938)	(1924)	(1924)	(1940)	(1938)	(1956)	(1939)	(1968)	(1954)	(1936)	(1937)

06817000 NODAWAY RIVER AT CLARINDA, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1919 - 2003	
ANNUAL TOTAL	36,007		54,658			
ANNUAL MEAN	98.6		150		377	
HIGHEST ANNUAL MEAN					1,577	1993
LOWEST ANNUAL MEAN					36.8	1968
HIGHEST DAILY MEAN	2,650	May 12	5,480	May 9	25,500	Sep 13, 1972
LOWEST DAILY MEAN	17	Nov 27	10	Feb 7a	1.0	Dec 9, 1923b
ANNUAL SEVEN-DAY MINIMUM	25	Dec 21	15	Feb 6	1.3	Dec 25, 1923
MAXIMUM PEAK FLOW			8,390	May 9	31,100	Jun 13, 1947c
MAXIMUM PEAK STAGE			13.78	May 9	25.30	Jun 13, 1947d
ANNUAL RUNOFF (AC-FT)	71,420		108,400		273,200	
ANNUAL RUNOFF (CFSM)	0.13		0.20		0.49	
ANNUAL RUNOFF (INCHES)	1.76		2.67		6.73	
10 PERCENT EXCEEDS	205		323		829	
50 PERCENT EXCEEDS	49		42		100	
90 PERCENT EXCEEDS	28		23		20	

a Ice affected.
b Also Dec. 27-31, 1923.
c From rating curve extended above 15,000 ft^3/s on basis of an overflow profile and extended channel rating.
d From floodmark.
e Estimated.



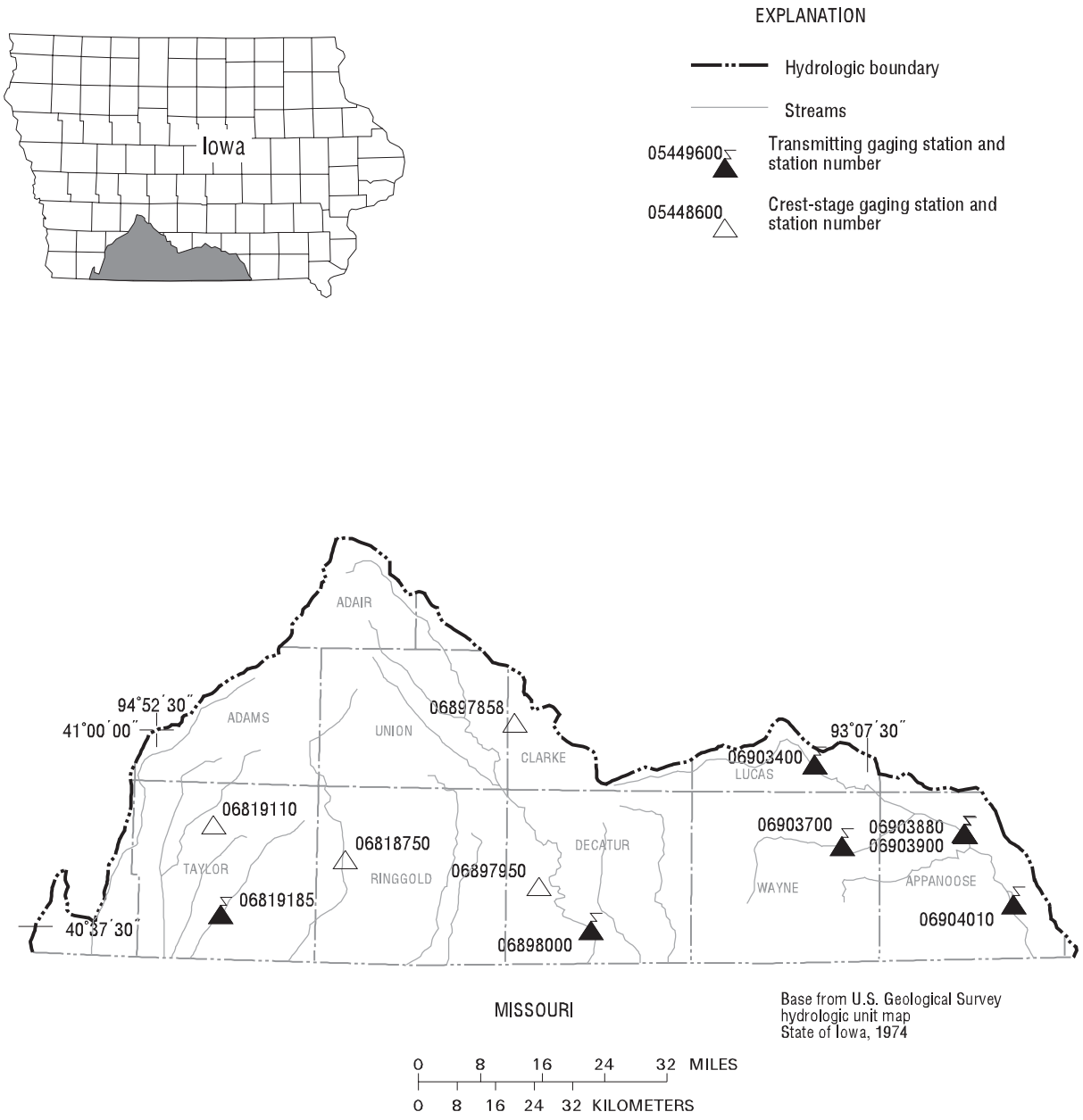


Figure 20. Locations of active continuous-record and crest-stage gaging stations in the Platte River, Grand River, and Chariton River drainage basins.

Gaging Stations

06819185 East Fork 102 River at Bedford, IA 442
06898000 Thompson River at Davis City, IA. 444
06903400 Chariton River near Chariton, IA 446
06903700 South Fork Chariton River near Promise City, IA 448
06903880 Rathbun Lake near Rathbun, IA. 450
06903900 Chariton River near Rathbun, IA 452
06904010 Chariton River near Moulton, IA 454

Crest Stage Gaging Stations

06818750 Platte River near Diagonal, IA 466
06819110 Middle Branch 102 River near Gravity, IA 466
06897858 Sevenmile Creek near Thayer, IA 466
06897950 Elk Creek near Decatur City, IA 466

06819185 EAST FORK ONE HUNDRED AND TWO RIVER AT BEDFORD, IA

LOCATION.--Lat 40°39'38", long 94°42'59", in NE$^1/_4$ sec.35, T.68 N., R.34 W., Taylor County, Hydrologic Unit 10240013, on left bank at downstream side of bridge of County Highway N44, 0.1 mi south of Bedford, 0.4 mi upstream from concrete stablization dam, and 3.0 mi upstream from Daugherty Creek.

DRAINAGE AREA.--85.4 mi^2.

PERIOD OF RECORD.--October 1983 to current year. September 1959 to September 1983, at site 2 mi downstream published as "near Bedford" (station 06819190) not equivalent because of difference in drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,069.16 ft above NGVD of 1929.

REMARKS.--Records are fair, except those for estimated daily discharges, which are poor. Slight regulation at low flow by low dam used for water supply in Bedford. U.S. Geolocial Survey satellite data collection platform and a U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.57	0.34	0.30	0.30	0.14	1.2	23	12	1.4	0.59	0.50	0.19
2	0.99	0.33	0.29	0.29	0.14	1.2	23	5.9	3.9	0.58	0.43	0.09
3	1.8	0.45	0.28	0.27	0.25	1.2	23	3.2	5.8	0.54	0.55	0.06
4	4.7	0.44	0.28	0.26	0.19	1.2	25	91	3.7	0.28	0.59	0.02
5	0.21	0.46	e0.28	0.28	0.14	1.2	23	83	3.1	0.28	0.64	0.01
6	0.17	0.25	0.28	0.32	0.14	1.1	24	36	12	0.48	0.52	0.02
7	0.02	0.20	0.28	0.31	0.13	1.1	26	27	10	0.58	0.44	0.04
8	0.03	0.21	0.28	0.33	0.13	1.2	25	45	7.9	0.50	0.51	0.07
9	0.09	0.29	0.28	0.35	0.12	1.1	27	146	7.5	0.44	0.36	0.11
10	0.07	0.23	0.27	0.36	0.13	1.1	29	87	10	0.33	1.2	0.14
11	0.06	0.20	0.29	0.29	0.13	1.1	30	44	11	0.13	3.4	1.9
12	0.05	0.20	0.32	0.23	0.12	1.1	29	28	7.3	0.33	0.54	0.18
13	0.05	0.20	0.33	0.22	0.11	1.1	27	22	6.9	0.06	0.34	0.18
14	0.05	0.22	0.33	0.22	0.11	1.2	26	25	2.3	0.43	0.26	0.19
15	0.06	0.22	0.33	0.20	0.11	3.4	26	40	1.1	0.36	0.27	0.15
16	0.10	0.22	0.34	e0.18	0.10	e2.5	29	25	1.7	0.27	0.29	0.15
17	0.16	0.22	0.36	e0.17	0.32	e3.0	26	18	1.0	0.33	0.28	0.12
18	0.14	0.23	0.35	e0.17	0.14	e3.4	27	14	1.00	0.37	0.28	0.27
19	0.12	0.23	0.36	e0.18	11	e14	32	14	0.98	0.37	0.34	0.13
20	0.10	0.25	0.36	0.18	21	e27	59	16	1.1	0.39	0.33	0.11
21	0.10	0.25	0.35	0.17	24	e37	45	12	1.0	0.38	0.14	0.37
22	0.10	0.25	0.35	e0.17	15	e29	33	9.9	3.5	0.34	0.04	0.27
23	0.12	0.26	0.32	e0.13	2.8	e24	26	9.0	6.1	0.25	0.02	0.19
24	0.65	0.28	0.31	e0.14	1.3	e22	25	9.2	6.2	0.22	0.03	0.18
25	1.4	0.28	e0.29	e0.16	1.2	24	32	9.8	8.8	0.20	0.07	0.15
26	0.38	0.32	e0.28	e0.15	1.2	23	25	8.3	9.3	0.17	0.03	0.14
27	0.27	0.32	0.27	0.16	1.2	24	17	7.1	2.1	0.19	0.02	0.13
28	0.18	0.30	0.26	0.16	1.2	23	13	5.6	0.92	1.6	0.02	0.10
29	0.18	0.30	0.27	0.16	---	23	10	6.1	0.74	0.41	0.04	0.07
30	0.69	0.33	0.30	0.15	---	23	14	4.4	0.65	0.35	0.04	0.05
31	0.48	---	0.32	0.15	---	23	---	2.7	---	0.45	0.23	---
TOTAL	14.09	8.28	9.51	6.81	82.55	344.4	799	866.2	138.99	12.20	12.75	5.78
MEAN	0.45	0.28	0.31	0.22	2.95	11.1	26.6	27.9	4.63	0.39	0.41	0.19
MAX	4.7	0.46	0.36	0.36	24	37	59	146	12	1.6	3.4	1.9
MIN	0.02	0.20	0.26	0.13	0.10	1.1	10	2.7	0.65	0.06	0.02	0.01
AC-FT	28	16	19	14	164	683	1,580	1,720	276	24	25	11
CFSM	0.01	0.00	0.00	0.00	0.03	0.13	0.31	0.33	0.05	0.00	0.00	0.00
IN.	0.01	0.00	0.00	0.00	0.04	0.15	0.35	0.38	0.06	0.01	0.01	0.00

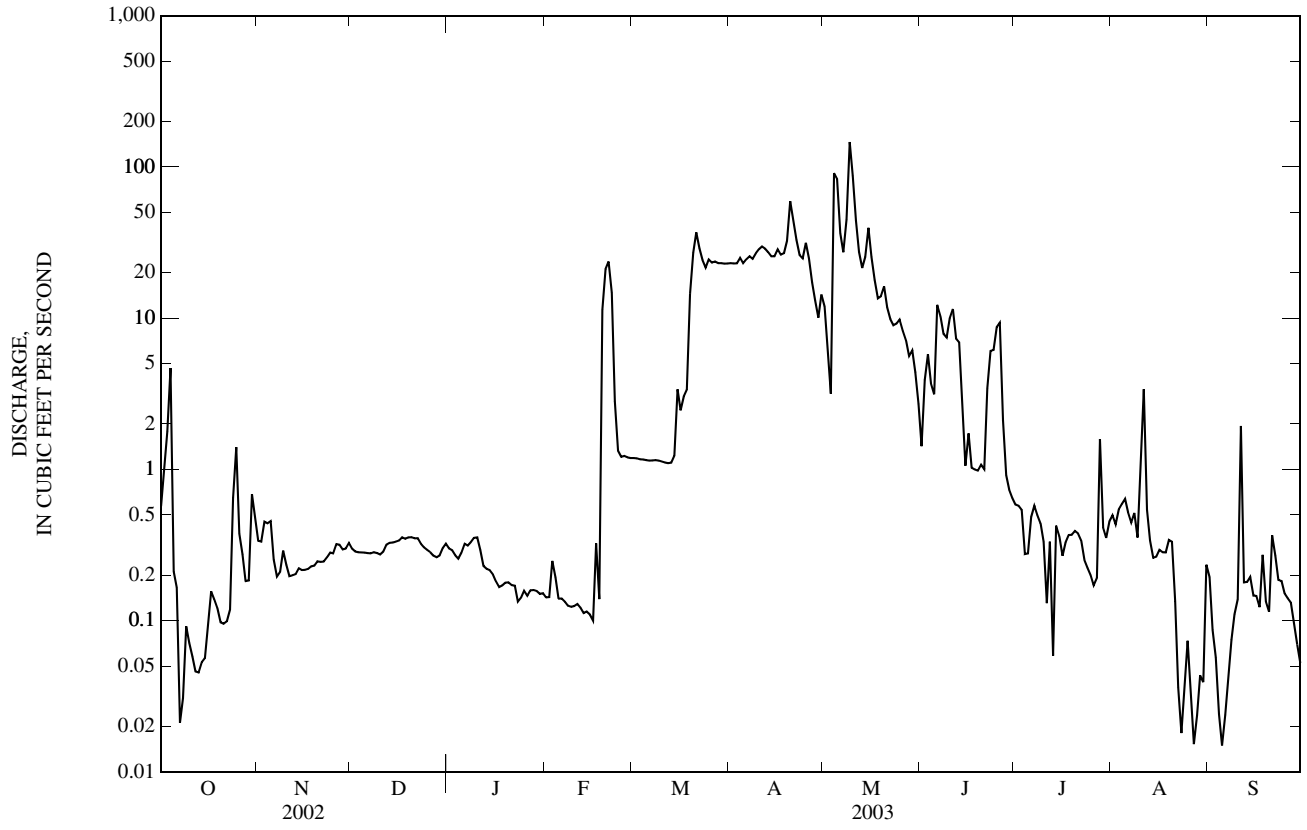
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2003, BY WATER YEAR (WY)

MEAN	21.2	26.5	24.5	10.0	40.6	73.7	93.1	139	102	103	20.1	44.3
MAX	159	202	181	50.2	149	276	289	488	255	889	173	260
(WY)	(1987)	(1993)	(1993)	(1998)	(1997)	(1998)	(1984)	(1995)	(1995)	(1993)	(1987)	(1993)
MIN	0.26	0.28	0.31	0.22	0.17	2.13	0.82	0.67	1.90	0.39	0.41	0.19
(WY)	(1992)	(2003)	(2003)	(2003)	(1989)	(1989)	(1989)	(1989)	(1988)	(2003)	(2003)	(2003)

06819185 EAST FORK ONE HUNDRED AND TWO RIVER AT BEDFORD, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1984 - 2003	
ANNUAL TOTAL	2,698.19		2,300.56			
ANNUAL MEAN	7.39		6.30		58.2	
HIGHEST ANNUAL MEAN					200	1993
LOWEST ANNUAL MEAN					6.30	2003
HIGHEST DAILY MEAN	672	May 11	146	May 9	7,600	Jul 5, 1993
LOWEST DAILY MEAN	0.00	Sep 17	0.01	Sep 5	0.00	Jul 6, 1989a
ANNUAL SEVEN-DAY MINIMUM	0.00	Sep 20	0.03	Aug 22	0.00	Aug 3, 1989b
MAXIMUM PEAK FLOW			282	May 4	9,570	Jul 14, 1986
MAXIMUM PEAK STAGE			13.75	May 4	23.85	Jul 5, 1993
INSTANTANEOUS LOW FLOW			0.00	Jul 13c		
ANNUAL RUNOFF (AC-FT)	5,350		4,560		42,140	
ANNUAL RUNOFF (CFSM)	0.087		0.074		0.68	
ANNUAL RUNOFF (INCHES)	1.18		1.00		9.25	
10 PERCENT EXCEEDS	13		24		93	
50 PERCENT EXCEEDS	0.85		0.35		6.7	
90 PERCENT EXCEEDS	0.15		0.11		0.56	

a Many days between July 6 to Dec. 24, 1989.
b Also Sept. 20, 2002.
c Also Aug. 26-30.
e Estimated.



06898000 THOMPSON RIVER AT DAVIS CITY, IA

LOCATION.--Lat 40°38'25", long 93°48'29", in SE¼ SE¼ sec.35, T.68 N., R.26 W., Decatur County, Hydrologic Unit 10280102, on left bank 15 ft downstream from bridge on U.S. Highway 69 at Davis City, 3.1 mi. upstream from Dickersons Branch, and 5.8 mi. upstream from Iowa-Missouri State line. On Aug. 13, gage moved 15 ft downstream of bridge on left bank.

DRAINAGE AREA.--701 mi^2.

PERIOD OF RECORD.--May 1918 to July 1925, July 1941 to current year. Monthly discharge only for some periods, published in WSP 1310. No winter records 1921-25. Prior to October 1918, published as "Grand River".

REVISED RECORDS.--WSP 1240: 1918, 1920-21 (M), 1922-24, 1925 (M), 1946-47 (M). WSP 1440: Drainage area. WSP 1710: 1957.

GAGE.--Water-stage recorder. Datum of gage is 874.04 ft above NGVD of 1929. May 14, 1918 to July 2, 1925, July 14, 1941 to Feb. 24, 1942, nonrecording gage, and Feb. 25, 1942 to Feb. 8, 1967, water-stage recorder at same site at datum 2.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite data collection platform and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 8, 1885, reached a stage of 22.8 ft, datum in use prior to Feb. 9, 1967, from floodmark, discharge, 30,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	13	6.0	5.6	4.9	e14	33	166	70	113	14	2.9
2	2.5	11	6.5	5.0	5.0	e13	32	246	69	92	14	2.9
3	3.1	9.6	6.1	4.8	5.1	e12	30	328	68	78	12	2.7
4	8.2	8.9	6.2	5.5	5.8	e15	29	237	65	69	11	2.2
5	26	8.3	6.2	5.8	4.8	e16	28	990	69	61	11	2.1
6	33	8.6	5.8	6.1	4.7	e20	28	1,760	225	58	10	2.0
7	e15	9.2	6.0	5.8	4.2	e20	31	889	144	432	9.2	2.1
8	e11	9.6	5.9	5.8	4.2	e15	35	671	109	152	8.4	4.4
9	e8.3	9.1	5.2	6.2	4.1	e20	39	1,850	92	91	7.9	1.9
10	e7.4	7.8	5.5	5.0	4.1	16	41	1,560	829	87	7.3	1.4
11	e6.6	7.6	6.1	5.0	4.1	17	38	1,160	897	116	7.0	2.6
12	e5.1	8.4	6.8	5.2	4.0	20	41	597	439	86	6.8	3.8
13	e3.8	8.9	7.5	5.2	3.9	24	46	402	266	68	5.8	3.8
14	e3.5	8.0	6.3	4.4	4.6	27	53	330	173	54	6.7	7.6
15	e3.7	7.0	5.9	4.0	3.4	39	48	307	128	44	6.7	5.4
16	3.3	7.1	6.5	3.8	5.5	159	44	311	101	38	6.3	4.6
17	3.5	7.0	8.0	3.8	5.4	204	39	278	85	35	5.5	4.9
18	3.2	7.3	8.9	3.7	4.6	179	37	224	76	32	4.9	4.3
19	3.1	7.4	9.1	3.7	5.0	122	43	195	70	28	4.3	4.8
20	3.1	6.9	8.6	3.8	6.7	100	64	179	64	27	5.7	4.2
21	3.1	6.8	8.1	3.6	e100	82	125	163	71	25	3.9	5.7
22	3.2	7.0	6.6	3.4	e257	73	159	146	81	24	3.1	6.4
23	3.3	6.9	5.9	e3.0	e134	68	117	126	65	22	2.5	6.1
24	5.4	6.8	6.4	e2.5	e66	59	90	115	59	21	2.2	6.5
25	7.0	6.9	5.9	e4.0	e51	49	103	112	58	19	2.1	4.9
26	8.0	7.0	5.6	e4.5	e35	42	156	105	375	19	2.1	4.2
27	8.7	7.3	5.9	e4.4	e17	39	124	97	1,210	17	2.2	3.6
28	10	6.5	5.6	4.6	e17	37	96	90	400	22	1.8	3.1
29	12	6.8	6.4	4.3	---	35	77	82	227	21	2.1	2.6
30	14	6.1	6.8	4.1	---	33	100	79	152	21	1.9	2.3
31	21	---	6.6	4.7	---	32	---	74	---	15	2.6	---
TOTAL	251.3	238.8	202.9	141.3	771.1	1,601	1,926	13,869	6,737	1,987	191.0	116.0
MEAN	8.11	7.96	6.55	4.56	27.5	51.6	64.2	447	225	64.1	6.16	3.87
MAX	33	13	9.1	6.2	257	204	159	1,850	1,210	432	14	7.6
MIN	2.2	6.1	5.2	2.5	3.4	12	28	74	58	15	1.8	1.4
AC-FT	498	474	402	280	1,530	3,180	3,820	27,510	13,360	3,940	379	230
CFSM	0.01	0.01	0.01	0.01	0.04	0.07	0.09	0.64	0.32	0.09	0.01	0.01
IN.	0.01	0.01	0.01	0.01	0.04	0.08	0.10	0.74	0.36	0.11	0.01	0.01

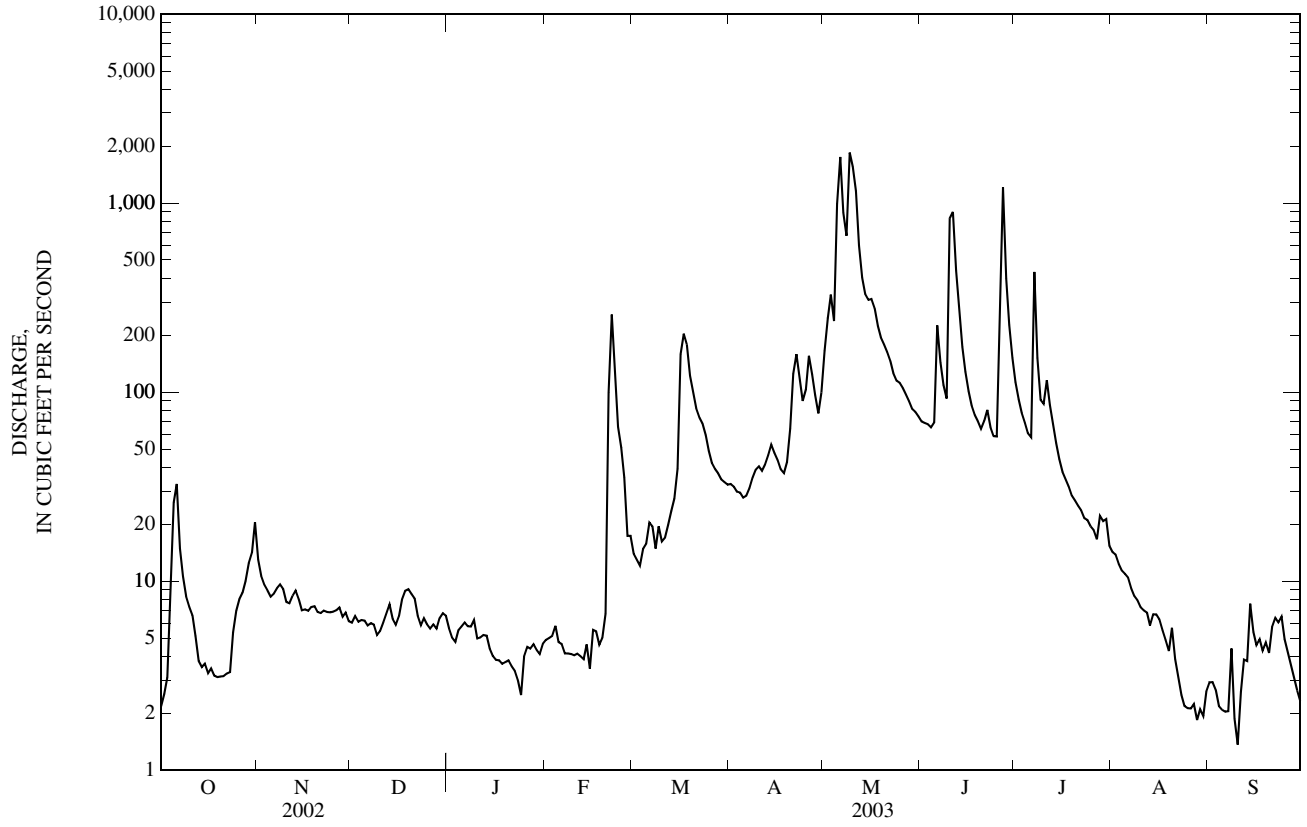
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 2003, BY WATER YEAR (WY)

MEAN	182	209	145	150	330	640	684	698	647	414	179	323
MAX	2,138	1,462	1,299	1,292	1,849	2,375	2,586	3,364	4,750	7,239	2,255	5,178
(WY)	(1974)	(1962)	(1983)	(1960)	(1973)	(1979)	(1973)	(1996)	(1947)	(1993)	(1987)	(1992)
MIN	1.41	2.07	0.94	0.62	1.14	10.7	2.55	1.19	3.08	1.98	6.16	3.87
(WY)	(1957)	(1956)	(1956)	(1956)	(1956)	(1954)	(1956)	(1956)	(1956)	(1977)	(2003)	(2003)

06898000 THOMPSON RIVER AT DAVIS CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1919 - 2003	
ANNUAL TOTAL	24,875.3		28,032.4			
ANNUAL MEAN	68.2		76.8		386	
HIGHEST ANNUAL MEAN					1,469	1993
LOWEST ANNUAL MEAN					28.6	2000
HIGHEST DAILY MEAN	3,480	May 11	1,850	May 9	52,900	Sep 16, 1992
LOWEST DAILY MEAN	1.9	Sep 30	1.4	Sep 10	0.10	Jun 25, 1956
ANNUAL SEVEN-DAY MINIMUM	2.7	Sep 27	2.1	Aug 24	0.36	Jun 19, 1956
MAXIMUM PEAK FLOW			2,260	May 9	57,000	Sep 16, 1992
MAXIMUM PEAK STAGE			4.24	May 9	24.29	Sep 16, 1992
INSTANTANEOUS LOW FLOW			1.0	Sep 10a		
ANNUAL RUNOFF (AC-FT)	49,340		55,600		279,500	
ANNUAL RUNOFF (CFSM)	0.097		0.11		0.55	
ANNUAL RUNOFF (INCHES)	1.32		1.49		7.48	
10 PERCENT EXCEEDS	127		159		834	
50 PERCENT EXCEEDS	21		9.1		80	
90 PERCENT EXCEEDS	4.7		3.4		9.0	

a Also Sept. 11.
e Estimated.



06903400 CHARITON RIVER NEAR CHARITON, IA

LOCATION.--Lat 40°57'12", long 93°15'37", in SW¼ NE¼ sec.15, T.71 N., R.21 W., Lucas County, Hydrologic Unit 10280201, on right bank 15 ft downstream from bridge on County Highway S43, 0.1 mi downstream from Wolf Creek, and 5.0 mi southeast of Chariton.

DRAINAGE AREA.--182 mi^2.

PERIOD OF RECORD.--October 1965 to current year. Occasional low-flow measurements, water years 1958-60, 1962, 1964.

GAGE.--Water stage recorder. Datum of gage is 917.90 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good, except estimated daily discharges, which are poor. Beaver activity in September. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1960 reached a stage of about 23 ft, discharge, about 15,000 ft^3/s and flood of June 5, 1947 reached a stage of 21.65 ft, from floodmark, discharge, 11,000 ft^3/s. A discharge of 0.08 ft^3/s was measured on Oct. 30, 1963.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e0.49	e0.18	e0.01	e0.03	e0.02	e1.6	4.3	47	e2.0	4.1	e0.13	0.05
2	e1.1	e0.22	e0.06	e0.04	e0.03	e1.1	4.0	27	e2.4	3.1	e0.12	0.02
3	e1.6	e0.26	e0.03	e0.01	e0.02	e1.1	3.9	12	e2.7	2.5	e0.11	0.01
4	e1.2	e0.24	e0.02	e0.01	e0.01	e0.98	4.5	247	e2.6	2.0	e0.09	0.00
5	e0.85	e0.24	e0.04	e0.02	e0.00	e0.66	5.6	574	e2.5	1.8	e0.09	0.00
6	e0.85	e0.22	e0.02	e0.03	e0.00	e0.54	5.9	219	6.0	42	e0.08	0.00
7	e0.66	e0.21	e0.04	e0.03	e0.00	e0.64	6.9	97	31	119	e0.05	0.00
8	e0.79	e0.21	e0.04	e0.05	e0.00	e0.58	8.1	53	36	36	e0.05	0.00
9	e0.44	e0.20	e0.01	e0.04	e0.00	e0.37	6.4	454	30	14	e0.04	0.00
10	e0.29	e0.19	e0.04	e0.04	e0.00	e0.39	5.7	191	80	9.4	e0.03	0.00
11	e0.17	e0.19	e0.10	e0.02	e0.00	e0.62	5.0	107	69	6.5	0.06	0.04
12	e0.12	e0.19	e0.12	e0.01	e0.00	e3.7	4.7	43	49	3.8	0.04	0.17
13	e0.11	e0.18	e0.12	e0.02	e0.00	e15	4.3	27	32	2.4	0.04	1.5
14	e0.11	e0.17	e0.12	e0.02	e0.00	e27	4.0	20	15	1.6	0.02	25
15	e0.10	e0.15	e0.12	e0.01	e0.01	e34	3.7	17	25	1.1	0.01	14
16	e0.08	e0.14	e0.14	e0.00	e0.00	e27	3.5	13	11	0.73	0.00	5.1
17	e0.08	e0.12	e0.14	e0.01	e0.00	e16	3.5	10	5.1	0.59	0.00	2.6
18	e0.08	e0.12	e0.14	e0.01	e0.36	e14	3.5	8.4	6.1	0.55	0.01	1.2
19	e0.08	e0.11	e0.12	e0.00	e1.1	14	4.4	7.4	11	0.44	0.00	0.85
20	e0.07	e0.09	e0.10	e0.00	e5.9	13	11	7.1	6.1	0.41	0.03	0.57
21	e0.07	e0.09	e0.10	e0.01	e8.4	10	12	5.9	3.6	0.41	0.06	0.87
22	e0.05	e0.08	e0.09	e0.00	e8.2	8.5	9.4	5.5	2.2	0.34	0.04	1.4
23	e0.04	e0.07	e0.09	e0.00	e7.2	7.3	9.4	4.6	1.8	0.30	0.02	3.1
24	e0.10	e0.07	e0.08	e0.00	e5.3	6.4	13	4.0	1.3	0.29	0.01	1.8
25	e0.20	e0.05	e0.07	e0.00	e3.5	6.0	22	4.0	19	0.26	0.01	0.99
26	e0.28	e0.05	e0.03	e0.00	e1.5	5.3	22	3.5	301	0.22	0.00	0.80
27	e0.14	e0.04	e0.03	e0.00	e1.7	5.0	17	e2.8	45	0.21	0.00	0.57
28	e0.16	e0.04	e0.05	e0.00	e2.0	5.2	17	e2.6	15	0.29	0.00	0.43
29	e0.18	e0.05	e0.07	e0.00	---	4.7	11	e2.5	8.4	0.26	0.01	0.38
30	e0.19	e0.04	e0.12	e0.01	---	4.5	16	e2.3	5.6	0.19	0.00	0.39
31	e0.19	---	e0.01	e0.02	---	4.3	---	e2.1	---	e0.14	0.04	---
TOTAL	10.87	4.21	2.27	0.44	45.25	239.48	251.7	2,220.7	827.4	254.93	1.19	61.84
MEAN	0.35	0.14	0.073	0.014	1.62	7.73	8.39	71.6	27.6	8.22	0.038	2.06
MAX	1.6	0.26	0.14	0.05	8.4	34	22	574	301	119	0.13	25
MIN	0.04	0.04	0.01	0.00	0.00	0.37	3.5	2.1	1.3	0.14	0.00	0.00
CFSM	0.00	0.00	0.00	0.00	0.01	0.04	0.05	0.39	0.15	0.05	0.00	0.01
IN.	0.00	0.00	0.00	0.00	0.01	0.05	0.05	0.45	0.17	0.05	0.00	0.01

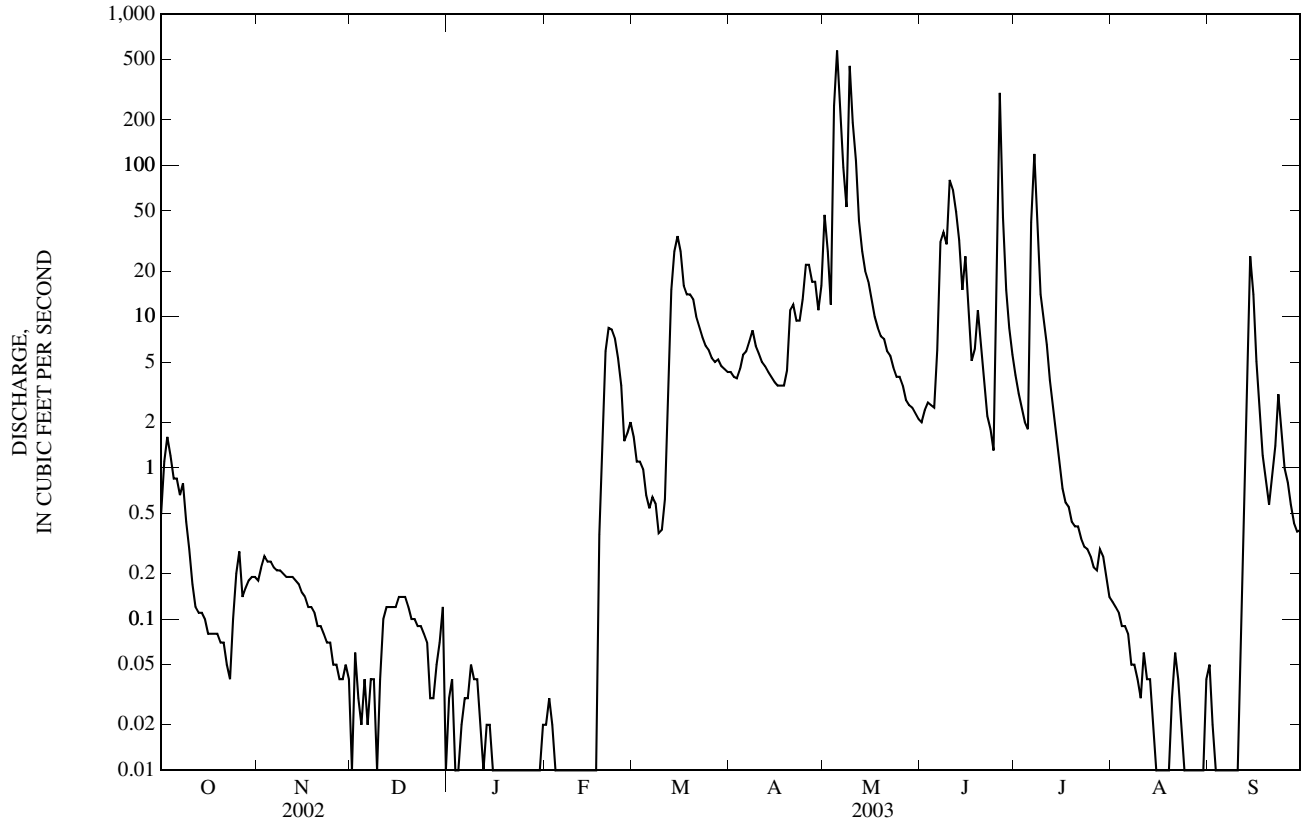
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2003, BY WATER YEAR (WY)

MEAN	76.2	55.3	56.8	33.8	82.8	177	235	233	163	152	64.9	117
MAX	568	294	408	340	403	761	1,093	1,097	856	1,711	618	1,704
(WY)	(1974)	(1993)	(1983)	(1974)	(1997)	(1979)	(1991)	(1995)	(1967)	(1993)	(1987)	(1992)
MIN	0.005	0.003	0.000	0.014	0.22	1.22	0.068	2.12	0.38	0.000	0.038	0.086
(WY)	(1990)	(1990)	(1990)	(2003)	(1989)	(2000)	(1989)	(2000)	(1988)	(1988)	(2003)	(1991)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1966 - 2003	
ANNUAL TOTAL	14,530.46		3,920.28			
ANNUAL MEAN	39.8		10.7		121	
HIGHEST ANNUAL MEAN					345	1993
LOWEST ANNUAL MEAN					9.71	1989
HIGHEST DAILY MEAN	2,360	May 12	574	May 5	24,600	Sep 15, 1992
LOWEST DAILY MEAN	0.01	Dec 1	0.00	Jan 16a	0.00	Aug 1, 1977b
ANNUAL SEVEN-DAY MINIMUM	0.03	Dec 3	0.00	Jan 22	0.00	Jun 21, 1988
MAXIMUM PEAK FLOW			748	May 5	37,700	Sep 15, 1992
MAXIMUM PEAK STAGE			12.61	May 5	29.32	Sep 15, 1992
ANNUAL RUNOFF (CFSM)	0.22		0.059		0.66	
ANNUAL RUNOFF (INCHES)	2.97		0.80		9.00	
10 PERCENT EXCEEDS	65		16		259	
50 PERCENT EXCEEDS	1.3		0.30		12	
90 PERCENT EXCEEDS	0.09		0.00		0.50	

06903400 CHARITON RIVER NEAR CHARITON, IA—Continued

a Many days in Jan., Feb., Aug., and Sept.
b Many days in 1977, 1978, 1988-92, 2003.
e Estimated.



06903700 SOUTH FORK CHARITON RIVER NEAR PROMISE CITY, IA

LOCATION.--Lat 40°48'02", long 93°11'32", in SW$^1/_4$ SW$^1/_4$ sec.5, T.69 N., R.20 W., Wayne County, Hydrologic Unit 10280201, on right bank 20 ft downstream from bridge on County Highway S50, 1.3 mi downstream from Jordan Creek, and 4.3 mi northwest of Promise City.

DRAINAGE AREA.--168 mi^2.

PERIOD OF RECORD.--October 1967 to current year. Occasional low-flow measurements, water years 1958-66, published as "near Bethlehem". Monthly discharge measurements for March 1965 to September 1967 available in files of Iowa City District Office.

GAGE.--Water-stage recorder. Datum of gage is 913.70 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 21, 1965, reached a stage of 25.5 ft, from floodmarks, discharge, about 18,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	0.94	0.51	0.89	e0.77	e0.96	1.6	62	1.8	5.0	1.1	1.2
2	1.7	1.3	0.70	0.96	e0.83	e0.73	1.4	56	2.1	3.5	0.92	1.3
3	2.1	1.6	0.49	0.71	e0.69	e0.71	1.3	22	3.1	3.5	0.69	1.8
4	1.8	1.4	0.46	0.70	e0.57	e0.93	1.7	218	3.0	2.8	0.53	1.3
5	1.2	1.4	0.47	0.77	e0.51	e0.97	1.5	443	2.6	2.4	0.54	0.98
6	1.3	1.3	0.40	0.83	e0.32	e0.89	2.0	97	4.6	2.1	1.0	0.77
7	1.0	1.3	0.47	0.88	e0.05	e0.81	4.0	47	33	2.0	0.75	0.55
8	1.2	1.00	0.47	1.1	e0.15	e0.81	7.8	40	13	3.3	0.91	0.50
9	0.80	0.98	0.34	1.1	e0.04	e0.81	5.9	368	5.3	85	0.65	0.42
10	0.62	0.92	0.41	1.1	e0.04	e0.85	5.3	95	19	56	0.45	0.37
11	0.44	0.85	0.56	0.89	e0.07	e1.3	3.6	71	44	35	0.49	2.2
12	0.37	0.73	0.69	0.74	e0.06	e6.6	2.9	35	14	12	0.47	2.6
13	0.31	0.71	0.67	0.78	e0.41	e18	2.3	21	6.4	4.1	0.56	12
14	0.31	0.72	0.66	0.81	e0.53	e11	2.0	17	6.1	2.2	0.82	27
15	0.26	0.71	0.76	0.57	e0.49	e7.7	1.6	16	4.8	1.4	0.57	17
16	0.22	0.70	0.78	0.57	e0.61	e3.1	1.6	12	7.3	1.0	0.38	5.5
17	0.31	0.65	0.90	0.67	e0.73	e1.6	1.6	9.2	3.0	1.00	0.28	2.3
18	0.34	0.64	0.84	0.66	e1.1	e1.5	1.6	7.1	2.0	0.89	0.23	1.5
19	0.29	0.58	0.88	0.54	e2.5	e1.7	2.5	6.7	1.8	0.75	0.18	1.4
20	0.28	0.56	0.76	0.57	e7.2	e1.8	17	7.8	1.4	0.85	0.20	1.3
21	0.29	0.54	0.70	0.64	e10	e2.1	34	9.2	1.2	0.72	0.20	2.2
22	0.29	0.51	0.72	0.50	e10	e2.4	18	6.0	1.0	0.63	0.21	4.3
23	0.33	0.59	0.69	e0.21	e8.6	e2.4	7.8	4.7	1.2	0.78	0.22	4.6
24	0.71	0.57	0.55	e0.30	e8.0	e2.5	7.7	4.3	1.1	0.68	0.22	2.2
25	1.4	0.47	0.47	e0.38	e4.4	2.9	46	4.6	295	0.48	0.19	1.6
26	1.7	0.53	0.37	e0.31	e2.1	2.2	69	4.2	498	0.38	0.21	1.4
27	1.1	0.42	0.43	e0.18	e1.1	2.0	24	3.4	58	0.39	0.23	1.2
28	0.87	0.46	0.56	e0.27	e1.3	2.4	11	2.6	24	2.2	0.29	1.1
29	0.75	0.65	0.66	e0.38	---	2.1	6.3	2.3	14	4.3	0.49	0.96
30	1.2	0.52	0.87	e0.57	---	2.0	7.4	2.1	8.0	2.2	0.68	0.95
31	1.0	---	0.64	e0.65	---	1.9	---	1.9	---	1.4	1.5	---
TOTAL	25.49	24.25	18.88	20.23	63.17	87.67	300.4	1,696.1	1,079.8	238.95	16.16	102.50
MEAN	0.82	0.81	0.61	0.65	2.26	2.83	10.0	54.7	36.0	7.71	0.52	3.42
MAX	2.1	1.6	0.90	1.1	10	18	69	443	498	85	1.5	27
MIN	0.22	0.42	0.34	0.18	0.04	0.71	1.3	1.9	1.0	0.38	0.18	0.37
AC-FT	51	48	37	40	125	174	596	3,360	2,140	474	32	203
CFSM	0.00	0.00	0.00	0.00	0.01	0.02	0.06	0.33	0.21	0.05	0.00	0.02
IN.	0.01	0.01	0.00	0.00	0.01	0.02	0.07	0.38	0.24	0.05	0.00	0.02

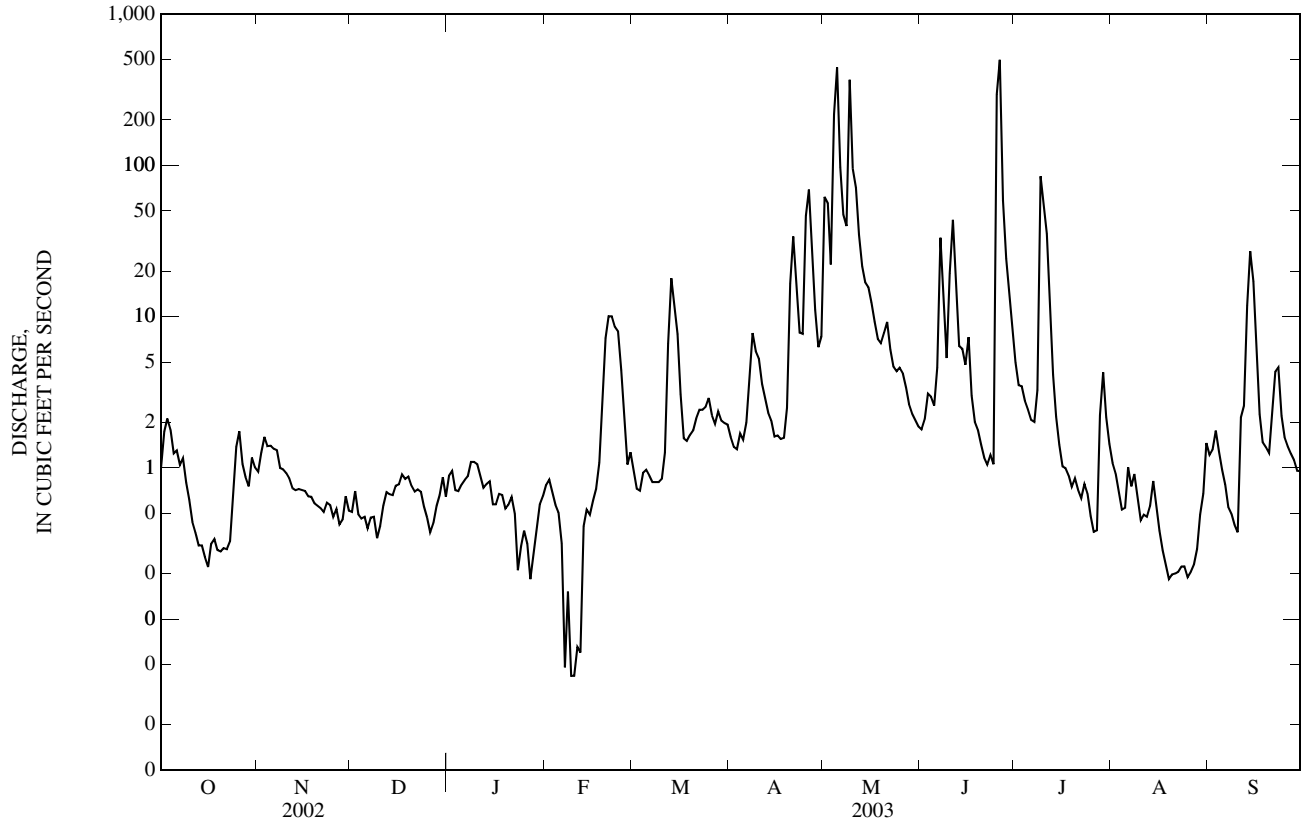
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2003, BY WATER YEAR (WY)

MEAN	92.7	55.2	58.8	34.7	98.3	180	230	235	160	172	44.4	130
MAX	498	357	440	335	534	853	730	1,043	625	2,351	300	2,227
(WY)	(1978)	(1993)	(1983)	(1974)	(2001)	(1979)	(1991)	(1995)	(2001)	(1993)	(1993)	(1992)
MIN	0.15	0.39	0.40	0.19	0.88	2.74	1.21	1.89	1.18	0.24	0.52	0.45
(WY)	(1989)	(1990)	(1977)	(1977)	(1989)	(2000)	(1989)	(2000)	(1988)	(1977)	(2003)	(2000)

06903700 SOUTH FORK CHARITON RIVER NEAR PROMISE CITY, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1968 - 2003	
ANNUAL TOTAL	16,364.46		3,673.60			
ANNUAL MEAN	44.8		10.1		124	
HIGHEST ANNUAL MEAN					446	1993
LOWEST ANNUAL MEAN					10.1	2003
HIGHEST DAILY MEAN	3,540	May 11	498	Jun 26	34,700	Sep 15, 1992
LOWEST DAILY MEAN	0.22	Oct 16	0.04	Feb 9a	0.00	Jul 6, 1977b
ANNUAL SEVEN-DAY MINIMUM	0.28	Oct 15	0.10	Feb 6	0.00	Aug 16, 1989
MAXIMUM PEAK FLOW			1,160	Jun 25c	70,600	Sep 15, 1992
MAXIMUM PEAK STAGE			9.73	Jun 26	34.84	Sep 15, 1992
INSTANTANEOUS LOW FLOW			0.00	Aug 19d		
ANNUAL RUNOFF (AC-FT)	32,460		7,290		90,010	
ANNUAL RUNOFF (CFSM)	0.27		0.060		0.74	
ANNUAL RUNOFF (INCHES)	3.62		0.81		10.05	
10 PERCENT EXCEEDS	54		13		197	
50 PERCENT EXCEEDS	2.0		1.1		13	
90 PERCENT EXCEEDS	0.57		0.36		0.86	

a Ice affected.
b Also July 7, 21-24, 28 to Aug. 1, 1977, July 9, 10, and Aug. 14, 18-22, 1989.
c Also June 26.
d Also Aug. 20, 25.
e Estimated.



06903880 RATHBUN LAKE NEAR RATHBUN, IA

LOCATION.--Lat 40°49'30", long 92°53'33", in NW¼ NE¼ sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, at control tower of Rathbun Dam, 1.8 mi north of Rathbun, 3.9 mi upstream from Walnut Creek, and at mile 142.3.

DRAINAGE AREA.--549 mi^2.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929.

REMARKS.--Reservoir is formed by earthfill dam completed in 1969. Storage began in November 1969. Release is controlled by two hydraulically controlled slide gages, 6 ft wide and 12 ft high, into forechamber of an 11-ft diameter horseshoe conduit through the dam. No dead storage. Maximum design discharge through gates is 5,000 ft^3/s. Uncontrolled notch spillway is concrete overflow section 500 ft in length, located about 3,000 ft west of the right abutment of the dam and provides emergency discharge into the adjacent drainage area of Little Walnut Creek. Uncontrolled notch spillway is at elevation 926 ft, contents 545,621 acre-ft, surface area, 20,974 acres. Conservation pool level is at elevation 904.0 ft, contents 199,830 acre-ft, surface area, 10,989 acres. Reservoir is used for flood control, low-flow augumentation, conservation and recreation. Prior to October 1, 2000 published as mean daily contents in acre feet, and as mean daily elevation in feet NGVD thereafter.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

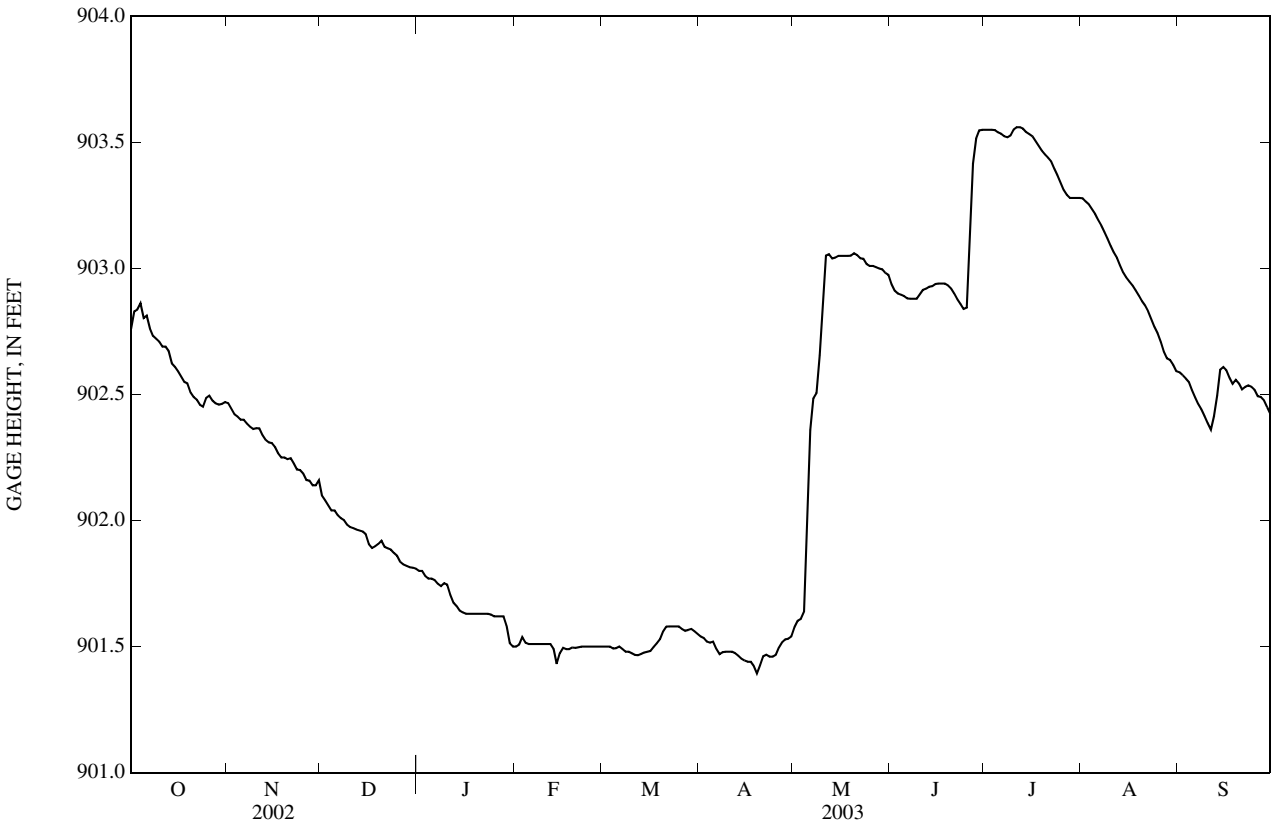
EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 927.16 ft July 28, 1993; minimum elevation, 855.40 ft Oct. 6-10, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum elevation 903.56 ft July 10-13; minimum elevation, 901.39 ft Apr. 19.

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	902.76	902.47	902.10	901.80	901.50	901.50	901.54	901.58	902.94	903.55	903.28	902.59
2	902.83	902.44	902.08	901.80	901.51	901.50	901.53	901.60	902.91	903.55	903.27	902.58
3	902.84	902.42	902.06	901.78	901.54	901.50	901.52	901.61	902.90	903.55	903.25	902.56
4	902.86	902.41	902.04	901.77	901.52	901.49	901.52	901.64	902.90	903.55	903.24	902.55
5	902.80	902.40	902.04	901.77	901.51	901.49	901.52	902.07	902.89	903.54	903.22	902.52
6	902.81	902.40	902.02	901.76	901.51	901.50	901.49	902.36	902.88	903.53	903.19	902.49
7	902.76	902.38	902.01	901.75	901.51	901.49	901.47	902.48	902.88	903.52	903.17	902.46
8	902.73	902.37	902.00	901.74	901.51	901.48	901.48	902.51	902.88	903.52	903.15	902.44
9	902.72	902.36	901.98	901.75	901.51	901.48	901.48	902.66	902.88	903.53	903.12	902.42
10	902.71	902.37	901.97	901.75	901.51	901.47	901.48	902.84	902.90	903.55	903.09	902.39
11	902.69	902.37	901.97	901.71	901.51	901.47	901.48	903.05	902.91	903.56	903.06	902.36
12	902.69	902.34	901.96	901.67	901.51	901.47	901.47	903.06	902.92	903.56	903.04	902.41
13	902.67	902.32	901.96	901.66	901.49	901.47	901.46	903.04	902.93	903.55	903.01	902.50
14	902.62	902.31	901.96	901.64	901.43	901.48	901.45	903.04	902.93	903.54	902.98	902.60
15	902.61	902.31	901.95	901.64	901.47	901.48	901.45	903.05	902.94	903.53	902.96	902.61
16	902.59	902.29	901.91	901.63	901.49	901.48	901.44	903.05	902.94	903.52	902.95	902.60
17	902.57	902.27	901.89	901.63	901.49	901.50	901.44	903.05	902.94	903.51	902.93	902.57
18	902.55	902.25	901.90	901.63	901.49	901.51	901.42	903.05	902.94	903.49	902.91	902.54
19	902.54	902.25	901.91	901.63	901.50	901.53	901.39	903.05	902.93	903.47	902.89	902.56
20	902.51	902.24	901.92	901.63	901.49	901.56	901.43	903.06	902.92	903.45	902.87	902.54
21	902.49	902.25	901.90	901.63	901.50	901.58	901.46	903.05	902.90	903.44	902.85	902.52
22	902.48	902.23	901.89	901.63	901.50	901.58	901.47	903.04	902.88	903.42	902.83	902.53
23	902.46	902.20	901.88	901.63	901.50	901.58	901.46	903.04	902.86	903.40	902.80	902.54
24	902.45	902.20	901.87	901.63	901.50	901.58	901.46	903.02	902.84	903.37	902.77	902.53
25	902.49	902.19	901.86	901.62	901.50	901.58	901.47	903.01	902.84	903.34	902.74	902.52
26	902.50	902.16	901.84	901.62	901.50	901.57	901.50	903.01	903.16	903.31	902.71	902.49
27	902.48	902.16	901.83	901.62	901.50	901.56	901.52	903.01	903.42	903.29	902.67	902.49
28	902.46	902.14	901.82	901.62	901.50	901.57	901.53	903.00	903.52	903.28	902.64	902.48
29	902.46	902.14	901.82	901.58	---	901.57	901.53	903.00	903.55	903.28	902.64	902.45
30	902.46	902.16	901.81	901.51	---	901.56	901.54	902.98	903.55	903.28	902.62	902.42
31	902.47	---	901.81	901.50	---	901.55	---	902.97	---	903.28	902.59	---
MEAN	902.61	902.29	901.93	901.67	901.50	901.52	901.48	902.74	902.99	903.46	902.95	902.51
MAX	902.86	902.47	902.10	901.80	901.54	901.58	901.54	903.06	903.55	903.56	903.28	902.61
MIN	902.45	902.14	901.81	901.50	901.43	901.47	901.39	901.58	902.84	903.28	902.59	902.36

06903880 RATHBUN LAKE NEAR RATHBUN, IA—Continued



06903900 CHARITON RIVER NEAR RATHBUN, IA

LOCATION.--Lat 40°49'22", long 92°53'22", in SE$^1/_4$ NE$^1/_4$ sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, on left bank 600 ft downstream from outlet of Rathbun Dam, 1.8 mi north of Rathbun, 3.7 mi upstream from Walnut Creek, and at mile 142.1.

DRAINAGE AREA.--549 mi^2.

PERIOD OF RECORD.--October 1956 to current year. Monthly discharge only for some periods, published in WSP 1730.

REVISED RECORDS.--WSP 1560: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 847.92 ft above NGVD of 1929. Prior to Nov. 16, 1960, nonrecording gage and Nov. 17, 1960 to Sept. 30, 1969, recording gage, at site 3.1 mi downstream at datum 4.65 ft lower.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,800 ft^3/s Mar. 31, 1960, gage height, 25.3 ft from floodmark, site and datum then in use.

REMARKS.--Records good except for those periods of estimated daily discharge, which are poor. U.S. Army Corps of Engineers data collection platform with telephone modem at station. Flow regulated by Rathbun Lake (station 06903880) since Nov. 21, 1969. Records of discharge include diversions of: Oct. 1 to Oct. 18, 10 ft^3/s; Oct. 19 to July 21, 7.0 ft3/s; July 22 to Sept. 30, 11 ft3/s. The flow is diverted from the reservoir for fish ponds downstream from dam. Diverted flow returns to stream 0.1 mi downstream from gage. Rathbun Regional Water Association permit No. 0400900 allows withdrawal from Rathbun Dam discharge immediately downstream from gage for maximum rate of 4,200 gpm (9.36 ft^3/s). In the 2003 water year, 1.90 billion gallons were withdrawn from the river.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	23	23	e21	21	21	19	24	24	19	28	27
2	26	24	23	21	21	21	19	24	24	19	29	25
3	25	24	22	21	21	21	19	24	24	19	30	25
4	24	23	22	21	21	20	19	26	24	19	25	25
5	23	23	22	21	21	20	19	26	24	20	26	25
6	23	23	23	21	21	20	19	26	24	20	26	26
7	23	24	e22	21	21	20	19	26	24	21	26	26
8	24	24	e22	20	21	20	19	26	24	19	26	25
9	25	24	23	20	22	20	19	27	25	20	26	26
10	25	24	22	20	22	20	20	27	24	20	26	26
11	26	e24	23	e20	21	20	22	27	23	20	26	26
12	24	24	22	19	21	20	22	27	22	20	26	27
13	22	24	23	19	21	20	22	27	22	20	25	27
14	22	23	22	20	21	20	22	27	22	20	25	26
15	22	23	22	20	21	20	22	27	21	21	25	25
16	22	23	22	20	21	20	22	27	21	21	26	26
17	22	23	22	20	e21	20	21	27	21	22	26	25
18	22	23	22	e20	20	20	21	25	20	23	26	26
19	19	23	22	20	20	20	22	25	19	22	26	25
20	21	23	22	e20	20	20	22	24	18	22	26	25
21	23	23	22	19	20	20	22	24	18	22	25	25
22	23	23	22	19	20	20	22	24	17	27	25	25
23	23	23	22	19	e20	19	22	24	18	28	25	25
24	23	23	22	20	20	20	22	e23	18	29	25	25
25	23	23	e22	20	21	19	22	e23	e18	31	25	25
26	23	23	e23	20	21	19	23	23	e18	30	25	25
27	23	23	e23	20	21	19	23	23	18	28	26	26
28	24	e23	23	20	20	19	23	23	19	29	26	26
29	24	23	22	21	---	19	23	24	20	29	27	26
30	24	23	22	21	---	19	23	23	19	27	27	26
31	24	---	e21	21	---	19	---	24	---	28	28	---
TOTAL	722	699	690	625	582	615	634	777	633	715	809	768
MEAN	23.3	23.3	22.3	20.2	20.8	19.8	21.1	25.1	21.1	23.1	26.1	25.6
MAX	26	24	23	21	22	21	23	27	25	31	30	27
MIN	19	23	21	19	20	19	19	23	17	19	25	25
AC-FT	1,430	1,390	1,370	1,240	1,150	1,220	1,260	1,540	1,260	1,420	1,600	1,520

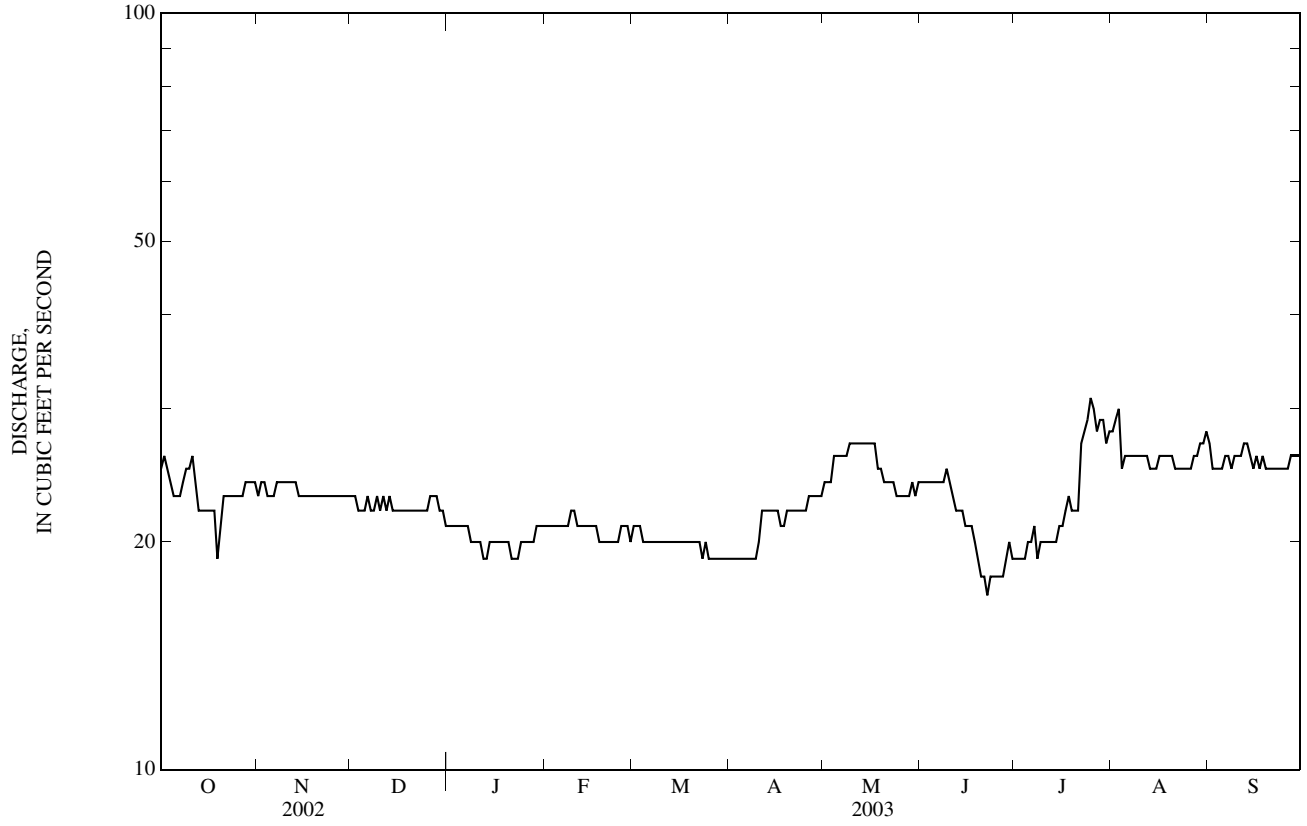
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2003, BY WATER YEAR (WY)

MEAN	259	268	398	230	303	436	356	435	476	560	461	295
MAX	1,790	1,828	1,364	1,546	1,550	1,271	1,480	1,281	1,573	1,377	1,826	1,707
(WY)	(1994)	(1994)	(1993)	(1993)	(1993)	(1993)	(2001)	(1973)	(1973)	(2001)	(1993)	(1993)
MIN	11.5	9.97	5.54	8.98	5.60	9.40	6.74	19.3	16.6	6.53	9.10	11.0
(WY)	(1975)	(1975)	(1970)	(1970)	(1970)	(1970)	(1970)	(1977)	(1988)	(1970)	(1970)	(1974)

06903900 CHARITON RIVER NEAR RATHBUN, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1970 - 2003a	
ANNUAL TOTAL	55,065		8,269			
ANNUAL MEAN	151		22.7		374	
HIGHEST ANNUAL MEAN					1,164	1993
LOWEST ANNUAL MEAN					20.4	1989
HIGHEST DAILY MEAN	1,580	May 18	31	Jul 25	1,950	Oct 17, 1993
LOWEST DAILY MEAN	17	Jul 19	17	Jun 22	0.00	Oct 26, 1977
ANNUAL SEVEN-DAY MINIMUM	20	Jul 19	18	Jun 20	1.0	Apr 1, 1970
MAXIMUM PEAK FLOW			31	Jul 22	2,780	Dec 14, 1993
MAXIMUM PEAK STAGE			5.11	Jun 26	14.94	Dec 14, 1993
INSTANTANEOUS LOW FLOW			17	Jun 22	0.00	Oct 26, 1977
ANNUAL RUNOFF (AC-FT)	109,200		16,400		270,800	
10 PERCENT EXCEEDS	622		26		1,190	
50 PERCENT EXCEEDS	24		22		40	
90 PERCENT EXCEEDS	22		19		16	

a Post regulation.
e Estimated.



06904010 CHARITON RIVER NEAR MOULTON, IA

LOCATION.--Lat 40°41'30", long 92°46'15", in SE¼ NE¼ sec.14, T.68 N., R.17 W., Appanoose County, Hydrologic Unit 10280201, on right bank 6 ft downstream from bridge on County Highway J45 (543rd St.), 0.7 mi downstream from Hickory Creek, 5.0 mi west of Moulton, 8.0 mi upstream from Iowa-Missouri border, 20.8 mi downstream from Rathbun Dam, and at mile 121.5.

DRAINAGE AREA.--740 mi^2.

PERIOD OF RECORD--August 1979 to current year.

GAGE--Water stage recorder. Datum of gage is 800.00 ft above NGVD of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by Rathbun Reservoir (station 06903880) 20.8 mi upstream. U.S. Geological Survey satellite and telephone modem data collection platform and U.S. Army Corps of Engineers rain gage at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of about 45 ft, discharge unknown, from information by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	36	e27	e25	e35	e35	36	90	38	59	38	49
2	41	35	e26	e25	e34	e33	37	108	38	53	38	42
3	45	35	e26	e25	e31	e33	35	84	41	51	38	37
4	39	35	e26	e25	e31	e35	38	139	41	46	37	36
5	36	34	e26	e24	e29	e36	43	711	39	46	36	36
6	35	33	e26	e25	e30	e35	38	330	45	56	37	36
7	36	32	e27	e25	e30	e41	54	140	45	52	37	35
8	34	31	e26	e26	e30	e36	58	95	40	50	36	35
9	30	31	e26	e24	e31	e35	49	298	41	85	37	36
10	30	31	e28	e26	e32	e36	46	574	64	110	37	35
11	33	30	e26	e28	e33	e45	45	1,010	61	73	38	37
12	33	29	e26	e28	e32	e118	46	379	47	58	38	89
13	34	29	e25	e31	e33	e172	44	156	42	49	37	81
14	34	28	e25	e29	e33	e221	44	103	53	47	36	118
15	34	27	e26	e30	e32	e146	43	98	53	43	35	55
16	34	27	e24	e29	e34	e89	42	82	42	41	35	43
17	34	28	e24	e30	e32	e66	42	69	40	40	35	41
18	33	28	e26	e30	e35	58	43	59	38	39	34	39
19	30	28	e25	e29	e40	57	49	55	36	40	36	42
20	29	27	e24	e29	e43	70	112	59	34	42	38	40
21	31	27	e25	e30	e49	56	101	57	32	38	34	44
22	36	27	e24	e30	e51	49	75	54	32	36	34	124
23	35	27	e24	e29	e45	44	56	52	32	38	34	63
24	38	28	e24	e31	e39	40	58	50	30	38	35	47
25	50	27	e25	e31	e32	37	207	54	212	38	36	37
26	43	e25	e26	e32	e36	36	176	48	1,730	38	38	36
27	35	e26	e25	e31	e36	35	106	44	315	38	37	37
28	34	e26	e25	e32	e35	36	71	43	126	51	38	34
29	37	e25	e25	e32	---	36	61	43	83	49	43	35
30	38	e26	e25	e32	---	36	59	40	67	41	40	34
31	37	---	e24	e35	---	36	---	39	---	37	42	---
TOTAL	1,102	878	787	888	983	1,838	1,914	5,163	3,537	1,522	1,144	1,453
MEAN	35.5	29.3	25.4	28.6	35.1	59.3	63.8	167	118	49.1	36.9	48.4
MAX	50	36	28	35	51	221	207	1,010	1,730	110	43	124
MIN	29	25	24	24	29	33	35	39	30	36	34	34
AC-FT	2,190	1,740	1,560	1,760	1,950	3,650	3,800	10,240	7,020	3,020	2,270	2,880
CFSM	0.05	0.04	0.03	0.04	0.05	0.08	0.09	0.23	0.16	0.07	0.05	0.07
IN.	0.06	0.04	0.04	0.04	0.05	0.09	0.10	0.26	0.18	0.08	0.06	0.07

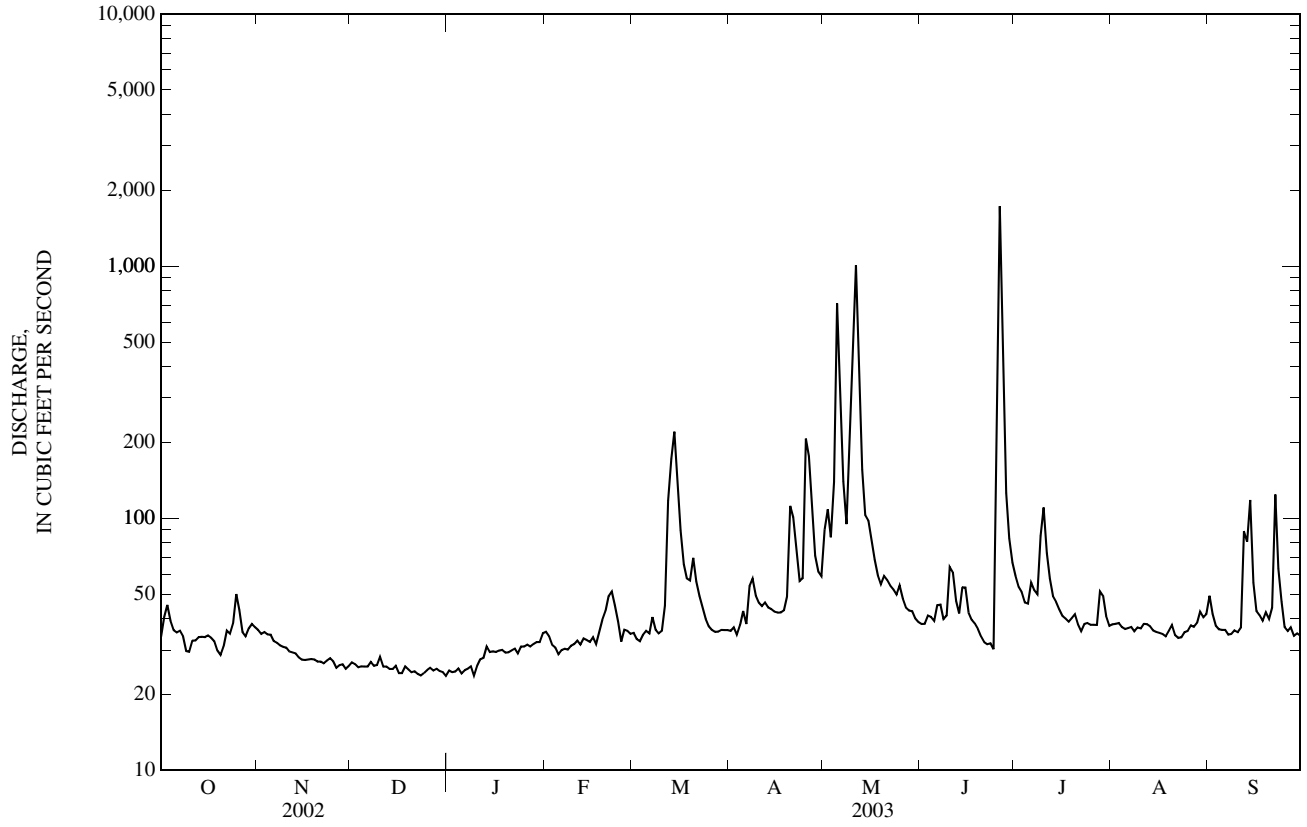
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 2003, BY WATER YEAR (WY)

MEAN	379	370	491	294	423	669	628	714	684	871	607	431
MAX	1,874	1,931	1,557	1,696	1,772	1,831	1,731	1,421	1,593	2,849	2,004	1,976
(WY)	(1994)	(1994)	(1983)	(1993)	(1983)	(1993)	(2001)	(1995)	(2001)	(1982)	(1993)	(1993)
MIN	24.2	23.0	20.1	22.2	20.6	24.3	22.7	32.2	20.3	17.9	21.0	26.6
(WY)	(1989)	(1989)	(1990)	(1989)	(1989)	(1989)	(1989)	(2000)	(1988)	(1988)	(1988)	(1988)

06904010 CHARITON RIVER NEAR MOULTON, IA—Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1980 - 2003	
ANNUAL TOTAL	83,370		21,209			
ANNUAL MEAN	228		58.1		548	
HIGHEST ANNUAL MEAN					1,555	1993
LOWEST ANNUAL MEAN					43.6	1989
HIGHEST DAILY MEAN	4,300	May 12	1,730	Jun 26	8,720	Jul 17, 1982
LOWEST DAILY MEAN	24	Dec 16	24	Dec 16a	14	Jun 22, 1988b
ANNUAL SEVEN-DAY MINIMUM	24	Dec 19	24	Dec 19	15	Jun 22, 1988
MAXIMUM PEAK FLOW			2,320	Jun 26	11,200	Jul 16, 1982
MAXIMUM PEAK STAGE			27.79	Jun 26	36.83	Jul 16, 1982
ANNUAL RUNOFF (AC-FT)	165,400		42,070		396,900	
ANNUAL RUNOFF (CFSM)	0.31		0.079		0.74	
ANNUAL RUNOFF (INCHES)	4.19		1.07		10.06	
10 PERCENT EXCEEDS	825		81		1,390	
50 PERCENT EXCEEDS	44		36		202	
90 PERCENT EXCEEDS	27		26		27	

a Also Dec. 17, 20, 22-24, 31, Jan. 5, 9; Ice affected.
b Also June 23, 27, and July 9, 1988.
e Estimated.



Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, but is not published herein. The years given in the period of record represent water years up to the current year for which the annual maximum has been determined.

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
UPPER IOWA RIVER BASIN								
Dry Run Creek near Decorah, IA (05387490)	Lat 43°17'29",long 91°48'33"in SE1/4, sec.20, T.98 N., R.8 W., Winneshiek County, Hydrologic Unit 07060002, on State Highway 9, 0.5 mi west of Decorah. Drainage area 21.0 mi^2.	1978-	05-11-03	17.46	1,150	08-16-93	20.80	4,620
Waterloo Creek near Dorchester, IA (05388310)	Lat 43°27'04", long 91°30'18", in NW1/4, sec.25, T.100 N., R.6 W., Allamakee County, Hydrologic Unit 07060002, on State Highway 76, 1.4 mi south of Dorchester. Drainage area 46.6 mi^2.	1966-	2003	(a)	<610	07-01-78	14.80	9,380
MISSISSIPPI RIVER BASIN								
Mississippi River tributary at McGregor, IA (05389501)	Lat 43°01'12", long 91°11'25", in N1/4, sec.27, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001,at culvert on County Road X50, at intersection with U.S. Highway 18 (Business Route), in McGregor. Drainage area 0.72 mi^2.	1991-	05-11-03	11.03	d12	03-31-93	13.13	d250
			Revised	Record:				
			08-25-90	12.28	d160			
			06-15-91	13.08	d240			
			11-01-91	11.98	d140			
			03-31-93	13.13	d250			
			06-23-94	11.92	d70			
			03-11-95	12.86	d22			
			06-17-96	11.97	d90d			
			06-21-97	11.03	d16			
			03-30-98	11.58	d54			
			04-09-99	11.17	d24			
			06-01-00	(+)	(+)			
			08-02-01	10.95	d50			
			2002	(a)	d<11			
TURKEY RIVER BASIN								
French Hollow Creek near Elkader, IA (05412030)	Lat 42°50'19", long 91°24'25", in SW1/4, sec.26, T.93 N.,R.5 W., Clayton County, Hydrologic Unit 07060004, at culvert on State Highway 13, 1.1 mi south of Elkader. Drainage area 3.56 mi^2.	1991-	05-11-03	10.15	d240	05-17-99	d19.9	d3,100
LITTLE MAQUOKETA RIVER BASIN								
Little Maquoketa River at Graf, IA (05414350)	Lat 42°30'09", long 90°51'50", in SE1/4 NW1/4, sec.20, T.89 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 300 ft downstream from Illinois Central railroad bridge, 0.5 mi northeast of Graf. Drainage area 39.6 mi^2.	1951-	05-14-03	10.65	2,890	6-4-02	15.93	7,700

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Middle Fork Little Maquoketa River near Rickardsville, IA (05414400)	Lat 42°33'38", long 90°51'35", in SE1/4, sec.32, T.90 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 2 mi southeast of Rickardsville. Drainage area 30.2 mi^2.	1951-	05-14-03	15.35	1,630	08-02-72	27.70	23,000
North Fork Little Maquoketa River near Rickardsville, IA (05414450)	Lat 42°35'09", long 90°51'20", near NW corner, sec.28, T.90 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 1 mi northeast of Rickardsville. Drainage area 21.6 mi^2.	1951-	07-08-03	4.22	286	08-02-72	14.02	7,180
Bloody Run tributary near Sherrill, IA (05414605)	Lat 42°37'13", long 90°45'44", in SE1/4, sec.7, T.90 N., R.2 E., Dubuque County, Hydrologic Unit 07060003, at culvert on county road 1.6 mi northeast of Sherrill. Drainage area 0.59 mi^2	1991-	2003	(a)	[d]<33	06-15-91	19.27	[d]692
MAQUOKETA RIVER BASIN								
Lamont Creek tributary at Lamont, IA (05416200)	Lat 42°35'22", long 91°38'52", in SE1/4, sec.22, T.90 N., R.7 W., Buchanan County, Hydrologic Unit 07060006, at culvert on State Highway 187, 0.8 mi southwest of Lamont. Drainage area 1.78 mi^2.	1991-	05-01-03	16.82	[d]240	06-01-00	20.13	[d]635
Sand Creek near Manchester, IA (05416972)	Lat 42°26'57", long 91°28'50", in SE1/4, sec.12, T.88 N., R.6 W., Delaware County, Hydrologic Unit 07060006, at culvert on State Highway 13, 2.7 mi southwest of Manchester. Drainage area 11.0 mi^2.	1991-	05-11-03	10.57	[d]490	06-04-02	19.31	[d]4,290
Williams Creek near Charlotte, IA (05418645)	Lat 41°55'55", long 90°31'44", in SE1/4, sec.6, T.82 N., R.4 E., Clinton County, Hydrologic Unit 07060006, at culvert on County Road Y7, 2.1 mi north of County Highway E63, 5 mi southwest of Charlotte. Drainage area 1.77 mi^2.	1990-	10-04-02	9.91	[d]560	05-29-96	13.02	[d]990
			Revised	Record:				
			09-09-89	8.23	[d]260			
			06-16-90	11.78	[d]720			
			03-01-91	8.53	[d]85			
			09-17-92	7.89	[d]210			
			07-06-93	11.72	[d]780			
			05-29-96	13.02	[d]990			
			02-22-97	8.59	[d]310			
			03-31-98	9.45	[d]450			
			07-03-99	10.62	[d]340			
WAPSIPINICON RIVER BASIN								
Little Wapsipinicon River tributary near Riceville, IA (05420600)	Lat 43°21'31", long 92°29'08", near SW1/4 corner, sec. 27, T.99 N., R.14 W., Howard County, Hydrologic Unit 07080102, at culvert on county highway, 3.5 mi east of Riceville. Drainage area 1.10 mi^2.	1953-	05-06-03	3.44	44.7	06-14-00	7.66	[d]2,100
Little Wapsipinicon River near Oran, IA (05420850)	Lat 42°42'53", long 92°02'29", near NW corner, sec.9, T.91 N., R.10 W., Fayette County, Hydrologic Unit 07080102, at bridge on State Highway 3, 2 mi northeast of Oran. Drainage area 94.1 mi^2.	1966-	05-11-03	85.52	748	05-17-99	94.15	12,800
Buck Creek near Oran, IA (05420875)	Lat 42°42'53", long 92°07'33", in NE1/4, sec.10, T.91 N., R.11 W., Bremer County, Hydrologic Unit 07080102, at bridge on State Highway 3, 2.5 mi northwest of Oran. Drainage area 37.9 mi^2.	1966-	05-11-03	87.34	356	05-17-99	91.02	[d]5,600

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Pine Creek tributary near Winthrop, IA (05421100)	Lat 42°29'17", long 91°47'10", in SW1/4, sec.27, T.89 N., R.8 W., Buchanan County, Hydrologic Unit 07080102, at culvert on county road, 2.5 mi northwest of Winthrop. Drainage area 0.33 mi^2.	1953-	05-01-03	3.59	[d]24	07-17-68	8.97	[d]334
Wapsipinicon River tributary at Winthrop, IA (05421300) (formerly published as: "Pine Creek trib. no. 2 at Winthrop")	Lat 42°28'06", long 91°44'33", at N1/4 corner sec.2, T.88 N., R.8 W., Buchanan County, Hydrologic Unit 07080102, at culvert on State Highway 939, near west city limits of Winthrop. Drainage area 0.70 mi^2.	1953-	05-01-03	4.13	(+)	07-17-68	7.26	570
	IOWA RIVER BASIN							
Silver Creek at Welton, IA (05421890)	Lat 41°54'54", long 90°36'00", in NW1/4, sec.15, T.82 N., R.3 E., Clinton County, Hydrologic Unit 07080103, at bridge on U.S. Highway 61, at north edge of Welton. Drainage area 9.03 mi^2.	1966-	2003	(a)	<11	05-17-74	89.77	[d]4,820
Westmain drainage ditch 1 & 2 at Britt, IA (05448400) Low-flow site April 1958 to Sept. 1976	Lat 43°06'09", long 93°47'04", in SW1/4, sec.27, T.96 N., R.25 W., Hancock County, Hydrologic Unit 07080207, at bridge on U.S. Highway 18, near east city limits of Britt. Drainage area 21.2 mi^2.	1966-	06-26-03	81.88	122	04-28-75	83.59	372
East Branch Iowa River above Hayfield, IA (05448600)	Lat 43°09'21", long 93°41'21", at S1/4 corner sec.4, T.96 N., R.24 W., Hancock County, Hydrologic Unit 07080207, at bridge on county highway, 1.5 mi southeast of Hayfield. Drainage area 2.23 mi^2.	1953-	06-29-03	2.73	16.0	04-11-01	8.12	(+)
Honey Creek tributary near Radcliffe, IA (0545129280)	Lat 42°19'44", long 93°25'28", in SW1/4, sec.21, T.87 N., R.22 W., Hardin County, Hydrologic Unit 07080207, at culvert on county road highway S27, 1.1 mi northeast of Radcliffe. Drainage area 3.29 mi^2.	1991-	07-09-03	96.05	[d]40	05-10-95	100.14	[d]510
Stein Creek near Clutier, IA (05451955)	Lat 42°04'46", long 92°18'00", in NE1/4, sec.24, T.84 N., R.13 W., Tama County, Hydrologic Unit 07080208, at bridge on county highway E36, 5 mi east of Clutier. Drainage area 23.4 mi^2.	1971-	05-12-03	72.05	482	06-15-82	77.92	11,400
Price Creek at Amana, IA (05453200)	Lat 41°48'18", long 91°52'23", in SE1/4, sec.22, T.81 N., R.9 W., Iowa County, Hydrologic Unit 07080208, at bridge on State Highway 151, near north edge of Amana. Drainage area 29.1 mi^2.	1966-	05-09-03	87.08	3,400	06-17-90	88.80	5,080
North Fork tributary to Mill Creek near Solon, IA (05453430)	Lat 41°50'24", long 91°30'04" in NW1/4, sec.12, T.81 N., R.6 W., Johnson County, Hydrologic Unit 07080208, at culvert on State Highway 1, 2 mi north of Solon. Drainage area 0.78 mi^2.	1990-	10-04-02	(a)	[d]<91	07-16-92	(+)	(+)
Clear Creek tributary near Williamsburg, IA (05454180)	Lat 41°41'16", long 91°57'02", in SE1/4, sec.36, T.80 N., R.10 W., Iowa County, Hydrologic Unit 07080209, at culvert on county road, 4 mi northeast of Williamsburg, 1 mi south of county highway F35. Drainage area 0.37 mi^2.	1990-	07-09-03	44.90	[d]5	06-17-90	48.76	[d]291

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
North English River near Montezuma, IA (05455140)	Lat 41°38'51", long 92°34'16", in SW1/4, sec.14, T.79 N., R.15 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on county highway, 5.0 mi northwest of Montezuma. Drainage area 31.0 mi^2.	1972-	10-03-02	22.86	1,760	07-20-78	28.18	4,640
North English River at Guernsey, IA (05455210)	Lat 41°38'42", long 92°21'28", at NW corner sec.22, T.79 N., R.13 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on State Highway 21, 1 mi southwest of Guernsey. Drainage area 81.5 mi^2.	1960, 1966-	10-03-02	83.04	2,830	06-15-82	87.43	7,460
Deep River at Deep River, IA (05455230)	Lat 41°35'29", long 92°21'18", in SW1/4, sec.3, T.78 N., R.13 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on State Highway 21, 1 mi northeast of Deep River. Drainage area is 30.5 mi^2.	1960, 1966-	2003	(a)	<856	05-14-70	[c]83.85	6,200
Bulgers Run near Riverside, IA (05455550)	Lat 41°29'02", long 91°37'36", in SE1/4, sec.11, T.77 N., R.7 W., Washington County, Hydrologic Unit 07080209, at bridge on State Highway 22, 2.5 mi west of Riverside. Drainage area 6.31 mi^2.	1965-	07-09-03	85.48	456	09-21-65	89.04	3,080
Deer Creek near Carpenter, IA (05457440)	Lat 43°24'54", long 92°59'05", in NW1/4 sec.9, T.99 N., R.18 W., Mitchell County, Hydrologic Unit 07080201, at bridge on State Highway 105, 1.5 mi east of Carpenter. Drainage area 91.6 mi^2.	1966-	05-06-03	80.75	1,760	07-18-93	84.65	3,460
Gizzard Creek tributary near Bassett, IA (0545776680)	Lat 43°04'01",long 92°34'31", in SE1/4, sec.2, T.95 N., R.15 W., Floyd County, Hydrologic Unit 07080201, at culvert on U.S. Highway 18, 3.3 mi west of Bassett. Drainage area 3.42 mi^2.	1990-	05-06-03	97.45	(+)	07-21-99	103.00	(+)
Spring Creek near Mason City, IA (05459490)	Lat 43°12'48", long 93°12'38", in SE1/4, sec.16, T.97 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, at bridge on U.S. Highway 65, 4 mi north of Mason City. Drainage area 29.3 mi^2.	1966-	2003	(a)	<26.8	07-21-99	91.05	2,030
						07-08-69	88.41	[e]3,200
			Revised	Record:				
			05-30-80	90.32	3,320			
			06-24-82	84.46	270			
			08-04-02	83.67	90			
Willow Creek near Mason City, IA (05460100)	Lat 43°08'55", long 93°16'07", near center sec.12, T.96 N., R.21 W., Cerro Gordo County, Hydrologic Unit 07080203, at bridge on U.S. Highway 18, 3.5 mi west of Mason City. Drainage area 78.6 mi^2.	1966-	05-06-03	89.07	448	07-21-99	21.92	1,150
Miller Creek near Eagle Center, IA (05464025)	Lat 42°19'22", long 92°20'50", in NW1/4, sec.27, T.87 N., R.13 W., Black Hawk County, Hydrologic Unit 07080205, at culvert on State Highway 21, 1.3 mi southeast of Eagle Center. Drainage area is 9.14 mi^2.	1991-	05-21-03	42.44	[d]390	06-11-98	47.60	(+)
Prairie Creek tributary near Van Horne, IA (05464535)	Lat 41°59'33", long 92°05'06", in NW1/4, sec.24, T.83 N., R.11 W., Benton County, Hydrologic Unit 07080205, at culvert on County Highway V66, 1.1 mi south of Van Horne. Drainage area is 0.94 mi^2.	1991-	05-11-03	15.05	[d]410	05-26-97	18.14	[d]571

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Thunder Creek at Blairstown, IA (05464562)	Lat 41°54'12", long 92°05'03", in NE1/4, sec.23, T.82 N., R.11 W., Benton County, Hydrologic unit 07080205, at culvert on county highway V66, near city limits of Blairstown. Drainage area 0.96 mi^2.	1991-	05-09-03	14.04	[d]210	08-16-93	16.12	[d]540
North Fork Long Creek at Ainsworth, IA (05465150)	Lat 41°16'51", long 91°32'16", Long Creek at in SW1/4, sec.22, T.75 N., R.6 W., Washington County, Hydrologic Unit 07080209, at bridge on U.S. Highway 218, 1 mi southeast of Ainsworth. Drainage area 30.2 mi^2.	1951, 1965-	03-14-03	85.42	164	05-10-96	93.40	(+)
	Yellow Spring Creek Basin							
Haight Creek at Kingston, IA (05469350)	Lat 40°58'14", long 91°02'30", in NW1/4, sec.12, T.71 N., R.2 W., Des Moines County, Hydrologic Unit 07080104, at culvert on State Highway 99, 0.5 mi south of Kingston. Drainage area 2.67 mi^2.	1990-	07-08-03	10.99	[d]320	06-16-90	15.18	[d]1,460
	SKUNK RIVER BASIN							
Mud Lake drainage ditch 71, at Jewell, IA (05469860)	Lat 42°18'52", long 93°38'23", in SW1/4, sec.27, T.87 N., R.24 W., Hamilton County, Hydrologic Unit 07080105, at bridge on U.S. Highway 69, in Jewell. Drainage area 65.4 mi^2.	1966-	07-09-03	86.42	958	07-09-93	91.32	3,700
			Revised	Record:				
			06-10-99	87.51	1,210			
			08-06-00	84.76	613			
			05-12-02	85.14	690			
Long Dick Creek near Ellsworth, IA (05469970)	Lat 42°18'37", long 93°32'06", in NW1/4, sec.33, T.87 N., R.23 W., Hamilton County, Hydrologic Unit 07080105, at culvert on State Highway 175, 2.2 mi east of Ellsworth. Drainage area 6.08 mi^2.	1991-	07-09-03	90.07	(+)	08-17-93	94.73	(+)
Keigley Branch near Story City, IA (05469990)	Lat 42°09'01", long 93°37'13", in NW1/4, sec.26, T.85 N., R.24 W., Story County, Hydrologic Unit 07080105, at bridge on U.S. Highway 69, 3 mi south of Story City. Drainage area 31.0 mi^2.	1966-	2003	(a)	<292	06-17-96	92.26	[d]3,440
Snipe Creek tributary at Melbourne, IA (0547209280)	Lat 41°56'08", long 93°05'08", in SE1/4, sec.5, T.82 N., R.19 W., Marshall County, Hydrologic Unit 07080106, at culvert on county highway E63, 0.5 mi east of Melbourne. Drainage area 1.61 mi^2.	1990-	05-09-03	13.82	[d]40	06-17-90	17.39	[d]360
Middle Creek near Lacey, IA (05472390)	Lat 41°25'17", long 92°23'04", at N1/4 corner sec.1, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080106, at bridge on U.S. Highway 63, 1.5 mi northwest of Lacey. Drainage area 23.0 mi^2.	1966-	06-26-03	82.66	91.5	04-24-76	90.06	9,650
Skunk River tributary near Richland, IA (05472555)	Lat 41°15'50", long 91°57'52", in NE1/4, sec.35, T.75 N., R.10 W., Keokuk County, Hydrologic Unit 07080107, at culvert on county highway W15, 4.9 mi north of Richland, 5.1 mi south of State Highway 92. Drainage area 0.19 mi^2.	1990-	05-08-03	12.55	[d]0.6	03-16-01	17.08	[d]120

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
DES MOINES RIVER BASIN								
Drainage Ditch 97 tributary near Britt, IA (0548065350)	Lat 43°06'42", long 93°54'22", in SW1/4, sec.22, T.96 N., R.26 W., Hancock County, Hydrologic Unit 07100005, at culvert on county road, 5.4 mi northwest of Britt. Drainage area 0.94 mi^2. (Revised)	1991-	06-29-03	95.17	(+)	07-09-93	94.53	(+)
White Fox Creek at Clarion, IA (05480930)	Lat 42°43'55", long 93°42'26", in NW1/4, sec.5, T.91 N., R.24 W., Wright County, Hydrologic Unit 07100005, at bridge on State Highway 3, 1.5 mi east of Clarion. Drainage area 13.3 mi^2.	1966-	07-09-03	93.77	1,120	07-09-93 07-09-03	93.59 93.77	1,400 1,120
			Revised	Record:				
			07-10-00	90.28	305			
			05-28-01	91.37	481			
Brewers Creek tributary near Webster City, IA (05480993)	Lat 42°26'57", long 93°51'59", in NW1/4, sec.10, T.88 N., R.26, W., Hamilton County, Hydrologic Unit 07100005, at culvert on U.S. Highway 20, 2.5 mi southwest of Webster City. Drainage area 1.58 mi^2.	1990-	07-09-03	96.81	[d]131	06-04-91	99.25	[d]544
Bluff Creek at Pilot Mound, IA (05481510)	Lat 42°09'59", long 94°01'11", in NW1/4, sec.20 T.85 N., R.27 W., Boone County, Hydrologic Unit 07100004, at bridge on county road E18 at northwest edge of Pilot Mound. Drainage area 23.5 mi^2. (Revised)	1966-	07-09-03	84.73	375	07-09-93	89.25	1,120
Peas Creek tributary at Boone, IA (05481528)	Lat 42°02'06", long 93°51'13", in SW1/4, sec.35, T.84 N., R.26 W., Boone County, Hydrologic Unit 07100004, at culvert on Corporal Rodger Snedden Drive, at intersection with U.S. Highway 30, at the south edge of Boone city limits. Drainage area 0.30 mi^2.	1990-	05-09-03	91.06	[d]46	06-17-90	95.19	[d]239
Peas Creek at Boone, IA (05481530)	Lat 42°02'04", long 93°51'25", in SE1/4, sec.34, T.84 N., R.26 W., Boone County, Hydrologic Unit 07100004, at culvert on U.S. Highway 30, at the southeast side of Boone city limits. Drainage area 1.69 mi^2.	1990-	07-08-03	98.88	[d]<74	06-15-98	103.05	[d]410
Hardin Creek near Farlin, IA (05482900)	Lat 42°05'34, long 94°25'39", in NE1/4 NW1/4 NW1/4, sec. 14, T.84 N., R.31 W., Greene County, Hydrologic Unit 07100006, at bridge on county highway, 1.5 mi northeast of Farlin. Drainage area 101 mi^2.	1951-	07-09-03	12.00	1,500	07-09-93	13.97	3,010
Brushy Creek near Templeton, IA (05483318)	Lat 41°56'45", long 94°52'45", in SW1/4 NW 1/4 NW 1/4, sec.1, T.82 N., R.35 W., Carroll County, Hydrologic Unit 07100007, at bridge on U.S. Highway 71, 4 mi northeast of Templeton. Drainage area 45.0 mi^2.	1966-	2003	(a)	<1,320	07-09-93	93.48	19,000
Middle Raccoon River tributary at Carroll, IA (05483349)	Lat 42°02'30", long 94°52'43", in NW1/4 NW1/4 SW1/4, sec. 36, T. 84 N,.R.35 W., Carroll County Hydrologic Unit 07100007, at bridge on U.S. Highway 71, 1.1 mi south of Carroll. Drainage area 6.58 mi^2.	1966-	07-09-03	23.36	849	06-17-96	25.88	4,600
Cedar Creek tributary No. 2 near Winterset, IA (05485940)	Lat 41°19'49", long 94°03'05", in SW1/4, sec.35, T.76 N., R.28 W., Madison County, Hydrologic Unit 07100008, at culvert on State Highway 92, 0.5 mi west of U.S. Highway 169, 1 mi west of Winterset. Drainage area 1.02 mi^2.	1990-	05-04-03	93.57	[d]43	05-24-96	98.58	[d]447

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Bush Branch Creek near Stanzel, IA (05486230)	Lat 41°18'57", long 94°16'42", in SW1/4, sec.2, T.75 N., R.30 W., Adair County, Hydrologic Unit 07100008, at culvert on State Highway 92, 1 mi west of Stanzel. Drainage area is 3.02 mi^2.	1990-	05-04-03	90.57	(+)	09-15-92	97.06	(+)
Little White Breast Creek tributary near Chariton, IA (05487825)	Lat 41°03'36", long 93°18'12", in SW1/4, sec. 5, T.72 N., R.21 W., Lucas County, Hydrologic Unit 07100008, at culvert on State Highway 14, 2.0 mi north of Chariton. Drainage area 0.05 mi^2.	1990-	05-04-03	17.26	[d]18	08-19-93	18.93	[d]56.2
South Avery Creek near Blakesburg, IA (05489350)	Lat 41°00'59", long 92°37'32", in SE1/4, sec.19, T.72 N., R.15 W., Wapello County, Hydrologic Unit 07100009, at bridge on U.S. Highway 34, 3.5 mi north of Blakesburg. Drainage area 33.1 mi^2.	1965-	06-26-03	81.94	2,920	07-03-82	90.20	(+)
Bear Creek at Ottumwa, IA (05489490)	Lat 41°00'52", long 92°27'44", in NW1/4, sec.27, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, at bridge on U.S. Highway 34, near west edge of Ottumwa. Drainage area 22.9 mi^2.	1965-	06-26-03	83.72	560	09-21-65	92.80	4,000
BIG SIOUX RIVER BASIN								
Dawson Creek near Sibley, IA (06483440)	Lat 43°23'23", long 95°42'53", near NW corner sec.20, T.99 N., R.41 W., Osceola County, Hydrologic Unit 10170204, at culvert on County Highway A30, 2 mi southeast of Sibley. Drainage area 4.35 mi^2.	1952-	03-17-03	4.41	(+)	06-13-01	9.78	(+)
Burr Oak Creek near Perkins, IA (06483495)	Lat 43°14'43", long 96°10'38", in SE1/4, sec.5, T.97 N., R.45 W., Sioux County, Hydrologic Unit 10170204, at bridge on U.S. Highway 75, 4 mi north of Perkins. Drainage area 30.9 mi^2.	1966-	2003	(a)	<78	06-20-83	88.37	[d]6,400
PERRY CREEK BASIN								
Perry Creek near Merrill, IA (06599800)	Lat 42°43'15", long 96°20'33", in NW1/4, sec.12, T.91, N., R.47 W., Plymouth County, Hydrologic Unit 10230001, at bridge on County Highway C44, 5 mi west of Merrill. Drainage area 8.17 mi^2.	1953-	06-25-03	7.98	217	03-27-62	12.22	(+)
Perry Creek near Hinton, IA (06599950)	Lat 42°37'11", long 96°22'20", in NE1/4, sec.15, T.90 N., R.47 W., Plymouth County, Hydrologic Unit 10230001, at bridge on county highway, 4 mi west of Hinton. Drainage area 33.1 mi^2.	1953-	06-25-03	27.17	401	06-14-81	38.68	[d]5,500
FLOYD RIVER BASIN								
Little Floyd River near Sanborn, IA (06600030)	Lat 43°11'10", long 95°43'30", in NE1/4, sec.31, T.97 N., R.41 W., O'Brien County, Hydrologic Unit 10230002, at bridge on U.S. Highway 18, 3.5 mi west of Sanborn. Drainage area 8.44 mi^2.	1966-	2003	(a)	<104	03-02-70	89.04	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Sweeney Creek tributary near Sheldon, IA (06600036)	Lat 43°11'10", long 95°44'38", in SW1/4, sec.25, T.97 N., R.42 W., O'Brien County, Hydrologic Unit 10230002, at culvert on U.S. Highway 18, 4.8 mi east of Sheldon. Drainage area 0.62 mi^2.	1991-	07-08-03	(a)	[d]<100	07-14-93	99.27	[d]270
			Revised	Record:				
			1991	(a)	[d]<35			
			07-10-92	96.94	[d]84			
			07-14-93	99.27	[d]270			
			1994	(a)	[d]<35			
			08-08-95	(a)	[d]<35			
			03-31-96	(+)	(+)			
			03-20-97	(a)	[d]<100			
			1998	(a)	[d]<100			
			06-10-99	(a)	[d]<100			
			2000	(a)	[d]<100			
			07-25-01	97.65	[d]130			
			03-30-02	(a)	[d]<100			
West Branch Floyd River near Struble, IA (0660030	Lat 42°55'26", long 96°10'36", in SE1/4, sec.29, T.94 N., R.45 W., Sioux County, Hydrologic Unit 10230002, at bridge on county highway B62, 0.1 mi west of U.S. Highway 75, 2.2 mi northeast of Struble. Drainage area 180 mi^2	1996-	07-09-03	9.98	1,060	03-04-94	15.86	8,920
MONONA-HARRISON DITCH BASIN								
Big Whiskey Slough near Remsen, IA (06601480)	Lat 42°48'28", long 95°53'21", in NW1/4, sec.11, T.92 N., R.43 W., Plymouth County, Hydrologic Unit 10230004, at bridge on State Highway 3, 4.2 mi east of Remsen. Drainage area 12.9 mi^2.	1966-	07-08-03	88.78	(+)	03-22-79	94.87	(+)
Elliott Creek at Lawton, IA (06602190)	Lat 42°28'30", long 96°11'22", in NW1/4, sec.3, T.88 N., R.46 W. Woodbury County, Hydrologic Unit 10230004, at bridge on U.S. Highway 20, at west edge of Lawton. Drainage area 34.8 mi^2.	1966-	2003	(a)	<1,230	06-12-84	86.14	3,150
LITTLE SIOUX RIVER BASIN								
Ocheyedan River near Ocheyedan, IA (06604510)	Lat 43°25'58", long 95°36'41", in NE1/4, sec.6, T.99 N., R.40 W., Osceola County, Hydrologic Unit 10230003, at bridge on State Highway 9, 4 mi northwest of Ocheyedan. Drainage area 73.5 mi^2.	1966-	2003	(a)	<353	06-29-93	86.79	2,200
Dry Run Creek near Harris, IA (06604584)	Lat 43°26'42", long 95°27'21", in NE1/4, sec.33, T.100 N., R.39 W., Osceola County, Hydrologic Unit 10230003, at culvert on county highway M12, 1 mi west of Harris. Drainage area 4.30 mi^2.	1990-	03-17-03	11.14	30	06-29-93	16.44	419

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Prairie Creek near Spencer, IA (06605340)	Lat 43°05'16", long 95°09'40", in SE1/4, sec.36, T.96 N., R.37 W., Clay County, Hydrologic Unit 10230003, at bridge on U.S. Highway 71, 4 mi south of Spencer. Drainage area 22.3 mi^2.	1966-	06-26-03	88.50	152	07-04-71	90.77	2,200
						06-13-94	91.05	1,640
			Revised	Record:				
			06-15-85	88.24	260			
			04-24-86	89.52	783			
			1987	(a)	<150			
			1988	(a)	<144			
			1989	(a)	<139			
			1990	(a)	<134			
			04-14-91	88.24	269			
			07-26-92	89.68	671			
			08-31-93	90.68	1,420			
			06-13-94	91.05	1,640			
			08-05-95	87.46	135			
			1996	(a)	<99			
			03-19-97	88.97	298			
			1998	(a)	<68			
			06-06-99	88.05	166			
			2000	(a)	<63			
			05-07-01	89.86	474			
			2002	(a)	<58			
Willow Creek near Cornell, IA (06605750)	Lat 42°58'21", long 95°09'40", in SE1/4, sec.12, T.94 N., R.37 W., Clay County, Hydrologic Unit 10230003, at bridge on U.S. Highway 71, 2 mi northwest of Cornell. Drainage area 78.6 mi^2.	1966-	06-25-03	89.28	1,070	03-22-79	91.49	4,200
Little Sioux River tributary near Peterson, IA (06605868)	Lat 42°55'25", long 95°21'55", in NW1/4, sec.32, T.94 N., R.38 W., Clay County, Hydrologic Unit, 10230003, at culvert on State Highway 10, 1.2 mi northwest of Peterson. Drainage area 0.29 mi^2.	1991-	06-24-03	86.02	(+)	05-31-93	91.81	(+)
Willow Creek near Calumet, IA (06606231)	Lat 42°58'05", long 95°32'56" in NE1/4, sec. 15, T.94 N., R.40 W., O'Brian County, Hydrologic Unit 10230003, at culvert on State Highway 10, 1.2 mi north of Calumet. Drainage area 4.13 mi^2.	1991-	07-08-03	97.77	390[d]	07-14-93	100.92	[d]1,180
			Revised	Record:				
			1991	(a)	[d]<31			
			07-10-92	98.96	[d]580			
			07-14-93	100.92	[d]1,180			
			1994	97.68	(+)			
			05-08-95	(a)	[d]<32			
			03-31-96	(+)	(+)			
			03-19-97	(a)	[d]<34			
			03-30-98	95.24	(+)			
			06-06-99	(a)	[d]<34			
			2000	(a)	[d]<34			
			06-18-01	97.52	320			
			2002	(a)	[d]<34			
Halfway Creek at Schaller, IA (0660683710)	Lat 42°30'18", long 95°17'19", in SW1/4, sec.24, T.89 N., R.38 W., Sac County, Hydrologic Unit 10230005, at culvert on State Highway 110, 0.1 mi north of Schaller. Drainage area 1.74 mi^2.	1990-	07-09-03	93.06	(+)	07-14-92	94.11	(+)
BOYER RIVER BASIN								
Boyer River tributary at Woodbine, IA (06609482)	Lat 41°43'58", long 95°43'19", in SE1/4, sec.15, T.80 N., R.42 W., Harrison County, Hydrologic Unit 10230007, at culvert on county highway F32, 0.5 mi west of Woodbine. Drainage area 0.67 mi^2.	1990-2003	05-04-03	(+)	(+)	05-18-91	90.84	(+)
Willow Creek near Soldier, IA (06609560)	Lat 41°55'17", long 95°42'05", near S1/4 corner sec.11, T.82 N., R.42 W., Monona County, Hydrologic Unit 10230001, at bridge on State Highway 37, 6 mi southeast of Soldier. Drainage area 29.1 mi^2.	1966-	05-04-03	69.69	398	07-09-93	84.66	6,840

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
MOSQUITO CREEK BASIN								
Moser Creek near Earling, IA (06610510)	Lat 41°46'35", long 95°26'55", in NE1/4, sec.1, T.80 N., R.40 W., Shelby County, Hydrologic Unit 10230006, at bridge on State Highway 37, 1.5 mi west of Earling. Drainage area 21.6 mi^2.	1966-	05-04-03	76.75	2,020	06-15-84	87.89	(+)
Mosquito Creek tributary near Neola, IA (06610581)	Lat 41°30'06", long 95°35'44", in NE1/4, sec.6, T.77 N., R.41 W., Pottawattamie County, Hydrologic Unit 10230006, at culvert on State Highway 191, 3.8 mi north of Neola. Drainage area 3.22 mi^2.	1991-	07-09-03	79.28	[d]126	08-07-99	[d]82.7	[d]770
Keg Creek tributary near Mineola, IA (06805849)	Lat 41°07'53", long 95°43'31", in SW1/4, sec.7, T.73 N., R.42 W., Mills County, Hydrologic Unit 10240001, at culvert on county highway H12, 2.4 mi southwest of Mineola. Drainage area 2.01 mi^2.	1991-	05-05-03	76.11	[d]20	07-10-99	82.97	[d]600
NISHNABOTNA RIVER BASIN								
Elm Creek near Jacksonville, IA (0680737930)	Lat 41°38'44", long 95°12'18", in SW1/4, sec.18, T.79 N., R.37 W., Shelby County, Hydrologic Unit 10240002, at culvert on State Highway 44, 2.8 mi west of Jacksonville. Drainage area 9.43 mi^2.	1990-	2003	(a)	[d]<130	05-15-98	93.73	[d]1,220
Indian Creek near Emerson, IA (06807470)	Lat 41°01'50", long 95°22'51", in NW1/4, sec.19, T.72 N., R.39 W., Montgomery County, Hydrologic Unit 10240002, at bridge on U.S. State Highway 34, 1 mi east of Emerson. Drainage area 37.3 mi^2.	1966-	2003	(a)	<766	06-15-82 08-07-99	92.63 94.32	15,800 (+)
Bluegrass Creek at Audubon, IA (06808880)	Lat 41°42'46", long 94°44'46", in NW1/4, sec.28, T.80 N., R.35 W., Audubon County, Hydrologic Unit 10240003, at bridge on U.S. Highway 71, near south edge of Audubon. Drainage area 15.4 mi^2.	1966-	05-04-03	75.53	321	07-09-93	88.55	(+)
TARKIO RIVER BASIN								
Tarkio River near Elliott, IA (06811760)	Lat 41°06'06", long, 95°06'09", near NE corner sec.28, T.73 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, at bridge on county highway, 4.5 mi southeast of Elliott. Drainage area 10.7 mi^2.	1952-	2003	(a)	<374	08-29-93	12.98	4,640
East Tarkio Creek near Stanton, IA (06811800)	Lat 41°04'48", long 95°05'34", in W1/2 sec.34, T.73 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, at bridge on county highway H24, 7 mi north of Stanton. Drainage area 4.66 mi^2.	1952-	2003	(a)	<471	06-09-67	13.74	4,790
Tarkio River tributary near Stanton, IA (06811820)	Lat 41°02'38", long 95°05'55", in NE1/4 sec.16, T.72 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, at box culvert on county highway H63, 4 mi north of Stanton. Drainage area 0.67 mi^2.	1952-	05-09-03	93.24	(+)	06-23-99	5.56	1,070

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS—Continued

[+--not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 2003 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Snake Creek near Yorktown, IA (06811875)	Lat 40°44'33", long 95°07'46", in NW1/4, sec.32, T.69 N., R.37 W., Page County, Hydrologic Unit 10240005, at bridge on State Highway 2, 1.5 mi northeast of Yorktown. Drainage area 9.10 mi^2.	1966-1991 1997-	05-09-03	83.29	(+)	07-09-87	95.24	3,080
NODAWAY RIVER BASIN								
West Nodaway River at Massena, IA (06816290)	Lat 41°14'44", long 94°45'27", in SE1/4, sec.33, T.75 N., R.34 W., Cass County, Hydrologic Unit 10240009, at bridge on State Highway 148, at southeast corner of Massena. Drainage area 23.4 mi^2.	1966-	05-04-03	76.85	1,150	02-01-73	82.39	[d]4,700
PLATTE RIVER BASIN								
Platte River near Diagonal, IA (06818750)	Lat 40°46'02", long 94°24'46", in NW1/4, sec. 22, T.69 N., R.31 W., Ringgold County, Hydrologic Unit 10240012, at bridge on county highway, 2.2 mi upstream from Turkey Creek, 4.6 mi. southwest of Diagonal, and 4.9 mi downstream from Gard Creek. Drainage area 217 mi^2.	1968-1991 1997-	05-09-03	9.61	1,060	09-09-89	23.60	8,630
Middle Branch 102 River near Gravity, IA (06819110)	Lat 40°49'40", long 94°44'18", in SE1/4, sec.27, T.70 N., R.34 W., Taylor County, Hydrologic Unit 10240013, at bridge on State Highway 148, 4.8 mi north of Gravity. Drainage area 34.5 mi^2.	1966-	2003	(a)	<766	02-01-73 07-05-93	c83.65 82.30	(+) 6,250
GRAND RIVER BASIN								
Sevenmile Creek, near Thayer, IA (06897858)	Lat 41°01'37", long 94°00'03", in SE1/4, sec.18, T.72 N., R.27 W., Clarke County, Hydrologic Unit 10280102, at culvert on U.S. Highway 34, 2.6 mi east of Thayer. Drainage area 6.61 mi^2.	1991-	06-26-03	15.91	[d]370	09-15-92	24.92	[d]1,330
Elk Creek near Decatur City, IA (06897950)	Lat 40°43'18", long 93°56'12", in SE1/4, sec. 34, T.69 N., R.27 W., Decatur County, Hydrologic Unit 10280102, at bridge on county Highway, 1,000 ft. downstream from West Elk Creek, 5.8 mi. upstream from mouth, and 5.5 mi. (Revised) west of Decatur City. Drainage area 52.5 mi^2.	1968-	06-26-03	14.67	1,130	07-05-93	29.93	32,800

Index

Acid neutralizing capacity, definition of 17
Ackworth, South River near 316
Acre-foot, definition of 17
Adenosine triphosphate, definition of 17
Adjusted discharge, definition of 17
Akron, Big Sioux River at 364, 365
Algae,
  Blue-green, definition of 18
  Fire, definition of 21
  Green, definition of 22
Algal growth potential, definition of 17
Alkalinity, definition of 17
Alton, Floyd River at 372
Ames
  South Skunk River below Squaw Creek near 220
  South Skunk River near 216
  Squaw Creek at 218
Anamosa, Wapsipinicon River at 108
Annual runoff, definition of 17
Annual 7-day minimum, definition of 17
Aquifer
  Confined, definition of 19
  Unconfined, definition of 30
  Water-table, definition of 31
Aroclor, definition of 18
Artificial substrate, definition of 18
Ash mass, definition of 18
Aspect, definition of 18
Atlantic, East Nishnabotna River near 430
Augusta, Skunk River at 244

Bacteria, definition of 18
  Enterococcus, definition of 21
  Escherichia coli, definition of 21
  Fecal coliform, definition of 21
  Fecal streptococcal, definition of 21
  Total coliform, definition of 30
Bankfull stage, definition of 18
Base discharge, definition of 18
Base flow, definition of 18
Bayard, Middle Raccoon River near 288
Bear Creek at Ottumwa 462
Beaver Creek
  near Grimes 276
  at New Hartford 188
Beaver Slough at Third Street Clinton 88
Bed material, definition of 18
Bedford, East Fork One Hundred and Two River at 442
Bedload, definition of 18
Bedload discharge, definition of 18
Benthic organisms, definition of 18
Bettendorf, Crow Creek at 112
Big Bear Creek at Ladora 144
Big Creek near Mt. Pleasant 242
Big Sioux River at Akron 364, 365
Big Sioux River basin, crest-stage partial-record stations in . . 462
Big Whiskey Slough near Remsen 463
Biochemical oxygen demand, definition of 18
Biomass, definition of 18
Biomass pigment ratio, definition of 18
Black Hawk Creek
  at Hudson 192
Black Hawk Lake at Lake View 284
Bloody Run Creek near Marquette 44
Bloody Run tributary near Sherrill 457
Bloomfield, Fox River at 356
Bluegrass Creek at Audubon 465
Blue-green algae, definition of 18
Bluff Creek at Pilot Mound 461
Bluffton, Upper Iowa River at 38
Boone River near Webster City 262
Bottom material, definition of 18
Boyer River at Logan 402
Boyer River basin, crest-stage partial-record stations in . . 464
Boyer River tributary at Woodbine 464
Brewers Creek tributary near Webster City 461
Brushy Creek near Templeton 461
Bulger Run near Riverside 459
Bulk electrical conductivity, definition of 18
Burr Oak Creek near Perkins 462
Bush Branch Creek near Stanzel 462
Bussey, Cedar Creek near 350

Canadian Geodetic Vertical Datum 1928, definition of . . . 19
Cedar Creek
  near Bussey 350
  near Oakland Mills 240
Cedar Creek tributary No. 2 near Winterset 461
Cedar Falls, Cedar River at 190
Cedar Rapids, Cedar River at 198
Cedar River
  at Cedar Falls 190
  at Cedar Rapids 198
  at Charles City 172
  near Conesville 202
  at Janesville 178
  at Waterloo 194
  at Waverly 176
Cell volume, definition of 19
Cells/volume, definition of 19
Cfs-day, definition of 19
Channel bars, definition of 19
Chariton River
  near Chariton 446
  near Moulton 454
  near Rathbun 452
Charles City, Cedar River at 172

Chemical oxygen demand, definition of 19
Clarinda, Nodaway River at 438
Clayton
Mississippi River at 62
Clear Creek
near Coralville 158
near Oxford 156
Clear Creek tributary near Williamsburg 458
Clear Lake at Clear Lake 184
Clinton
Beaver Slough at Third Street 88
Mississippi River at 90
Clostridium perfringens, definition of 19
Colfax
South Skunk River at 232
Squaw Creek near 222
Coliphages, definition of 19
Color unit, definition of 19
Conductivity, definition of 28
Conesville, Cedar River near 202
Confined aquifer, definition of 19
Contents, definition of 19
Continuous-record station, definition of 19
Control, definition of 19
Control structure, definition of 19
Coralville
Clear Creek near 158
Coralville Lake near 148
Iowa River below Coralville Dam near 150
Correctionville, Little Sioux River at 392
Crest-stage stations, maximum stage and discharge, made at partial-record stations in 456
Crow Creek at Bettendorf 112
Cubic foot per second, definition of 19
Cubic foot per second-day, definition of 19
Cubic foot per second per square mile, definition of 20

Daily mean suspended-sediment concentration, definition of . 20
Daily record station, definition of 20
Dakota City, East Fork Des Moines River at 258
Dallas, White Breast Creek near 340
Data collection platform, definition of 20
Data logger, definition of 20
Datum, definition of 20
Davenport
Duck Creek at 110th Avenue 114
Duck Creek at Duck Creek Golf Course 116
Davis City, Thompson River at 444
Dawson Creek near Sibley 462
De Witt, Wapsipinicon River near 110
Decatur, Missouri River at 376
Decorah, Upper Iowa River at 40
Deep River at Deep River 459
Deer Creek near Carpenter 459
Des Moines
Des Moines River at Second Avenue at 278
Des Moines River below Raccoon River at 308
Fourmile Creek at 310
Raccoon River at 63rd Street 300
Raccoon River at Fleur Drive 304
Raccoon River near West Des Moines 298
Walnut Creek at 302
Des Moines River
below Raccoon River at Des Moines 308
at Second Avenue at Des Moines 278
at Fort Dodge 260
at Humboldt 256
at Keosauqua 354
at Ottumwa 352
near Pella 344
near Runnells 318
near Saylorville 268
near Stratford 264
near Tracy 348
Des Moines River basin, crest-stage partial-record stations in 461
Diatoms, definition of 20
Diel, definition of 20
Discharge, definition of 20
Dissolved, definition of 20
Dissolved oxygen, definition of 20
Dissolved solids concentration, definition of 20
Diversity index, definition of 20
Dorchester, Upper Iowa River near 42
Drainage area, definition of 20
Drainage basin, definition of 21
Drainage Ditch 97 tributary near Britt 461
Dry mass, definition of 21
Dry Run Creek near Decorah 456
Dry Run Creek near Harris 463
Dry weight, definition of 21
Duck Creek
at 110th Avenue, Davenport 114
at Duck Creek Golf Course Davenport 116
Dysart, Wolf Creek near 196

East Branch Iowa River above Mayfield 458
East Fork Des Moines River at Dakota City 258
East Fork One Hundred and Two River at Bedford 442
East Nishnabotna River
near Atlantic 430
at Red Oak 432
East Tarkio Creek near Stanton 465
Elberon, Salt Creek near 140
Eldorado, Turkey River near 66
Elk Creek near Decatur City 466
Elkader, Turkey River above French Hollow Creek at 68
Elliot Creek at Lawson 463
Elm Creek near Jacksonville 465
Embeddedness, definition of 21
English Creek near Knoxville 346

English River at Kalona 166
Enterococcus bacteria, definition of 21
EPT Index, definition of 21
Escherichia coli (E. coli), definition of 21
Estimated (E) value, definition of 21
Euglenoids, definition of 21
Extractable organic halides, definition of 21

Fecal coliform bacteria, definition of 21
Fecal streptococcal bacteria, definition of 21
Finchford, West Fork Cedar River at 180
Fire algae, definition of 21
Flow, definition of 20
Flow-duration percentiles, definition of 21
Floyd River
    at Alton 372
    at James 374
Floyd River basin, crest-stage partial-record stations in . . 462
Fort Dodge, Des Moines River at 260
Fourmile Creek at Des Moines 310
Fox River at Bloomfield 356
Fulton, North Fork Maquoketa River near 76

Gage datum, definition of 21
Gage height, definition of 22
Gage values, definition of 22
Gaging station, definition of 22
Garber, Turkey River at 72
Gas chromatography/flame ionization detector, definition of . 22
Geomorphic channel units, definition of 22
Grand River basin, crest-stage partial-record stations in . . 466
Green algae, definition of 22
Grimes, Beaver Creek near 276

Habitat, definition of 22
Habitat quality index, definition of 22
Haight Creek at Kingston 460
Halfway Creek at Schaller 464
Hamburg, Nishnabotna River above 434
Hancock, West Nishnabotna River at 426
Hardin Creek near Farlin 461
Hardness, definition of 22
Hartwick, Walnut Creek near 142
Haven, Richland Creek near 138
High tide, definition of 22
Hilsenhoff's Biotic Index, definition of 22
Honey Creek tributary near Radcliffe 458
Hoover Creek
    at West Branch 200
Horizontal datum, definition of 22
Hornick, West Fork Ditch at 378
Hudson, Black Hawk Creek at 192
Humboldt, Des Moines River at 256
hydrologic conditions, summary of
    precipitation 2
    surface water 3
    suspended sediment 3
Hydrologic index stations, definition of 22
Hydrologic unit, definition of 22

Inch, definition of 22
Independence, Wapsipinicon River at 106
Indian Creek near Emerson 465
Indian Creek near Mingo 234
Indianola, Middle River near 314
Instantaneous discharge, definition of 22
International Boundary Commission Survey Datum, definition of 22
Ionia, Little Cedar River near 174
Iowa City
    Iowa River at 160
    Old Mans Creek near 164
    Rapid Creek near 154
    South Branch Ralston Creek at 162
Iowa River
    below Coralville Dam near Coralville 150
    at Iowa City 160
    near Lone Tree 168
    at Marengo 146
    at Marshalltown 134
    near Rowan 120
    at Wapello 204
Iowa River basin, crest-stage partial-record stations in . . . 458
Island, definition of 23

James, Floyd River at 374
Janesville, Cedar River at 178
Jefferson, North Raccoon River near 286

Kalona, English River at 166
Keg Creek tributary near Mineola 465
Keigley Branch near Story City 460
Keokuk, Mississippi River at 252
Keosauqua, Des Moines River at 354
Knoxville, English Creek near 346

Laboratory reporting level, definition of 23
Ladora, Big Bear Creek at 144
Lake Panorama at Panora 290
Lake Red Rock near Pella 342
Lake View, Black Hawk Lake at 284
Lamont Creek tributary at Lamont 457
Land-surface datum, definition of 23
Latent heat flux, definition of 23
Light-attenuation coefficient, definition of 23
Linn Grove, Little Sioux River at 390
Lipid, definition of 23
Little Cedar River near Ionia 174
Little Floyd River near Sanborn 462

Little Maquoketa River
at Graf 456
Little Sioux River
at Correctionville 392
at Linn Grove 390
near Turin 396
Little Sioux River basin, crest-stage partial-record stations in . 463
Little Sioux River tributary near Peterson 464
Little Wapsipinicon River near Oran 457
Little Wapsipinicon River tributary near Riceville 457
Little White Breast Creek tributary near Chariton 462
Littleport, Volga River at 70
Logan, Boyer River at 402
Lone Tree, Iowa River near 168
Long Dick Creek near Ellsworth 460
Long-term method detection level, definition of 23
Low flow, 7-day, 10-year, definition of 27
Low tide, definition of 23

Macrophytes, definition of 23
Manchester, Maquoketa River at 74
Maple River at Mapleton 394
Mapleton, Maple River at 394
Maquoketa River at Manchester 74
Maquoketa River basin, crest-stage partial-record stations in . 456, ... 457
Maquoketa River near Maquoketa 78
Maquoketa, Maquoketa River near 78
Marengo, Iowa River at 146
Marquette, Bloody Run Creek near 44
Marshalltown
Iowa River at 134
Timber Creek near 136
Mason City, Winnebago River at 182
McGregor, Mississippi River at 54
Mean concentration of suspended sediment, definition of . 23
Mean discharge, definition of 23
Mean high tide, definition of 23
Mean low tide, definition of 23
Mean sea level, definition of 23
Measuring point, definition of 23
Megahertz, definition of 23
Membrane filter, definition of 23
Metamorphic stage, definition of 23
Method detection limit, definition of 24
Method of Cubatures, definition of 24
Methylene blue active substances, definition of 24
Micrograms per gram, definition of 24
Micrograms per kilogram, definition of 24
Micrograms per liter, definition of 24
Microsiemens per centimeter, definition of 24
Middle Branch 102 River near Gravity 466
Middle Creek near Lacey 460
Middle Fork Little Maquoketa River near Rickardsville . 457
Middle Raccoon River
near Bayard 288
at Panora 292
Middle River near Indianola 314
Milford, West Okoboji Lake at Lakeside Laboratory near 386
Miller Creek near Eagle Center 459
Milligrams per liter, definition of 24
Mingo, Indian Creek near 234
Minimum reporting level, definition of 24
Miscellaneous site, definition of 24
Mississippi River
at Clayton 62
at Clinton 90
at Keokuk 252
at McGregor 54
Mississippi River basin, crest-stage partial-record stations in . 456
Mississippi River tributary at McGregor 456
Missouri River
at Decatur 376
at Nebraska City 416
at Omaha 404
at Rulo 436
at Sioux City 368
Monona-Harrison Ditch basin, crest-stage partial-record stations in 463
Monona-Harrison Ditch near Turin 380
Morse, Rapid Creek below 152
Moser Creek near Earling 465
Mosquito Creek basin, crest-stage partial-record stations in . . 465
Mosquito Creek tributary near Neola 465
Most probable number, definition of 24
Moulton, Chariton River near 454
Mt. Pleasant, Big Creek near 242
Mud Lake drainage ditch 71 at Jewell 460
Multiple-plate samplers, definition of 24

Nanograms per liter, definition of 24
National Geodetic Vertical Datum of 1929, definition of . . 24
Natural substrate, definition of 24
Nebraska City, Missouri River at 416
Nekton, definition of 24
Nephelometric turbidity unit, definition of 24
New Hartford, Beaver Creek at 188
New Providence, South Fork Iowa River Northeast of . . . 126
Nishnabotna River above Hamburg 434
Nishnabotna River basin, crest-stage partial-record stations in 465
Nodaway River at Clarinda 438
Nodaway River basin, crest-stage partial-record stations in . . 466
North American Datum of 1927, definition of 24
North American Datum of 1983, definition of 24
North American Vertical Datum of 1988, definition of . . . 25
North English River
at Guernsey 459

near Montezuma 459
North Fork Little Maquoketa River near Rickardsville . . . 457
North Fork Long Creek at Ainsworth 460
North Fork Maquoketa River near Fulton 76
North Fork tributary to Mill Creek near Solon 458
North Raccoon River
near Jefferson 286
near Sac City 282
North River near Norwalk 312
North Skunk River near Sigourney 238
Norwalk, North River near 312

Oakland Mills, Cedar Creek near 240
Ocheyedan River
near Ocheyedan 463
Ocheyedan River near Spencer 388
Old Mans Creek near Iowa City 164
Omaha, Missouri River at 404
Open interval, definition of 25
Organic carbon, definition of 25
Organic mass, definition of 25
Organism count,
Area, definition of 25
Total, definition of 30
Volume, definition of 25
Organochlorine compounds, definition of 25
Orleans, Spirit Lake near 384
Oskaloosa, South Skunk River near 236
Ottumwa, Des Moines River at 352
Oxford, Clear Creek near 156

Panora
Lake Panorama at 290
Middle Raccoon River at 292
Parameter code, definition of 25
Partial-record station, definition of 25
Partial-record stations and miscellaneous discharges at . . 456
Particle size, definition of 25
Particle-size classification, definition of 25
Peak flow, definition of 25
Peak stage, definition of 25
Peas Creek at Boone 461
Peas Creek tributary at Boone 461
Pella
Des Moines River near 344
Lake Red Rock near 342
Percent composition, definition of 25
Percent of total, definition of 25
Percent shading, definition of 26
Periodic-record station, definition of 26
Periphyton, definition of 26
Perry Creek
near Hinton 462
near Merrill 462
Perry Creek at 38th Street Sioux City 370
Perry Creek basin, crest-stage partial-record stations in . . 462
Pesticides, definition of 26
pH, definition of 26
Phytoplankton, definition of 26
Picocurie, definition of 26
Pine Creek tributary near Winthrop 457, 458
Pine Creek tributary No. 2 at Winthrop 458
Pisgah, Soldier River at 398
Plankton, definition of 26
Platte River basin, crest-stage partial-record stations in . . 466
Polychlorinated biphenyls, definition of 26
Polychlorinated naphthalenes, definition of 26
Pool, definition of 26
Prairie City, Walnut Creek near 320
Prairie Creek near Spencer 464
Prairie Creek tributary near Van Horne 459
Price Creek at Amana 458
Primary productivity, definition of 26
Carbon method, definition of 26
Oxygen method, definition of 26
Promise City, South Fork Chariton River near 448

Raccoon River
at 63rd Street Des Moines 300
at Fleur Drive Des Moines 304
at Van Meter 296
near West Des Moines 298
Radioisotopes, definition of 26
Randolph, West Nishnabotna River at 428
Rapid Creek
below Morse 152
Rapid Creek near Iowa City 154
Rathbun
Chariton River near 452
Rathbun Lake near 450
Rathbun Lake near Rathbun 450
Reach, definition of 27
Recoverable from bed (bottom) material, definition of 27
Recurrence interval, definition of 27
Red Oak, East Nishnabotna River at 432
Redfield, South Raccoon River at 294
Replicate samples, definition of 27
Return period, definition of 27
Richland Creek near Haven 138
Riffle, definition of 27
River mileage, definition of 27
Rock Rapids, Rock River below Tom Creek at 360
Rock River below Tom Creek at Rock Rapids 360
Rock River near Rock Valley 362
Rock Valley, Rock River near 362
Rowan, Iowa River near 120
Rulo, Missouri River at 436
Run, definition of 27
Runnells, Des Moines River near 318
Runoff, definition of 27

Sac City, North Raccoon River near 282
Salt Creek near Elberon 140
Sand Creek near Manchester 457
Saylorville
  Des Moines River near 268
  Saylorville Lake near 266
Screened interval, definition of 25
Sea level, definition of 27
Sediment, definition of 27
Sensible heat flux, definition of 27
Seven-day, 10-year low flow, definition of 27
Sevenmile Creek near Thayer 466
Shell Rock River at Shell Rock 186
Shelves, definition of 28
Sigourney, North Skunk River near 238
Silver Creek
  at Welton 458
Sioux City
  Missouri River at 368
  Perry Creek at 38th Street 370
Skunk River at Augusta 244
Skunk River basin, crest-stage partial-record stations in . 460
Skunk River tributary near Richland 460
Snipe Creek tributary at Melbourne 460
Sodium adsorption ratio, definition of 28
Soil heat flux, definition of 28
Soil-water content, definition of 28
Soldier River at Pisgah 398
South Avery Creek near Blakesburg 462
South Branch Ralston Creek at Iowa City 162
South Fork Chariton River near Promise City 448
South Fork Iowa River Northeast of New Providence . . . 126
South Raccoon River at Redfield 294
South River near Ackworth 316
South Skunk River
  near Ames 216
  at Colfax 232
  near Oskaloosa 236
  below Squaw Creek near Ames 220
Specific electrical conductance (conductivity), definition of . . 28
Spencer, Ocheyedan River near 388
Spirit Lake near Orleans 384
Spring Creek near Mason City 459
Squaw Creek
  at Ames 218
  near Colfax 222
Stable isotope ratio, definition of 28
Stage, definition of 28
Stage-discharge relation, definition of 28
Stein Creek near Clutier 458
Stratford, Des Moines River near 264
Streamflow, definition of 28
Substrate, definition of 28
  Artificial, definition of 18
  Natural, definition of 24
Substrate embeddedness class, definition of 28
Surface area of a lake, definition of 28
Surficial bed material, definition of 28
Surrogate, definition of 28
Suspended, definition of 28
  Recoverable, definition of 28
  Total, definition of 29
Suspended sediment, definition of 28
Suspended-sediment concentration, definition of 29
Suspended-sediment discharge, definition of 29
Suspended-sediment load, definition of 29
Suspended solids, total residue at 105 °C concentration, definition of 29
Sweeney Creek tributary near Sheldon 463
Synoptic studies, definition of 29

Tarkio River basin, crest-stage partial-record stations in . 465
Tarkio River near Elliott 465
Tarkio River tributary near Stanton 465, 466
Taxa (Species) richness, definition of 29
Taxonomy, definition of 29
Thalweg, definition of 29
Thermograph, definition of 29
Thompson River at Davis City 444
Thunder Creek at Blairstown 460
Timber Creek near Marshalltown 136
Time-weighted average, definition of 29
Tons per acre-foot, definition of 29
Tons per day, definition of 29
Total, definition of 29
Total coliform bacteria, definition of 30
Total discharge, definition of 30
Total in bottom material, definition of 30
Total length, definition of 30
Total load, definition of 30
Total organism count, definition of 30
Total recoverable, definition of 30
Total sediment discharge, definition of 30
Total sediment load, definition of 30
Tracy, Des Moines River near 348
Transect, definition of 30
Tripoli, Wapsipinicon River near 98
Turbidity, definition of 30
Turin
  Little Sioux River near 396
  Monona-Harrison Ditch near 380
Turkey River above French Hollow Creek at Elkader 68
Turkey River at Garber 72
Turkey River basin, crest-stage partial-record stations in . 456
Turkey River near Eldorado 66

Ultraviolet (UV) absorbance (absorption), definition of . . . 30
Unconfined aquifer, definition of 30
Upper Iowa River at Bluffton 38

Upper Iowa River at Decorah 40
Upper Iowa River basin, crest-stage partial-record stations in 456
Upper Iowa River near Dorchester 42

Van Meter, Raccoon River at 296
Vandalia, Walnut Creek near 330
Vertical datum, definition of 31
Volatile mass, definition of 25
Volatile organic compounds, definition of 31
Volga River at Littleport 70

Walnut Creek
    at Des Moines 302
    near Hartwick 142
    near Prairie City 320
    near Vandalia 330
Wapello, Iowa River at 204
Wapsipinicon River
    at Anamosa 108
    near De Witt 110
    at Independence 106
Wapsipinicon River basin, crest-stage partial-record stations in 457
Wapsipinicon River near Tripoli 98
Water table, definition of 31
Water-table aquifer, definition of 31
Water year, definition of 31
Waterloo Creek near Dorchester 456
Waterloo, Cedar River at 194
Watershed, definition of 31
Waverly, Cedar River at 176
WDR, definition of 31
Webster City, Boone River near 262
Weighted average, definition of 31
West Branch, Hoover Creek at 200
West Floyd Branch near Struble 463
West Fork Cedar River at Finchford 180
West Fork Ditch at Hornick 378
West Nishnabotna River
    at Hancock 426
    at Randolph 428
West Nodaway River at Massena 466
West Okoboji Lake at Lakeside Laboratory near Milford . 386
Westmain drainage ditch 1 & 2 at Britt 458
Wet mass, definition of 31
Wet weight, definition of 31
White Breast Creek near Dallas 340
White Fox Creek at Clarion 461
Williams Creek near Charlotte 457
Willow Creek
    near Calumet 464
    near Cornell 464
    near Soldier 464
Willow Creek near Mason City 459
Winnebago River at Mason City 182
Wolf Creek near Dysart 196
WSP, definition of 31

Zooplankton, definition of 31

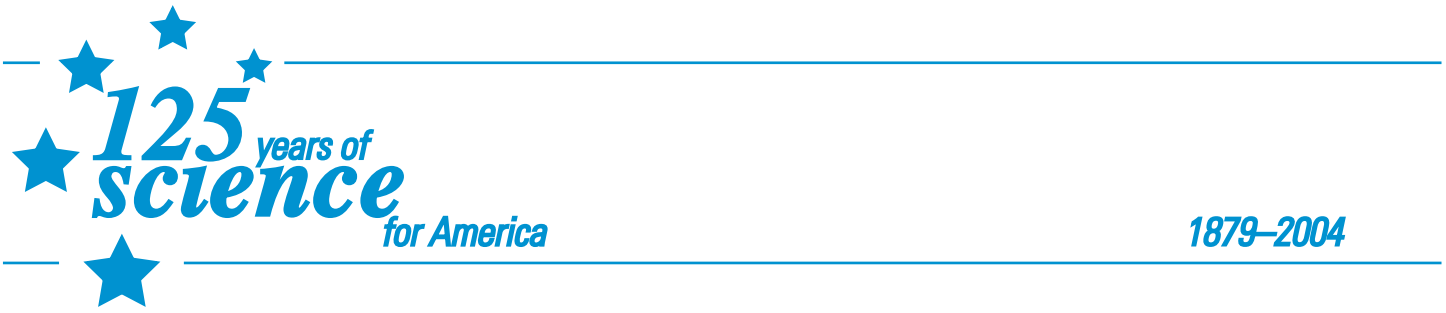
Conversion Factors

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter (mm)
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter (m)
mile (mi)	1.609×10^{0}	kilometer (km)
	Area	
acre	4.047×10^{3}	square meter (m^2)
	4.047×10^{-1}	square hectometer (hm^2)
	4.047×10^{-3}	square kilometer (km^2)
square mile (mi^2)	2.590×10^{0}	square kilometer (km^2)
	Volume	
gallon (gal)	3.785×10^{0}	liter (L)
	3.785×10^{-3}	cubic meter (m^3)
	3.785×10^{0}	cubic decimeter (dm^3)
million gallons (Mgal)	3.785×10^{3}	cubic meter (m^3)
	3.785×10^{-3}	cubic hectometer (hm^3)
cubic foot (ft^3)	2.832×10^{-2}	cubic meter (m^3)
	2.832×10^{1}	cubic decimeter (dm^3)
cubic-foot-per-second-per-day [(ft^3/s/d]	2.447×10^{3}	cubic meter (m^3)
	2.447×10^{-3}	cubic hectometer (hm^3)
acre-foot (acre-ft)	1.223×10^{3}	cubic meter (m^3)
	1.223×10^{-3}	cubic hectometer (hm^3)
	1.223×10^{-6}	cubic kilometer (km^3)
	Flow rate	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter (L/s)
	2.832×10^{-2}	cubic meter per second (m^3/s)
	2.832×10^{1}	cubic decimeter per second (dm^3/s)
gallon per minute (gal/min)	6.309×10^{-2}	liter per second (L/s)
	6.309×10^{-5}	cubic meter per second (m^3/s)
	6.309×10^{-2}	cubic decimeter per second (dm^3/s)
million gallons per day (Mgal/d)	4.381×10^{-2}	cubic meter per second
	4.381×10^{1}	cubic decimeter per second (dm^3/s)
	Mass	
ton, short (2,000 lb)	9.072×10^{-1}	megagram (Mg) or metric ton

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8 \times °C) + 32$$

USGS



Printed on recycled paper