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UNITED STATES DEPARTMENT OF THE INTERIOR

SURFACE WATER SUPPLY
of the **UNITED STATES**
1933

PART 6
MISSOURI RIVER BASIN

Prepared in cooperation with the States of
KANSAS, MISSOURI, MONTANA, NEBRASKA, NORTH DAKOTA
AND WYOMING

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 746

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UNITED STATES DEPARTMENT OF THE INTERIOR

HAROLD L. ICKES, Secretary

GEOLOGICAL SURVEY

W. C. MENDENHALL, Director

Water-Supply Paper 746

SURFACE WATER SUPPLY *of the* UNITED STATES 1933

PART 6

MISSOURI RIVER BASIN

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Prepared in cooperation with the States of
KANSAS, MISSOURI, MONTANA, NEBRASKA
NORTH DAKOTA, and WYOMING



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ILLUSTRATION

FIGURE 1. Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

SURFACE WATER SUPPLY OF MISSOURI RIVER BASIN, 1933

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1933.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat.L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895-1934

1895-----	\$12, 500. 00	1911-17---	\$150, 000. 00	1928-----	\$147, 000. 00
1896-----	24, 500. 00	1918-----	175, 000. 00	1929-----	270, 500. 00
1897-99---	50, 000. 00	1919-----	148, 244. 10	1930-----	275, 000. 00
1900-----	70, 000. 00	1920-----	175, 000. 00	1931-----	565, 000. 00
1901-2----	100, 000. 00	1920-23---	180, 000. 00	1932-----	711, 000. 00
1903-6----	200, 000. 00	1924-25---	170, 000. 00	1933-----	600, 000. 00
1907-----	150, 000. 00	1926-----	165, 000. 00	1934-----	¹ 540, 000. 00
1908-10---	100, 000. 00	1927-----	151, 000. 00		

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

¹ Only \$340,000 available for expenditure.

Measurements of stream flow have been made at about 6,680 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July 1933, 2,800 gaging stations were being maintained by the Geological Survey and the cooperating organizations. Many miscellaneous discharge measurements were made at other points. In connection with this work, data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS

The volume of water flowing in a stream—the “run-off” or “discharge”—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miner’s inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, and acre-feet. They may be defined as follows:

“Second-feet” is an abbreviation for “cubic feet per second.” A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

“Second-feet per square mile” is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

“Run-off in inches” is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in inches.

An “acre-foot”, equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined:

“Stage-discharge relation”, an abbreviation for the term “relation of gage height to discharge.”

“Control”, a term used to designate the natural section or stretch of the channel or artificial structure below the gage which determines the stage-discharge relation at the gage.

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1932, and ending September 30, 1933. At the beginning of January in most parts of the United States much of the precipitation in the preceding 3 months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as underground water, and this stored water passes off in the streams during the spring break-up. At the end of

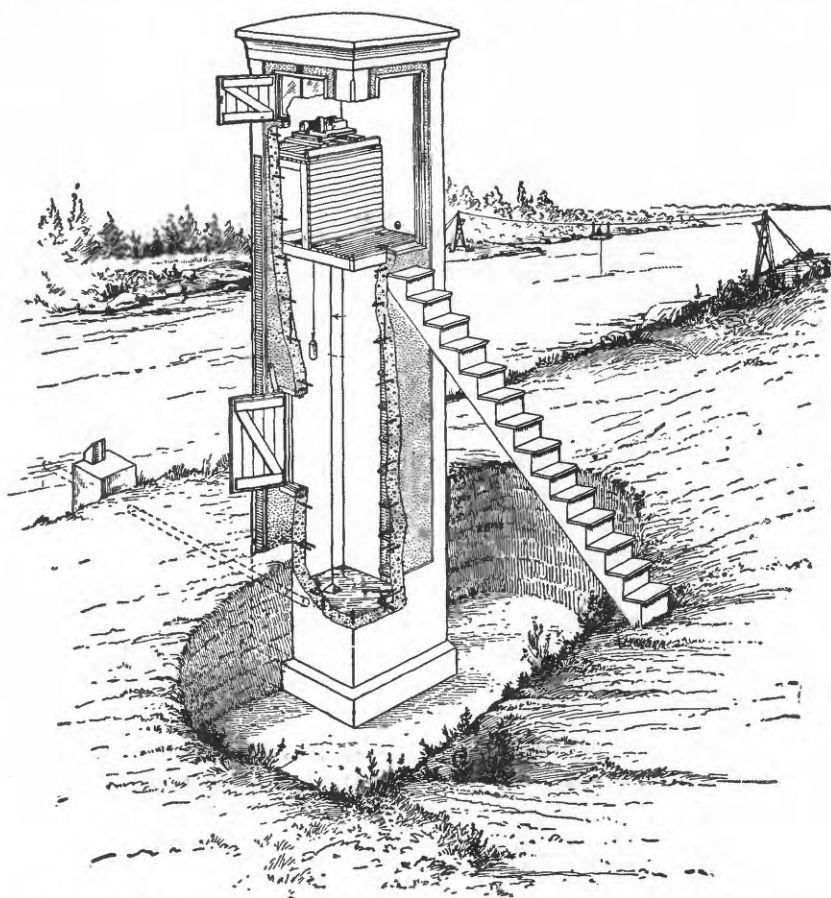


FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in deter-

mining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage, or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard text books on the measurement of river discharge. A typical gaging station, equipped with water-stage recorder and measuring cable and car, is shown in figure 1.

Rating tables giving the discharge for any stage are prepared from the discharge measurements. The application of the daily gage height to these rating tables give the daily discharge from which the monthly and yearly mean discharge is computed.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

The description of the station gives information in regard to the location and type of gage, diversions that decrease the flow at the gage, artificial regulation from pondage or storage, and the accuracy of the records. Information under "Discharge" gives the maximum and minimum recorded discharges and the average discharge. The maximum does not necessarily represent the crest discharge unless a water-stage recorder was in operation or a nonrecording gage was read at the time of the crest. Likewise, the minimum may not represent the lowest discharge. The average discharge is the average of the mean annual discharges for the years indicated. It is given only for stations for which there are 10 or more complete years of record.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the daily gage height, which may be a once-daily reading or the mean of twice-daily readings of a nonrecording gage, or the mean daily gage height obtained from a water-stage recorder graph.

At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders, the mean daily discharge may be obtained by averaging discharge for intervals of the day or by using the discharge integrator, an instrument for obtaining mean daily discharge from a continuous gage-height graph and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the maximum daily discharge and not the discharge when the water surface was at crest height. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" is the average flow in cubic feet per

second during the month. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanency of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

The station description gives a statement in regard to the general accuracy of the records. "Excellent" indicates that, in general, the daily records are accurate within 5 percent; "good," within 10 percent; "fair," within 15 percent; and "poor," within 20 percent or more.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches.

The table of monthly discharge gives a general idea of the flow at the station. The table of daily discharge allows more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must first be satisfied.

PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigations of such closely allied subjects as irrigation water storage, water power, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the bulletins, professional papers, monographs, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with the natural drainage features as indicated below:

- Part 1. North Atlantic slope basins (St. John River to York River).
 2. South Atlantic slope and eastern Gulf of Mexico basins (James River to Mississippi River).
 3. Ohio River Basin.
 4. St. Lawrence River Basin.
 5. Hudson River and upper Mississippi River Basins.
 6. Missouri River Basin.
 7. Lower Mississippi River Basin.
 8. Western Gulf of Mexico basins.
 9. Colorado River Basin.
 10. The Great Basin.
 11. Pacific slope basins in California.
 12. North Pacific slope basins, in three parts:
 A. Pacific slope basins in Washington and upper Columbia River Basin.
 B. Snake River Basin.
 C. Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D.C., who will, on application, furnish lists giving prices.
2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.
3. Sets are available for consultation in the local offices of the water-resources branch of the Geological Survey as follows:

Augusta, Maine, Statehouse.
 Boston, Mass., 945 Post Office Building.
 Hartford, Conn., 203 Federal Building.
 Albany, N.Y., 353 Broadway.
 Trenton, N.J., 228 Federal Building.
 Harrisburg, Pa., 492 Education Building.
 Charlottesville, Va., University of Virginia.
 South Charleston, W.Va., Naval Ordnance Plant.
 Asheville, N.C., 220 Post Office Building.
 Columbia, S.C., 801 National Loan & Exchange Bank Building.
 Ocala, Fla., Post Office Building.
 Montgomery, Ala., Post Office Building.
 Chattanooga, Tenn., 217 Post Office Building.
 Columbus, Ohio, Engineering Experiment Station, Ohio State University.
 Indianapolis, Ind., 319 Federal Building.
 Urbana, Ill., 302 University New Agricultural Building.
 Madison, Wis., 337N State Capitol.
 St. Paul, Minn., 808 New Post Office Building.
 Iowa City, Iowa, 402 Hydraulic Laboratory, University of Iowa.
 St. Louis, Mo., 3 Customhouse.

Rolla, Mo., Missouri Geological Survey Building, Missouri School of Mines and Metallurgy.

Topeka, Kans., 305 Federal Building.

Fort Smith, Ark., Post Office Building.

Austin, Tex., State Highway Building.

Santa Fe, N.Mex., State Capitol.

Tucson, Ariz., 210 Post Office Building.

Denver, Colo., 403 Post Office Building.

Salt Lake City, Utah, 303 Federal Building.

Idaho Falls, Idaho, 228 Federal Building.

Boise, Idaho, 429 Federal Building.

Helena, Mont., 421 Federal Building.

Tacoma, Wash., 406 Federal Building.

Portland, Oreg., 606 Post Office Building.

San Francisco, Calif., 303 Customhouse.

Los Angeles, Calif., 510 Eighth and Figueroa Building.

Honolulu, Hawaii, 225 Federal Building.

A list of Geological Survey publications may be obtained by applying to the Director, United States Geological Survey, Washington, D.C.

Stream-flow records have been obtained at about 6,680 points in the United States, and the data obtained have been published in the reports tabulated as follows:

Stream-flow data in reports of the United States Geological Survey

[A = Annual Report; B = Bulletin; W = Water-Supply Paper]

Report	Character of data	Year
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to Sept. 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 3	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893-94.
16th A, pt. 2	Descriptive information only	1895.
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	
W 11	Gage heights (also heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895-96.
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas River.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte Rivers, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 33 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905.
W 201 to 214	do	1906.
W 241 to 252	do	1907-8.
W 261 to 272	do	1909.

Stream-flow data in reports of the United States Geological Survey—Continued

Report	Character of data	Year
W 281 to 292.....	Complete data.....	1910.
W 301 to 312.....	do.....	1911.
W 321 to 332.....	do.....	1912.
W 351 to 362.....	do.....	1913.
W 381 to 394.....	do.....	1914.
W 401 to 414.....	do.....	1915.
W 431 to 444.....	do.....	1916.
W 451 to 464.....	do.....	1917.
W 471 to 484.....	do.....	1918.
W 501 to 514.....	do.....	1919-20.
W 521 to 534.....	do.....	1921.
W 541 to 554.....	do.....	1922.
W 561 to 574.....	do.....	1923.
W 581 to 594.....	do.....	1924.
W 601 to 614.....	do.....	1925.
W 621 to 634.....	do.....	1926.
W 641 to 654.....	do.....	1927.
W 661 to 674.....	do.....	1928.
W 681 to 694.....	do.....	1929.
W 696 to 709.....	do.....	1930.
W 711 to 724.....	do.....	1931.
W 726 to 739.....	do.....	1932.
W 741 to 754.....	do.....	1933.

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year and are published under "Miscellaneous discharge measurements" at the end of each report in the same relative order as the regular gaging stations. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1933. The data for any particular station will, as a rule, be found in the reports covering the years during which the station was maintained. For example, data from 1910 to 1920 for any station in the area covered by part 3 are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

Numbers of water-supply papers containing results of stream measurements, 1899-1933

[For basins included see p. 6]

Year	1	2	3	4	5	6	7	8	9	10	11	12-A	12-B	12-C
1899 ^a	35	35, 36	36	36	36	e 36, 37	37	37	d 37, 38	38, f 39	38, f 39	38	38	38
1900 ^a	47, A 48	48	48, i 49	49	49	49, j 50	50	50	50	51	51	51	51	51
1901.....	65, 75	65, 75	65, 75	65, 75	65, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902.....	82, 83	82, 83	82, 83	82, 83	82, 83	83	83	83	83	85	85	85	85	85
1903.....	97	97, 98	97	97	97	98	98	98	98	100	100	100	100	100
1904.....	124, c 125, p 126	p 126, 127	128	129	129	130, e 131	131	132	133	133, r 134	134	135	135	135
1905.....	165, e 166, p 167	p 167, 168	169	170	171	172	173	174	175, i 177	176, j 177	177	178	178	178
1906.....	201, c 202, p 203	p 203, 204	205	206	207	208	209	210	211, i 213	212, r 213	213	214	214	214
1907.....	241	242	243	244	245	246	247	248	249	250, r 251	251	252	252	252
1908.....	261	262	263	264	265	266	267	268	269	270, r 271	271	272	272	272
1909.....	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1910.....	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1911.....	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1912.....	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1913.....	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1914.....	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1915.....	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1916.....	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1917.....	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1918.....	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1919-20.....	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1921.....	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1922.....	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1923.....	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1924.....	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1925.....	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1926.....	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1927.....	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1928.....	681	682	683	684	685	686	687	688	689	690	691	692	693	694
1929.....	696	697	698	699	700	701	702	703	704	705	706	707	708	709
1930.....	711	712	713	714	715	716	717	718	719	720	721	722	723	724
1931.....	726	727	728	729	730	731	732	733	734	735	736	737	738	739
1932.....	741	742	743	744	745	746	747	748	749	750	751	752	753	754

^a Rating tables and index to Water-Supply Papers 35-39 contained in Water-Supply Paper 39. Monthly discharge for 1899 in Twenty-first Annual Report, pt. 4.
^b James River only.
^c Gallatin River.
^d Green and Gunnison Rivers and Colorado River above Gunnison River.
^e Mohave River only.
^f Kings and Kern Rivers and south Pacific slope basins.
^g Rating tables and index to Water-Supply Papers 47-52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Tables of monthly discharge for 1900 in Twenty-second Annual Report, pt. 4.
^h Wissahickon and Schuylkill Rivers to James River.
ⁱ Scioto River.
^j Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte River.
^k Tributaries of Mississippi River from east.
^l Lake Ontario and tributaries to St. Lawrence River proper.
^m Hudson Bay only.
ⁿ New England rivers only.
^o Hudson River to Delaware River, inclusive.
^p Susquehanna River to Yackin River, inclusive.
^q Platte and Kansas Rivers.
^r The Great Basin in California, except Truckee and Carson River Basins.
^s Below junction with Gila River.
^t Rogue, Umpqua, and Siletz Rivers only.

COOPERATION

The work in the several States was done under cooperative agreements as follows: In Kansas with the Water Resources Division of the State Board of Agriculture, George S. Knapp, chief engineer; in Missouri with the Missouri Bureau of Geology and Mines, H. A. Buehler, State geologist, and the State Game and Fish Department, J. A. Ross and W. C. Buford, commissioners; in Montana until June 30, 1933, with the State engineer, J. S. James; in Nebraska with the State engineer, through R. H. Willis, chief, Bureau of Irrigation, Water Power, and Drainage; in North Dakota with the State engineer, Robert E. Kennedy; and in Wyoming with the State engineers, John A. Whiting, J. B. True, and E. W. Burritt successively.

Acknowledgment of financial assistance in collecting records published herein is due also to the Corps of Engineers, United States Army, and the United States Department of State.

Full cooperation exists between the United States Geological Survey and the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada. On waters adjacent to the international boundary certain stations are maintained jointly by the United States and Canada under the terms of the Boundary Waters Treaty of 1909, and others are maintained under a subsequent agreement between the two Governments. The records from all these stations are obtained in such a manner as to be equally acceptable and available in either country. These stations are herein designated "international gaging stations."

Assistance in collecting records was also rendered by the following municipalities, organizations, and corporations: In Colorado by M. C. Hinderlider, State engineer, and the city of Denver; in Missouri by the Union Electric Light & Power Co., the Gasconade River Power Co., and the Missouri Electric Power Co.; in Montana by the Liberty-Montana Mines Co.; in Nebraska by the Omaha Metropolitan Utilities.

DIVISION OF WORK

The data for the stations in the several States were collected and prepared for publication as follows: In Colorado, Iowa (except Nishnabotna River above Hamburg) Nebraska (except Missouri River at Nebraska City), South Dakota, Wyoming, and for the station on the Tongue River near Decker, Mont., by Robert Follanbee, district engineer, assisted by J. H. Baily, F. F. LeFever, H. P. Eisenhuth, L. F. Hanks, M. C. Boyer, S. C. Moore, F. M. Roush, A. W. Hall, A. E. Johnston, Earl Lloyd, C. A. Gaensslen, F. B. Shaffer, Miss Nellie L. Esterly, and Mrs. Elsie L. Yeatman; in Kansas by J. B. Spiegel, district engineer, assisted by Charles Wells, Joseph A. Sterling, Henry P. Rolfe, R. V. Smrha, H. Gerald Bobst, Emilie Langsdorf, and Mrs.

Maude Moon; in Missouri and for the stations on the Missouri River at Nebraska City, Nebr., and the Nishnabotna River above Hamburg, Iowa, by H. C. Beckman, district engineer, assisted by H. C. Bolon, R. D. Schmickle, C. J. Eyeberg, C. H. Jennings, W. M. Littlefield, and F. M. Bell; in Montana and North Dakota (except Madison River near West Yellowstone, Mont.) by W. A. Lamb, district engineer, assisted by A. H. Tuttle, C. S. Heidel, Edward Post, E. H. Bekkedahl, H. C. Smith, and Mrs. G. Thompson; and in Yellowstone National Park and for the station on Madison River near West Yellowstone, Mont., by Thomas R. Newell, district engineer, assisted by J. A. Allis, L. R. Sawyer, J. R. Throckmorton, E. G. Bailey, H. C. Eagle, J. G. Han-num, Miss E. H. Haugse, Mrs. Josephine Bailey, and Miss Doris C. Randall.

The records were reviewed and manuscript assembled by Trigg Twichell.

GAGING-STATION RECORDS

MISSOURI RIVER PROPER

RED ROCK RIVER BELOW RED ROCK RESERVOIR, NEAR MONIDA, MONT.

LOCATION.—Staff gage in SW¼ sec. 32, T. 13 S., R. 6 W., just below Red Rock Reservoir and 8 miles northwest of Monida.

DRAINAGE AREA.—560 square miles.

RECORDS AVAILABLE.—July 1911 to September 1918; May 1925 to September 1933.

DISCHARGE.—Maximum during year (estimated), 2,500 second-feet May 15 (gage height, 5.40 feet); minimum, 1 second-foot Aug. 16–22 (gage height, 0.02 foot).

1911–18, 1925–33: Maximum, that of May 15, 1933; minimum, 0.6 second-foot Sept. 27, 1931 (gage height, 0.01 foot).

REMARKS.—Records good. No records Jan. 1 to Feb. 28. Storage released May 11 to 22 on account of leaks in dam. Flood water stored in reservoir and released as required. Small irrigation diversions from tributaries above.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	40	136	15	13	15	37	311	59	6	5.
2.....	40	109	15	13	15	37	311	55	6	5
3.....	40	94	15	13	15	37	311	52	6	6
4.....	40	69	15	14	15	40	293	50	6	6
5.....	40	43	15	15	15	40	275	49	5	6.
6.....	40	43	15	15	15	40	275	48	4	4
7.....	40	43	15	15	15	43	275	42	4	4
8.....	40	43	15	15	15	43	275	37	5	4
9.....	40	21	15	15	15	43	275	37	6	4
10.....	43	21	15	15	8	46	275	37	4	4
11.....	44	19	15	15	3	* 883	258	35	4	4
12.....	46	15	15	15	3	* 1,220	275	33	4	4
13.....	46	15	15	15	3	* 1,500	275	32	3	4
14.....	49	15	15	15	4	* 2,400	275	31	3	4
15.....	49	15	15	15	4	* 2,500	311	30	3	4
16.....	49	15	15	15	3	* 2,000	369	26	2	4
17.....	49	15	15	15	3	* 1,800	475	22	1	5
18.....	49	15	15	15	3	* 1,750	589	20	1	6
19.....	49	15	15	15	3	* 600	612	18	1	6
20.....	49	15	15	15	3	* 600	566	16	1	6
21.....	49	15	15	15	3	* 550	311	14	1	7
22.....	48	15	15	15	3	* 400	113	13	2	8
23.....	52	15	15	15	3	* 364	103	13	4	9
24.....	52	15	15	15	15	* 359	92	12	4	9
25.....	52	15	15	17	32	349	82	12	4	11
26.....	50	17	15	17	32	349	75	10	3	13
27.....	55	15	15	15	32	349	71	10	3	13
28.....	96	15	15	15	35	330	66	9	4	14
29.....	96	15	15	15	35	330	62	9	4	15
30.....	113	15	15	15	35	330	60	8	4	16
31.....	138		15	15		311		7	4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	138	40	54.0	3,320
November.....	136	15	30.9	1,840
December.....	15	15	15.0	922
March.....	17	13	14.9	916
April.....	35	3	13.3	791
May.....	2,500	37	635	39,000
June.....	612	60	264	15,700
July.....	59	7	27.3	1,680
August.....	6	1	3.6	221
September.....	16	4	7.0	417

* Dam upstream leaking badly and stored water released, discharge estimated.

BEAVERHEAD RIVER AT BARRATTS, MONT.

LOCATION.—Chain gage in SE¼SW¼ sec. 20, T. 8 S., R. 9 W., 1 mile above Barratts and 10 miles southwest of Dillon.

DRAINAGE AREA.—2,850 square miles.

RECORDS AVAILABLE.—August 1907 to August 1933.

DISCHARGE.—Maximum during year, 1,300 second-feet May 18 (gage height, 2.87 feet); minimum, 102 second-feet Dec. 8 (gage height, 0.35 foot).

1907-33: Maximum, 3,640 second-feet June 19, 20, 1908 (gage height, 6.0 feet); minimum, that of Dec. 8, 1932.

REMARKS.—Records good. Numerous diversions above station. Regulation caused by storage and release of flood waters of Red Rock River near Monida, Mont.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	124	226	294	159	184	212	294	249	294	170	121
2	126	226	294	159	198	204	294	249	294	143	124
3	128	219	274	198	198	204	294	274	294	143	124
4	131	253	274	198	204	204	294	274	406	143	128
5	133	253	274	219	204	204	294	274	530	138	128
6	140	253	274	219	204	198	274	274	605	138	117
7	143	253	337	219	165	198	274	212	680	138	117
8	145	253	102	219	159	204	249	212	680	143	117
9	177	253	104	204	159	204	242	212	680	143	117
10	177	249	124	204	153	204	242	190	605	143	117
11	177	249	138	204	133	208	242	190	605	143	117
12	190	249	140	212	133	204	234	171	605	143	113
13	190	249	140	212	133	204	234	274	505	128	-----
14	190	249	156	212	138	204	219	530	505	128	-----
15	190	249	156	212	138	212	219	730	505	128	-----
16	190	274	150	212	159	212	242	950	505	128	-----
17	190	274	171	198	171	234	242	1,180	360	128	-----
18	212	316	184	198	177	234	242	1,240	337	128	-----
19	212	316	184	184	184	226	242	1,240	316	128	-----
20	208	316	198	184	184	226	226	630	274	124	-----
21	204	316	249	190	184	226	226	455	253	124	-----
22	204	316	198	190	184	212	226	430	212	124	-----
23	204	316	194	190	204	212	234	382	198	124	-----
24	204	316	215	165	190	219	226	360	177	121	-----
25	253	316	219	198	190	219	226	316	171	121	-----
26	253	274	219	234	190	219	204	294	143	124	-----
27	253	274	215	171	204	219	204	274	143	121	-----
28	253	274	208	198	204	226	204	274	133	121	-----
29	253	316	208	190	-----	294	212	274	198	121	-----
30	253	316	215	190	-----	294	226	274	198	121	-----
31	226	-----	162	184	-----	294	-----	274	-----	121	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	253	124	191	11,700
November	316	219	274	16,300
December	337	102	202	12,400
January	234	159	197	12,100
February	204	133	176	9,780
March	294	198	220	13,500
April	294	204	243	14,500
May	1,240	171	425	26,100
June	680	133	380	22,600
July	170	121	132	8,120
August 1-12	128	113	120	2,860
The period	-----	-----	-----	150,000

JEFFERSON RIVER NEAR SILVERSTAR, MONT.

LOCATION.—Cable gage in SE¼ sec. 23, T. 2 S., R. 6 W., at highway bridge 5 miles southwest of Silverstar and 5 miles below junction of Featherhead and Big Hole Rivers.

DRAINAGE AREA.—7,840 square miles.

RECORDS AVAILABLE.—August 1910 to September 1916; July 1920 to September 1933.

DISCHARGE.—Maximum during year, 8,850 second-feet June 5, 6, 11 (gage height, 6.0 feet); minimum, 106 second-feet Aug. 18 and 20 (gage height, 1.17 feet). 1910-16, 1920-33: Maximum, 19,800 second-feet June 15, 1927 (gage height, 9.85 feet); minimum, 55 second-feet Sept. 10 and 14, 1931 (gage height, 0.87 foot).

REMARKS.—Records good. No record Dec. 7 to Mar. 31. Numerous diversions. Flow partly regulated by the operation of two reservoirs.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	532	1,060	1,230	955	3,080	3,750	2,460	170	406
2	474	1,060	1,170	955	3,080	6,200	2,260	174	456
3	503	1,060	1,170	955	2,560	6,700	1,800	182	503
4	512	1,060	1,230	1,060	2,560	7,750	1,720	224	373
5	532	1,060	1,170	1,060	2,360	8,850	1,490	198	282
6	532	1,060	1,170	1,060	2,160	8,850	1,420	198	272
7	550	1,120		1,170	2,070	8,290	1,360	206	272
8	610	1,170		1,230	2,070	8,290	2,460	214	282
9	655	1,120		1,170	1,720	7,750	1,230	198	282
10	805	1,230		1,170	1,640	8,290	1,230	190	304
11	805	1,230		1,060	1,720	8,850	1,120	190	250
12	855	1,170		1,060	1,420	8,290	1,010	182	242
13	905	1,120		1,010	1,360	8,290	1,010	174	232
14	855	1,290		1,010	1,640	8,290	755	174	224
15	805	1,290		955	1,360	8,020	755	154	214
16	855	1,170		1,120	1,720	7,750	705	130	224
17	955	1,230		1,120	1,980	7,220	655	115	304
18	1,010	1,290		1,890	2,260	6,700	608	106	317
19	1,010	1,360		1,890	2,870	6,700	570	115	331
20	1,010	1,360		1,890	2,870	5,700	496	106	317
21	1,010	1,290		1,890	2,870	4,210	422	160	338
22	1,010	1,290		1,890	2,360	3,300	422	242	338
23	955	1,230		1,890	2,560	3,300	331	272	331
24	955	1,170		3,080	2,560	2,870	317	282	317
25	1,010	1,290		3,080	2,660	2,360	304	260	331
26	955	1,120		3,080	2,560	2,360	282	294	345
27	1,010	1,230		3,300	2,870	1,800	272	406	422
28	1,010	1,230		3,300	2,870	1,640	242	440	440
29	1,010	1,230		3,080	3,300	2,560	232	474	440
30	1,060	1,230		3,080	3,300	2,460	206	440	456
31	1,010				3,520		190	422	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,060	474	831	51,100
November	1,360	1,060	1,190	70,800
December 1-6	1,230	1,170	1,190	14,200
April	3,300	955	1,720	102,000
May	3,520	1,360	2,380	146,000
June	8,850	1,640	5,910	352,000
July	2,460	190	914	56,200
August	474	106	229	14,100
September	503	214	328	19,500

MISSOURI RIVER BELOW HAUSER LAKE DAM, NEAR HELENA, MONT.

LOCATION.—Water-stage recorder in SW¼ sec. 29, T. 12 N., R. 2 W., at Hauser Lake power plant, 15 miles northeast of Helena.

DRAINAGE AREA.—16,600 square miles.

RECORDS AVAILABLE.—December 1922 to September 1933.

DISCHARGE.—Maximum during year, 12,700 second-feet June 20 (gage height 73.20 feet); minimum, 440 second-feet Sept. 10 (gage height, 65.75 feet).

1922-33: Maximum, 33,300 second-feet June 14, 15, 18, 1927 (gage height, 78.80 feet); minimum, 440 second-feet Sept. 10, 1033 (gage height, 65.75 feet).

REMARKS.—Records good. Numerous diversions. Flow partly regulated by operation of reservoirs and power plants above station. Records furnished by Montana Power Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,980	3,090	3,090	2,660	3,260	2,980	4,150	6,530	6,020	3,180	1,410	840
2	2,450	3,170	3,730	2,870	3,330	3,200	3,840	6,830	7,740	2,180	1,760	880
3	2,530	3,140	3,240	3,120	3,180	3,180	3,680	6,000	11,000	2,400	1,760	880
4	2,950	3,140	2,980	3,050	3,120	3,220	3,770	5,590	10,800	4,070	2,400	570
5	2,920	3,000	3,600	3,070	2,950	3,010	3,680	5,540	11,000	3,880	2,350	1,330
6	2,820	3,140	4,180	3,110	3,380	3,340	4,400	5,330	11,700	3,480	1,980	2,210
7	2,900	3,090	3,640	3,140	3,500	4,090	3,600	3,650	12,700	3,200	2,200	2,320
8	2,920	3,010	3,510	2,360	3,330	4,130	4,580	4,370	11,700	2,960	2,160	1,940
9	2,800	3,090	3,000	2,600	3,220	4,130	6,160	5,040	11,000	2,780	2,160	1,300
10	2,850	3,060	2,920	3,070	3,090	3,960	6,500	4,730	11,400	2,780	2,440	440
11	2,880	3,090	3,060	3,150	3,030	4,000	6,080	4,880	10,700	2,700	2,830	500
12	2,870	3,250	3,140	3,240	3,010	4,540	5,700	4,320	11,500	2,780	2,870	720
13	2,880	2,850	3,140	3,240	2,980	4,660	5,500	3,820	12,100	2,180	2,530	1,560
14	2,870	2,980	3,030	3,420	2,960	5,920	4,170	3,300	12,400	2,520	1,780	2,230
15	3,000	3,120	3,060	3,360	2,880	5,430	3,650	3,790	12,300	1,680	1,620	2,220
16	1,600	3,640	3,090	3,960	2,900	5,250	3,070	3,860	11,900	1,700	1,590	1,960
17	2,010	4,530	3,140	3,860	3,010	5,100	3,410	3,720	12,000	2,760	2,240	1,940
18	3,050	4,690	2,870	3,200	3,030	5,250	3,500	3,700	11,300	2,780	2,880	1,540
19	3,120	5,040	2,890	3,170	2,830	4,580	3,560	4,000	11,000	2,400	1,820	1,820
20	3,170	4,910	2,890	3,140	2,920	4,840	3,730	4,600	10,200	2,150	1,140	2,150
21	2,780	4,790	3,060	3,090	3,060	4,730	3,980	4,740	7,940	2,740	970	2,350
22	2,880	4,730	3,060	2,880	3,050	4,460	4,320	4,890	4,340	2,870	860	2,110
23	2,060	4,650	3,150	3,010	4,600	4,280	2,880	4,810	5,770	2,960	1,440	2,060
24	2,440	4,540	3,090	3,120	3,060	4,250	2,770	4,830	5,880	2,820	1,910	1,160
25	2,870	4,090	2,670	3,140	3,110	4,130	3,300	5,000	4,660	2,160	2,380	2,150
26	3,090	4,360	2,440	3,140	2,760	3,380	3,310	5,880	3,780	1,040	2,300	1,920
27	3,170	3,520	2,780	3,150	2,580	3,740	3,600	6,160	2,890	680	1,440	1,620
28	2,870	3,720	3,050	3,170	2,600	3,960	4,150	5,980	3,360	1,510	1,870	1,620
29	3,060	3,330	3,070	2,900	-----	4,120	5,370	6,240	3,790	2,380	2,380	2,090
30	2,620	2,890	3,050	3,090	-----	4,050	6,100	6,850	3,090	1,320	2,080	2,320
31	2,800	-----	3,120	3,300	-----	4,100	-----	6,170	-----	790	1,420	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3,170	1,600	2,780	171,000
November	5,040	2,850	3,660	218,000
December	4,180	2,440	3,120	192,000
January	3,960	2,360	3,120	192,000
February	4,600	2,580	3,100	172,000
March	5,920	2,980	4,190	258,000
April	6,500	2,770	4,220	251,000
May	6,850	3,300	5,000	307,000
June	12,700	2,890	8,890	529,000
July	4,070	680	2,450	151,000
August	2,880	860	1,970	121,000
September	2,350	440	1,620	96,400
The year	12,700	440	3,670	2,660,000

MISSOURI RIVER AT FORT BENTON, MONT.

LOCATION.—Water-stage recorder in NE¼ sec. 26, T. 24 N., R. 8 E., at highway bridge at Fort Benton.

DRAINAGE AREA.—24,600 square miles.

RECORDS AVAILABLE.—July 1881 to November 1891; July 1902 to September 1933. Prior to 1918 open water season only.

DISCHARGE.—Maximum recorded during year ending Sept. 30, 1932, 23,500 second-feet June 13 (gage height, 5.95 feet); minimum, 895 second-feet Jan. 16 (gage height, 0.05 foot).

Maximum recorded during year ending Sept. 30, 1933, 26,200 second-feet June 10 (gage height, 6.49 feet); minimum, 1,180 second-feet Mar. 15 (gage height, 0.25 foot).

1881-91, 1902-33: Maximum, about 140,000 second-feet (revised) June 7, 1908 (gage height, 18.5 feet, present datum); minimum, that of Jan. 16, 1932.

REMARKS.—Records good except those for periods of ice effect, Nov. 26 to Dec. 4, Dec. 9-18, 1931, Jan. 30 to Feb. 25, Mar. 9-15, 1932, Dec. 1, 1932, to Mar. 2, 1933, which are poor. Numerous diversions from tributaries. Flow partly regulated by storage in reservoirs.

Discharge, in second-feet, 1931-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1-----	2,330	2,960	2,500	1,580	2,500	6,060	4,860	6,740	8,360	12,100	3,620	2,880
2-----	2,700	2,580		1,770		6,740	4,720	5,900	9,470	10,900	4,030	2,880
3-----	2,330	2,330	3,760	1,880	2,200	7,460	5,150	5,900	7,820	8,540	3,760	2,880
4-----	2,960	3,090		1,180		5,740	6,060	5,900	5,440	7,460	4,160	2,880
5-----	2,960	4,580		1,330		4,580	7,100	5,900	5,590	7,460	4,300	2,880
6-----	3,360	2,100	2,700	1,180	2,200	2,930	7,100	6,400	6,230	6,570	4,030	2,880
7-----	2,830	5,300	3,490	1,330		1,980	7,820	5,900	8,000	4,720	4,030	2,880
8-----	2,330	3,090	3,760	1,330	2,400	7,640	5,900	9,090	4,160	3,760	2,880	
9-----	4,860	2,960		1,250		7,820	6,400	11,700	4,030	4,030	2,910	
10-----	3,620	2,960		1,330		8,180	6,570	15,900	4,440	3,900	2,910	
11-----	3,360	3,090		1,410	2,500		8,000	6,570	19,600	3,900	3,900	3,040
12-----	1,980	2,700		1,330			7,100	7,100	21,800	5,150	4,030	2,960
13-----	2,210	2,580	2,500	1,330	2,400		6,230	8,360	21,800	4,860	4,440	2,930
14-----	2,700	2,400		1,030			5,590	8,900	20,800	4,160	4,720	2,930
15-----	3,090	2,830		1,030			5,300	10,100	19,100	4,150	4,720	2,830
16-----	2,960	2,700		895	2,500	5,440	4,860	14,400	17,400	4,300	2,930	4,160
17-----	3,090	3,220		2,450		7,460	5,000	15,400	19,100	4,030	3,090	4,160
18-----	2,700	2,960		2,450	2,500	6,740	5,000	16,400	20,200	4,300	3,900	3,760
19-----	2,960	3,620	960	5,150		4,860	5,000	16,400	20,800	4,300	3,760	3,490
20-----	2,960	3,090	2,210	4,860		6,400	5,440	15,400	21,800	4,160	2,730	4,720
21-----	3,360	2,960	2,450	5,150	2,200	7,820	5,740	15,400	22,400	4,160	5,400	4,440
22-----	3,360	2,560	2,210	5,150		4,580	6,570	15,900	20,800	4,440	6,920	4,300
23-----	3,360	2,170	2,450	4,860	2,200	4,860	7,100	16,900	20,200	4,030	10,500	5,000
24-----	2,960	1,770	1,980	3,760		4,860	8,000	17,400	19,600	4,160	6,460	4,720
25-----	2,700	1,680	1,980	3,220		5,440	8,540	16,400	18,600	4,160	3,760	4,480
26-----	2,700		2,210	3,490	2,580	6,400	8,900	15,400	16,900	3,900	3,010	1,680
27-----	3,220		1,980	2,210	3,460	6,060	8,900	14,900	14,900	4,030	3,330	4,720
28-----	3,490	2,500	1,770	1,980	4,720	6,400	8,360	13,900	14,900	4,300	3,120	4,860
29-----	3,220		1,770	1,770	5,440	6,400	7,640	13,000	13,900	4,580	2,930	4,300
30-----	2,700		2,450	3,000		6,400	7,280	11,700	12,100	4,580	2,960	4,580
31-----	3,490		2,700	3,000		5,300		10,500		4,860	2,910	

NOTE.—Records Oct. 1, 1931 to Sept. 30, 1932, supersede those published in Water-Supply Paper 731.

Discharge, in second-feet, of Missouri River at Fort Benton, Mont., 1931-33—Con.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1.....	3,920	3,670				5,000	5,600	11,400	16,900	6,730	2,450	3,670
2.....	4,050	3,670					5,450	9,640	19,600	6,730	2,190	3,500
3.....	4,440	3,540				4,710	5,600	9,640	20,200	6,400	2,330	3,500
4.....	4,440	3,540				4,180	5,760	10,200	21,400	5,760	2,280	2,810
5.....	4,180	3,800				4,440	5,910	11,400	23,200	5,450	2,330	3,300
6.....	4,440	3,800				4,710	5,910	10,600	24,400	5,600	2,400	3,120
7.....	4,580	3,420				4,710	6,230	10,600	24,400	5,910	2,400	2,570
8.....	5,450	3,540				4,710	6,230	10,200	23,200	6,070	2,330	2,880
9.....	4,860	3,800				4,710	5,300	9,640	23,800	5,450	2,380	3,340
10.....	3,540	3,540				4,710	6,230	9,260	23,800	5,450	2,230	3,420
11.....	5,000	3,670				5,000	6,400	9,640	24,400	5,150	2,280	4,050
12.....	4,710	3,670				4,710	6,560	9,640	23,800	5,150	2,570	3,670
13.....	5,150	3,800				4,440	6,560	9,640	21,400	3,670	2,310	3,270
14.....	5,910	3,540				5,910	6,230	9,260	21,400	4,440	1,690	2,930
15.....	5,300	3,030			3,750	6,560	6,900	8,140	22,600	4,440	2,260	3,000
16.....	2,620	4,180	3,000	3,500		7,310	6,560	8,700	23,800	4,440	2,690	2,910
17.....	3,100	2,830				8,700	6,900	10,200	23,800	4,310	2,790	2,570
18.....	4,440	6,230				7,600	6,900	11,800	23,200	4,180	2,980	2,590
19.....	3,150	5,150				7,420	5,910	12,200	22,600	5,150	2,140	3,200
20.....	3,070	4,050				7,080	5,910	12,700	20,800	5,000	2,500	3,170
21.....	3,240	3,420				7,080	5,910	11,000	19,000	4,310	2,880	2,690
22.....	3,540	4,440				6,560	5,910	11,000	17,400	4,310	4,580	2,500
23.....	3,800	4,310				5,910	5,910	11,000	13,600	2,210	6,400	3,100
24.....	3,670	5,000				5,760	6,230	12,200	9,070	2,330	5,760	2,880
25.....	3,540	4,180				5,450	6,900	12,200	7,600	3,800	4,860	2,620
26.....	3,420	4,710				5,600	6,560	11,800	7,600	2,810	3,540	3,000
27.....	3,320	5,300				5,760	6,230	12,700	6,900	3,420	6,230	3,120
28.....	3,420	5,000				5,600	6,900	16,400	6,400	3,070	5,760	2,930
29.....	3,540	4,710				5,300	7,080	16,400	6,400	3,240	5,150	3,300
30.....	3,670	3,920				5,450	8,520	15,400	6,900	2,380	4,440	3,370
31.....	3,540					5,450		15,400		2,470	3,540	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October.....	4,860	1,980	3,000	184,000
November.....	5,300	1,680	2,830	168,000
December.....	3,760	960	2,450	151,000
January.....	5,150	895	2,380	146,000
February.....	5,440		2,590	149,000
March.....	7,820	1,980	4,860	299,000
April.....	8,900	4,720	6,700	399,000
May.....	17,400	5,900	11,000	676,000
June.....	22,400	5,440	15,500	922,000
July.....	12,100	3,900	5,190	319,000
August.....	10,500	2,730	4,170	256,000
September.....	5,000	1,680	3,560	212,000
The year.....	22,400	895	5,350	3,880,000
1932-33				
October.....	5,910	2,620	4,030	248,000
November.....	6,230	2,830	4,050	241,000
December.....			3,000	184,000
January.....			3,500	215,000
February.....			3,750	208,000
March.....	8,700	4,180	5,660	348,000
April.....	8,520	5,300	6,310	375,000
May.....	16,400	8,140	11,300	695,000
June.....	24,400	6,400	15,300	1,090,000
July.....	6,730	2,210	4,510	277,000
August.....	6,400	1,690	3,250	200,000
September.....	4,050	2,500	3,120	186,000
The year.....	24,400	1,690	5,890	4,270,000

NOTE.—Daily and monthly figures for Oct. 1, 1931, to Sept. 30, 1932, supersede those published in Water-Supply Paper 731.

MISSOURI RIVER NEAR WOLF POINT, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 28, T. 27 N., R. 48 E., at highway bridge 6 miles southeast of Wolf Point. Prior to June 4 chain gage at same location with same datum.

DRAINAGE AREA.—82,400 square miles.

RECORDS AVAILABLE.—April 1930 to September 1933; September 1928 to April 1930 comparable record at ferry crossing at Wolf Point, 6 miles upstream.

DISCHARGE.—Maximum discharge during year, 29,800 second-feet June 10; maximum gage height, 12.30 feet Mar. 25, during ice period; minimum, not determined, probably occurred during ice period.

1928-33: Maximum, 41,000 second-feet May 23, 1932; maximum stage, 17.45 feet Mar. 30, 1930; minimum, 1,700 second-feet Nov. 23, 1931.

REMARKS.—Records good except those for period of ice effect, Nov. 12 to Mar. 28, which are fair. Numerous diversions from tributaries. Flow partly regulated by storage reservoirs above power plants.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3,800	3,980					9,150	9,420	19,200	10,900	3,980	9,420
2.....	3,630	3,890					8,620	10,000	19,800	10,300	3,890	8,620
3.....	3,800	3,800					8,370	10,000	20,300	9,420	3,980	7,900
4.....	4,160	3,800					8,130	10,300	20,800	9,710	3,800	7,020
5.....	4,350	3,800					7,900	12,900	23,000	10,000	3,800	6,380
6.....	3,980	3,800					7,680	15,800	26,100	9,420	3,380	5,750
7.....	4,350	3,980					7,460	14,700	27,500	9,420	3,300	5,350
8.....	4,350	4,070					7,460	16,200	28,000	9,420	3,380	5,150
9.....	4,350	4,160					7,460	17,800	29,400	11,900	3,220	4,950
10.....	3,980	4,160					7,680	19,900	29,800	10,600	3,300	4,260
11.....	4,160	4,160					7,680	18,200	28,900	8,370	3,300	4,160
12.....	4,350						7,460	17,000	28,400	8,130	3,300	4,070
13.....	4,750						7,460	15,800	28,000	8,130	3,300	3,980
14.....	4,750						7,240	15,100	27,500	7,680	3,220	3,630
15.....	4,550						7,020	15,100	28,000	7,020	3,220	3,800
16.....	4,550	3,830	2,300	3,940	3,770	6,190	7,240	15,500	27,100	6,800	3,150	4,260
17.....	4,550						7,460	14,700	25,700	6,380	3,080	4,260
18.....	4,950						7,680	14,400	24,800	6,170	3,000	4,350
19.....	5,150						7,680	14,000	25,700	5,350	3,150	3,980
20.....	5,350						7,680	12,600	26,600	5,350	2,920	3,800
21.....	4,950						7,680	14,000	26,600	5,350	2,640	3,720
22.....	4,550						7,900	17,400	27,500	5,150	3,150	3,630
23.....	4,450						7,900	20,300	27,500	4,950	4,160	3,630
24.....	4,350						7,680	24,300	25,200	4,950	4,650	3,580
25.....	3,980						7,680	22,100	24,300	5,350	6,590	3,460
26.....	3,980	3,550	3,880	2,520	5,130	11,100	7,460	17,000	21,700	5,350	12,900	3,720
27.....	3,980						7,460	17,000	17,400	4,850	14,700	3,460
28.....	3,980						7,460	17,400	14,700	4,750	15,800	3,300
29.....	3,980						18,200	17,800	12,900	3,890	15,500	3,300
30.....	4,160						9,710	18,200	11,900	3,460	14,000	3,460
31.....	3,980						8,620	18,700		3,720	11,500	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	5,350	3,630	4,330	266,000
November.....	4,160		3,790	226,000
December.....			3,250	200,000
January.....			3,690	227,000
February.....			3,840	213,000
March.....	18,200		8,480	521,000
April.....	9,150	7,020	7,730	460,000
May.....	24,300	9,420	15,900	978,000
June.....	29,800	11,900	24,100	1,430,000
July.....	11,900	3,460	7,170	441,000
August.....	15,800	2,640	5,590	344,000
September.....	9,420	3,300	4,670	278,000
The year.....	29,800		7,720	5,580,000

* Interpolated.

MISSOURI RIVER NEAR WILLISTON, N.DAK.

LOCATION.—Water-stage recorder in sec. 31, T. 154 N., R. 101 W., at Lewis & Clark Highway bridge 7 miles west of Williston.

RECORDS AVAILABLE.—September 1928 to September 1933.

DISCHARGE.—Maximum during year, 92,400 second-feet June 21; maximum gage height, 11.94 feet Mar. 16, during period of ice effect; minimum not determined.

1928-33: Maximum, 231,000 second-feet Apr. 4, 1930 (gage height, 18.0 feet); minimum, 3,340 second-feet Dec. 3, 1931.

Maximum stage recorded, 18.6 feet, while ice was breaking Apr. 4, 1930; minimum stage, 0.38 foot Sept. 18, 1931.

REMARKS.—Records good except those for periods of ice effect, Nov. 11 to Mar. 27, which are fair. Numerous diversions above station. Several storage reservoirs on tributary streams.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10,700	9,930					17,800	20,900	45,100	39,600	9,320	31,500
2	10,700	9,930					16,800	20,900	43,800	38,300	8,940	30,500
3	10,700	9,550					18,200	22,100	50,600	35,900	8,940	26,000
4	10,700	9,550					18,800	25,500	60,000	34,800	8,940	21,000
5	9,930	9,550					18,800	27,800	69,400	32,600	8,580	18,700
6	9,550	9,550	9,650	8,690	7,560	18,000	18,200	27,800	69,400	31,500	8,400	17,600
7	9,930	9,170					17,800	28,600	76,200	31,500	8,230	16,600
8	9,930	9,170					17,800	29,500	79,600	29,500	8,230	15,200
9	9,930	9,360					17,800	32,300	79,600	29,500	8,060	13,900
10	10,300	9,360					16,800	37,600	81,300	30,500	8,230	13,000
11	10,300	9,550					16,400	37,600	79,600	27,700	9,520	12,600
12	10,300						15,900	35,400	74,500	26,800	9,520	11,400
13	10,700						16,400	34,300	72,800	23,700	9,320	10,500
14	11,100						16,400	32,300	77,900	22,300	8,940	10,500
15	11,100						16,400	30,400	81,300	21,600	8,580	10,100
16	11,100	8,220	4,460	7,640	6,010	29,600	15,900	30,400	83,000	20,400	8,230	9,710
17	11,100						15,900	31,300	83,900	19,200	8,060	10,100
18	11,100						15,500	32,300	86,000	17,600	7,890	10,500
19	11,100						15,500	32,300	83,900	16,600	7,720	10,100
20	11,100						15,900	32,300	86,000	16,100	7,230	10,500
21	11,100						15,900	31,300	88,100	15,200	7,400	10,900
22	11,500						16,400	29,500	86,000	14,300	7,560	10,900
23	11,900						16,800	30,400	79,700	14,300	7,560	9,910
24	11,900						18,200	37,600	75,600	13,500	7,560	9,710
25	12,700				7,900	23,000	19,300	58,100	73,600	13,000	8,060	9,910
26	13,100	9,570	6,030	6,730			18,800	52,000	66,000	12,600	9,320	9,520
27	13,500						17,800	47,800	60,600	12,200	10,900	9,320
28	11,900						17,800	42,500	55,500	12,600	17,600	9,320
29	11,500						36,500	18,800	40,000	49,200	21,600	9,520
30	10,700						27,000	19,800	38,800	43,500	10,900	9,320
31	10,300						24,800		43,800		9,910	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13,500	9,930	11,000	676,000
November			9,140	544,000
December			6,690	411,000
January			7,660	471,000
February			7,100	394,000
March	44,600		24,800	1,520,000
April	19,800	15,500	17,300	1,030,000
May	58,100	20,900	34,000	2,090,000
June	88,100	43,500	71,400	4,250,000
July	39,600	9,910	22,100	1,360,000
August	30,500	7,230	10,400	640,000
September	31,500	9,320	13,600	809,000
The year	88,100		19,600	14,200,000

^a Interpolated.

MISSOURI RIVER AT BISMARCK, N.DAK.

LOCATION.—Water-stage recorder in sec. 31, T. 139 N., R. 80 W., at Bismarck city water plant.

DRAINAGE AREA.—187,000 square miles.

RECORDS AVAILABLE.—September 1904 to December 1905; October 1927 to September 1933.

DISCHARGE.—Maximum during year, 88,800 second-feet June 21; maximum gage height, 9.53 feet Mar. 21, during period of ice effect; minimum, 3,820 second-feet Dec. 28.

1904-5, 1928-33: Maximum, 201,000 second-feet Mar. 24, 1928 (gage height, 13.2 feet); maximum gage height, 17.8 feet Mar. 27, 1929, during ice gorge; minimum, 3,690 second-feet Dec. 10, 1931; minimum gage height, 1.93 feet Sept. 15, 1931.

REMARKS.—Records good except those for period of ice effect, Nov. 8 to Mar. 30, which are fair. Numerous diversions above station. Several storage reservoirs on tributaries.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1....	10,800	14,500	12,000	6,860	7,100	7,840	57,000	18,000	46,200	52,100	12,000	17,100
2....	11,000	13,600	13,200	7,590	6,860	9,240	37,600	18,500	48,500	45,100	12,000	30,900
3....	11,000	13,200	13,600	7,840	6,860	10,600	22,000	19,600	48,500	39,700	11,300	38,600
4....	11,000	12,000	13,200	7,840	7,100	11,000	19,600	20,800	48,500	38,600	10,600	34,600
5....	10,600	11,300	13,200	8,360	7,340	12,000	19,000	21,400	52,100	36,600	10,000	29,800
6....	11,000	11,000	12,800	8,930	8,100	12,800	20,200	22,700	64,700	35,600	9,710	24,100
7....	11,300	11,000	12,400	9,240	8,640	13,600	19,600	27,200	71,200	34,600	9,420	21,400
8....	11,300	10,200	11,700	9,240	8,640	14,900	19,000	32,600	75,200	31,700	9,420	19,600
9....	11,000	9,240	10,600	9,240	8,640	15,300	18,500	31,700	76,500	31,700	9,140	18,000
10....	10,600	8,930	9,240	8,930	8,640	16,100	18,000	34,600	76,500	30,800	9,140	16,900
11....	10,600	8,640	8,100	8,930	8,640	18,500	16,900	36,600	76,500	28,900	8,860	16,000
12....	10,600	8,640	7,340	8,930	8,640	19,500	16,900	42,900	75,200	27,200	8,590	15,100
13....	10,600	8,360	7,340	8,640	8,640	21,600	16,900	40,700	72,600	27,200	8,590	13,900
14....	10,600	8,100	7,840	8,360	8,640	23,300	16,000	37,600	69,900	26,400	8,590	12,700
15....	10,600	7,840	7,840	7,840	8,360	23,900	15,600	37,600	71,200	25,600	8,860	12,400
16....	10,600	7,840	7,840	7,340	8,360	25,800	15,600	35,600	76,500	23,400	9,140	12,400
17....	10,600	8,100	7,340	6,630	8,360	28,800	16,000	35,600	81,900	22,000	9,140	11,600
18....	10,600	8,360	6,410	6,860	7,840	32,300	16,000	34,600	83,300	21,400	8,860	11,300
19....	11,700	8,100	5,810	7,100	7,590	35,400	16,000	35,600	84,700	20,200	8,590	11,000
20....	11,300	8,100	5,300	7,590	7,100	43,000	15,100	37,600	86,000	19,000	8,590	10,600
21....	11,700	7,840	4,980	8,100	6,630	50,300	15,100	39,700	88,800	18,000	8,320	10,300
22....	12,000	7,840	4,680	8,360	6,200	43,000	15,600	39,700	86,000	16,500	8,320	10,300
23....	12,000	7,590	4,380	8,640	6,000	47,800	15,600	40,700	87,400	16,500	8,320	10,300
24....	12,000	7,340	4,100	8,640	5,810	51,800	15,600	42,900	81,900	15,100	8,060	10,300
25....	12,000	7,340	4,100	8,640	6,000	43,000	15,600	52,100	75,200	14,700	8,320	10,300
26....	12,400	7,590	3,960	8,640	6,410	39,000	16,500	72,600	72,600	14,300	8,320	10,300
27....	13,200	7,840	3,960	8,640	6,860	36,400	17,400	79,200	69,900	13,900	8,060	10,300
28....	14,000	8,100	3,820	8,360	7,340	21,600	17,400	69,900	63,400	13,500	8,060	10,000
29....	14,000	8,930	3,960	8,100	-----	26,500	24,800	59,500	58,300	12,700	7,810	10,000
30....	14,500	10,600	4,380	7,840	-----	36,500	30,800	52,100	55,800	12,400	8,060	9,710
31....	14,500	-----	5,460	7,340	-----	87,500	-----	47,400	-----	12,000	8,930	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	14,500	10,600	11,600	713,000
November.....	14,500	7,340	9,270	552,000
December.....	13,600	3,820	7,770	478,000
January.....	9,240	6,630	8,180	503,000
February.....	8,640	5,810	7,550	419,000
March.....	87,500	7,840	28,400	1,750,000
April.....	57,000	15,100	19,900	1,180,000
May.....	73,200	18,000	39,200	2,410,000
June.....	83,800	46,210	70,800	4,210,000
July.....	52,100	12,000	25,100	1,540,000
August.....	12,000	7,810	9,070	558,000
September.....	38,600	9,710	16,000	952,000
The year.....	88,800	3,820	21,100	15,300,000

NOTE.—Discharge obtained from observer's daily staff-gage reading Mar. 30 to Apr. 8, Apr. 27 to May 18, July 2-14, Aug. 14-30.

MISSOURI RIVER NEAR MOBRIDGE, S.DAK.

LOCATION.—Wire gage in sec. 7, T. 18 N., R. 30 E., 3 miles west of Mobridge.
Zero of gage is 1,528.45 feet above mean sea level.

DRAINAGE AREA.—209,000 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 89,800 second-feet June 24 (gage height, 11.20 feet); minimum, not determined, occurred during winter.

1928-33: Maximum, 164,000 second-feet Mar. 29, 1929 (gage height, 12.2 feet, present datum); minimum, not determined, probably occurred during winter of 1931-32.

REMARKS.—Records good except those for ice period, Nov. 10 to Mar. 22, which were based on seven discharge measurements and temperature records.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	10,300	14,500					80,800	19,600	44,200	55,700	12,800	8,020
2.....	9,860	14,800					47,000	19,200	44,700	50,400	12,800	8,660
3.....	10,000	14,200	9,800	7,200	7,000	8,200	32,000	18,700	46,100	43,400	12,300	20,900
4.....	9,920	14,500					22,600	19,400	44,400	40,500	11,600	35,100
5.....	9,740	14,100					17,200	19,800	42,400	39,600	10,900	36,000
6.....	9,680	13,400			6,600		17,200	19,600	45,300	38,400	10,600	31,200
7.....	9,650	12,000			6,260		18,500	23,300	59,600	35,700	10,100	25,200
8.....	9,530	12,400	8,000	8,400		8,800	19,600	27,400	67,700	33,600	9,860	22,900
9.....	9,680	12,100			7,200		18,200	26,300	77,500	32,600	9,150	20,300
10.....	9,680	11,600					17,700	25,800	78,900	31,000	9,060	18,400
11.....	10,100				7,730		17,100	27,900	79,600	32,000	8,500	16,900
12.....	10,400						16,700	30,200	79,600	31,200	8,750	16,200
13.....	10,200	8,000	6,200	7,920	6,800	10,200	16,600	39,000	75,800	31,400	8,560	15,600
14.....	10,100						16,200	36,700	74,800	30,500	8,440	14,300
15.....	9,920						16,000	34,700	72,400	30,300	8,220	13,600
16.....	10,000			5,930			15,300	33,400	72,000	29,500	8,080	13,200
17.....	10,000						15,000	33,100	72,700	27,700	8,440	12,700
18.....	9,920	7,000	5,600		7,000	13,000	14,900	33,200	80,600	25,700	8,580	12,000
19.....	10,500			6,400			15,800	32,500	83,500	24,000	8,550	11,800
20.....	10,700						16,900	32,000	80,400	23,700	8,780	11,300
21.....	11,200				7,640	45,000	16,400	32,400	83,800	22,600	9,030	11,100
22.....	11,600					55,000	15,800	32,300	78,700	21,900	9,120	11,100
23.....	11,800	6,600	6,000	7,800	7,800	61,200	15,800	32,200	86,100	19,600	8,860	11,000
24.....	11,900					62,900	16,600	29,300	89,200	18,100	8,610	10,600
25.....	11,800			7,880		82,500	16,700	31,900	82,800	17,100	8,550	10,500
26.....	11,500			7,900		49,700	16,400	48,200	74,400	16,000	8,440	10,400
27.....	12,300			8,000	8,000	38,200	16,600	79,200	75,800	15,800	8,550	10,100
28.....	12,000			8,140		35,300	17,400	84,300	71,700	15,200	8,750	10,300
29.....	12,900	7,500	5,800	8,600		33,500	17,900	69,800	64,200	14,800	8,380	10,400
30.....	13,300			7,900		61,400	19,300	56,800	59,600	13,800	8,050	10,100
31.....	14,200			7,800		63,100		50,500		13,300	7,940	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	14,200	9,530	10,800	664,000
November.....	14,800		9,300	553,000
December.....			6,860	422,000
January.....			7,610	468,000
February.....			7,220	401,000
March.....	82,500		23,400	1,560,000
April.....	80,800	14,900	27,700	1,230,000
May.....	84,300	18,700	35,400	2,180,000
June.....	89,200	42,400	69,600	4,140,000
July.....	55,700	13,300	28,200	1,730,000
August.....	12,800	7,940	9,290	571,000
September.....	36,000	8,020	15,700	934,000
The year.....	89,200		20,500	14,900,000

MISSOURI RIVER AT PIERRE, S.DAK.

LOCATION.—Water-stage recorder in SW¼ sec. 32, T. 111 N., R. 7^W, at Pierre, 1½ miles above mouth of Bad River. Zero of gage is 1,415.1 feet above mean sea level.

DRAINAGE AREA.—242,000 square miles.

RECORDS AVAILABLE.—October 1929 to September 1933.

DISCHARGE.—Maximum during year, 119,000 second-feet May 28 (gage height, 10.29 feet); minimum, not determined, occurred during winter.

1929-33: Maximum, 121,000 second-feet June 15, 1932 (gage height, 10.96 feet); minimum, not determined, probably occurred during winter of 1931-32.

Maximum stage known, 21.0 feet in March 1881 (relation to present datum not known).

REMARKS.—Records good except those for period of ice effect, Nov. 10 to Mar. 20, which were based on seven discharge measurements and temperature records.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9,880	13,200					74,300	18,700	55,300	66,500	13,900	20,200
2	9,840	13,600					83,900	19,300	48,400	62,800	13,200	15,100
3	9,720	14,400	9,300	7,500	7,500	8,300	58,400	19,800	46,400	57,500	12,500	12,700
4	9,760	14,400					37,500	20,200	46,100	50,700	11,800	11,700
5	10,000	14,800					28,800	19,700	46,400	45,800	11,500	19,200
6	10,200	14,700					22,700	19,600	42,800	41,100	11,300	34,300
7	10,000	14,400			6,000		20,300	20,400	41,800	39,300	10,900	36,900
8	10,000	14,000	6,300	7,700		8,500	19,400	21,400	60,700	38,700	10,700	32,300
9	10,200	13,400			5,150		19,700	28,500	71,300	37,500	10,500	27,000
10	10,300	11,000			5,500		19,600	31,900	78,000	35,400	9,720	23,800
11	10,300			6,610			19,400	32,000	84,900	35,400	9,180	21,700
12	10,500						18,800	34,100	81,400	34,600	8,680	20,200
13	10,500	7,500	5,000	7,300	6,730	11,000	17,800	36,000	78,500	34,800	8,130	18,800
14	10,300						17,400	46,700	73,800	33,800	7,680	17,700
15	10,300						17,000	44,600	70,900	32,200	8,230	16,700
16	10,100			6,800			16,600	40,800	67,500	31,100	9,080	15,900
17	10,100			6,260			16,300	38,200	67,900	30,700	9,330	14,700
18	10,300	6,700	5,000		7,200	13,500	15,900	37,000	72,500	29,900	9,180	14,300
19	10,700			6,900			15,800	36,500	78,800	27,900	9,110	13,800
20	10,400						15,500	36,200	84,900	26,100	9,110	13,500
21	11,000					35,400	15,800	35,000	82,400	24,400	9,370	12,700
22	11,000					57,100	24,000	35,800	83,400	23,500	9,520	11,700
23	11,200	6,500	5,300	8,300	7,620	75,700	21,000	35,100	87,600	22,700	9,640	10,900
24	11,500					60,500	17,700	40,400	89,800	21,700	9,680	10,900
25	11,800					60,800	18,800	104,000	91,700	20,600	9,450	11,000
26	12,000			7,760		74,300	18,900	71,600	85,200	19,200	9,370	11,100
27	11,900			7,500	8,200	51,200	18,600	87,600	80,700	18,000	9,450	10,900
28	12,600	7,700	5,400	8,000		43,500	17,800	114,000	79,200	17,100	9,410	10,900
29	11,900			8,000		39,400	18,000	102,000	78,500	16,400	9,330	10,900
30	12,600			7,880		38,900	18,300	82,900	72,200	15,600	10,100	10,900
31	12,600			7,800		64,500		64,900		14,600	19,800	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	12,600	9,720	10,800	664,000
November	14,800		9,330	555,000
December			6,030	371,000
January			7,550	464,000
February			7,090	394,000
March	75,700		26,100	1,600,000
April	83,900	15,500	24,800	1,480,000
May	114,000	18,700	44,400	2,730,000
June	91,700	41,800	71,000	4,220,000
July	66,500	14,600	32,400	1,990,000
August	19,800	7,680	10,300	633,000
September	36,900	10,900	17,100	1,020,000
The year	114,000		22,300	16,100,000

MISSOURI RIVER AT YANKTON, S.DAK.

LOCATION.—Water-stage recorder between sec. 18, T. 93 N., R. 55 W., and sec. 13, T. 93 N., R. 56 W., in Yankton. Zero of gage is 1,161.23 feet above mean sea level.

DRAINAGE AREA.—269,000 square miles.

RECORDS AVAILABLE.—November 1930 to September 1933.

DISCHARGE.—Maximum during year, 111,000 second-feet May 28 (gage height, 8.21 feet); minimum not determined, but occurred during winter.

1930-33: Maximum, 124,000 second-feet June 18, 1932 (gage height, 9.68 feet); minimum not determined.

REMARKS.—Records good except those for period of ice effect, Dec. 1 to Mar. 2, which were based on five discharge measurements and temperature records.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1....	11,800	12,600	10,500	7,500	10,000	15,500	44,000	24,100	87,500	79,500	18,700	12,800
2....	11,800	13,200	10,600			16,700	69,700	23,600	75,200	75,000	20,100	16,200
3....	12,000	13,200	10,100			16,000	84,800	22,400	65,000	66,500	22,000	14,600
4....	11,900	14,000	9,970			14,800	87,500	22,000	55,000	60,700	18,800	22,000
5....	11,800	14,000	8,000			14,200	64,600	21,200	49,400	56,700	17,800	23,000
6....	11,600	13,800	6,200	7,800	8,200	13,700	50,200	21,600	47,500	52,800	16,900	20,200
7....	11,400	14,300				12,400	38,100	23,000	44,900	53,400	16,100	17,000
8....	11,400	14,400				10,800	31,700	24,000	45,400	51,700	15,600	15,800
9....	11,400	14,200				11,400	27,200	24,600	42,000	43,600	15,500	18,600
10....	11,400	14,300				11,000	23,900	24,600	44,800	39,500	15,200	30,100
11....	11,600	13,100	4,500	7,800	7,800	10,800	21,200	26,000	65,800	39,800	14,900	32,400
12....	12,000	11,500				10,500	22,100	36,600	85,800	44,000	15,800	36,000
13....	12,200	10,000				12,000	21,600	34,300	82,900	38,000	16,600	29,600
14....	12,400	9,000				13,200	23,200	33,300	79,800	36,200	13,800	23,800
15....	12,400	8,000				12,800	22,800	35,600	75,200	36,100	12,600	21,700
16....	12,400	7,200	4,500	9,000	8,210	19,800	22,000	45,000	73,000	35,100	12,200	20,900
17....	12,000	6,600				22,600	20,800	50,500	70,900	34,400	11,900	20,000
18....	11,900	6,400				22,600	19,800	51,200	69,300	34,100	11,600	18,600
19....	12,000	6,400				23,400	19,100	41,300	67,300	32,600	11,400	17,600
20....	12,000	6,600				26,700	18,400	39,200	70,000	31,600	11,200	16,900
21....	11,900	6,740	4,700	10,000	9,100	29,400	17,800	36,800	81,000	31,200	10,900	16,000
22....	11,800	7,000				29,700	17,500	36,300	88,800	30,400	11,100	15,300
23....	12,400	7,200				30,300	17,500	35,200	85,500	29,400	13,600	14,900
24....	12,600	7,400				40,300	17,200	35,600	84,300	28,600	17,000	14,300
25....	12,400	8,200				63,300	22,800	34,700	84,800	26,600	13,900	14,200
26....	12,000	8,210	6,400	10,800	10,500	58,900	30,700	52,800	87,000	25,200	12,900	14,000
27....	12,200	7,500				54,300	26,700	102,000	89,000	24,100	11,900	13,200
28....	11,800	7,600				58,300	24,000	75,000	83,400	22,800	11,800	12,800
29....	12,600	8,000				55,800	23,500	106,000	83,600	21,200	12,800	12,600
30....	12,400	9,840				52,100	23,800	104,000	78,800	20,000	13,400	12,200
31....	12,200					48,300		97,100		18,900	12,200	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	12,600	11,400	12,000	738,000
November.....	14,400	6,400	10,000	595,000
December.....	10,600		6,030	371,000
January.....			8,960	551,000
February.....			8,830	490,000
March.....	63,300	10,500	28,800	1,650,000
April.....	87,500	17,200	37,800	1,890,000
May.....	106,000	21,200	43,000	2,640,000
June.....	89,000	42,000	77,400	4,250,000
July.....	79,500	18,900	39,300	2,420,000
August.....	22,000	10,900	14,500	892,000
September.....	36,000	12,200	18,900	1,120,000
The year.....	106,000		27,300	17,600,000

MISSOURI RIVER AT OMAHA, NEBR.

LOCATION.—Water-stage recorder in sec. 23, T. 15 N., R. 14 E., half a mile downstream from Douglas Street Bridge, at Omaha. Zero of gage is 959.71 feet above near sea level.

DRAINAGE AREA.—323,000 square miles.

RECORDS AVAILABLE.—September 1928 to September 1933.

DISCHARGE.—Maximum during year, 102,000 second-feet May 29 (gage height, 13.03 feet); minimum, not determined, occurred during winter.

1928-33: Maximum, 198,000 second-feet June 7, 1929 (gage-height, 14.28 feet); minimum not determined.

REMARKS.—Records good except those for Nov. 16 to Feb. 26, which were estimated on the basis of United States Weather Bureau gage heights, seven discharge measurements, and temperature records. Stage-discharge relation affected by ice Dec. 4 to Jan. 5, Feb. 1-26.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12,800	11,900	9,210	8,500	11,600	20,800	52,700	27,500	89,100	76,400	20,000	11,800
2	12,800	12,000	9,790		11,400	17,200	47,800	26,400	79,800	73,100	18,900	13,100
3	12,700	12,200	10,400		10,600	22,900	52,100	24,000	66,800	71,600	17,700	13,900
4	12,500	12,200	8,800		10,200	22,200	69,700	21,800	56,400	68,100	18,100	15,400
5	12,400	12,800	6,500	8,000	9,500	19,200	76,100	20,000	50,800	61,400	20,200	16,300
6	12,400	13,400	4,500	10,400	8,000	18,300	74,200	18,600	48,600	56,000	23,500	17,700
7	12,400	13,600		10,400		16,500	54,200	18,600	43,200	54,200	20,500	27,900
8	12,300	14,000		11,300		16,400	44,800	19,200	41,600	51,800	18,200	26,200
9	12,100	14,600		10,700		15,300	37,600	21,300	42,500	50,300	18,500	22,600
10	11,900	15,200	4,000	10,100	8,300	13,800	33,100	22,800	43,300	48,100	17,900	18,800
11	11,800	15,300		9,210		12,900	30,700	24,300	40,200	42,000	16,700	15,100
12	11,700	16,000		10,100		13,100	28,400	25,100	48,800	43,700	16,200	20,100
13	11,800	15,900		9,500		13,000	26,100	25,900	69,100	38,700	15,900	32,500
14	11,900	15,600	4,500	8,930	9,000	12,400	24,600	38,500	74,400	43,900	15,600	37,300
15	12,000	14,800		8,370		12,100	24,400	37,800	76,800	39,900	17,000	36,300
16	12,200	10,700		8,370		11,900	24,500	34,300	76,100	34,200	18,400	29,800
17	12,300	7,840		8,650	10,000	12,600	24,300	37,800	72,100	34,200	15,200	27,100
18	12,300	7,840	4,800	8,370		13,400	23,800	54,500	68,900	35,600	13,800	24,100
19	12,300	8,100		7,840		23,400	22,600	53,600	65,700	34,100	13,300	22,000
20	12,100	7,840		7,840		22,900	22,200	43,300	63,000	32,800	13,000	20,600
21	12,100	8,650	6,500	7,840	10,700	25,000	21,500	38,000	64,000	32,000	12,900	18,600
22	12,400	8,370		8,930		37,000	20,300	36,400	65,700	30,600	12,800	17,700
23	12,600	7,590		10,400		38,000	20,600	35,300	72,100	30,300	13,000	17,300
24	12,500	7,350		11,000	11,300	36,200	19,700	36,400	79,300	31,900	12,400	16,800
25	12,300	7,350	8,500	10,400		40,400	19,400	36,900	81,400	32,700	12,100	17,000
26	12,000	7,590		11,000		11,000	71,600	20,100	35,700	81,600	13,100	17,500
27	12,000	7,590		10,700		12,000	70,700	20,300	34,100	80,000	16,700	15,800
28	12,100	8,100	8,650	11,300	11,600	13,300	59,000	29,200	81,200	84,600	17,000	15,300
29	12,000	8,650		11,600		66,000	32,500	95,800	83,300	23,900	14,500	15,200
30	11,900	8,650		10,700		67,500	28,000	78,000	83,300	22,900	13,100	14,800
31	11,900	-----		11,300	60,300	-----	-----	88,400	-----	20,800	12,100	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	12,800	11,700	12,200	750,000
November	16,000	7,350	11,100	660,000
December	10,400	-----	5,670	342,000
January	11,600	-----	9,600	590,000
February	13,300	-----	9,530	529,000
March	71,600	11,900	29,100	1,790,000
April	76,100	19,400	34,200	2,040,000
May	95,800	18,600	38,400	2,360,000
June	89,100	40,200	66,400	3,950,000
July	76,400	20,800	41,900	2,580,000
August	23,500	12,100	16,100	990,000
September	37,300	11,800	20,500	1,220,000
The year	95,800	-----	24,600	17,800,000

MISSOURI RIVER AT NEBRASKA CITY, NEBR.

LOCATION.—Water-stage recorder in sec. 10, T. 8 N., R. 14 E., at Chicago, Burlington & Quincy Railroad bridge at Nebraska City. Zero of gage is 903.94 feet above mean sea level.

DRAINAGE AREA.—414,000 square miles.

RECORDS AVAILABLE.—August 1929 to September 1933.

DISCHARGE.—Maximum during year, 112,000 second-feet May 29 (gage height, 12.2 feet); minimum, 3,230 second-feet Dec. 13, 14; minimum gage height, 5.4 feet Nov. 21.

1929-33: Maximum, 138,000 second-feet June 17-19, 1932; maximum gage height, 12.9 feet June 17, 1932; minimum, that of Dec. 13, 14, 1932; minimum gage height, 4.30 feet Dec. 3, 1929.

Maximum stage known, 18.0 feet in April 1881.

REMARKS.—Records good except those for periods of ice effect, Dec. 7 to Jan. 24, Feb. 3-22, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16,900	16,600	14,500	11,400	18,100	28,500	64,900	37,200	94,400	82,700	23,000	15,200
2	16,600	17,100	13,600	12,200	15,200	32,100	61,300	43,300	88,000	76,000	24,000	15,600
3	16,600	17,100	14,100	13,400	12,600	29,700	57,800	37,600	74,100	74,100	21,900	16,500
4	16,600	17,100	14,100	15,200	10,300	34,500	76,000	35,800	64,700	72,200	21,200	17,600
5	16,400	17,600	15,700	16,100	8,200	32,100	82,700	33,300	61,100	66,500	21,200	20,000
6	16,200	17,600	15,700	16,100	7,500	33,300	85,300	30,900	56,500	59,300	24,000	21,900
7	16,400	18,100	7,500	16,100	7,500	32,100	70,300	28,500	52,100	55,800	25,700	24,700
8	16,600	18,100	5,810	16,100	7,500	29,700	59,300	28,500	50,400	57,500	22,200	31,400
9	16,100	18,700	3,750	16,800	7,500	30,000	52,400	35,800	49,400	54,100	21,000	29,800
10	16,100	19,100	3,750	16,800	7,500	25,500	47,400	38,600	51,100	57,500	21,000	26,800
11	16,100	19,700	4,030	14,700	7,500	22,900	38,600	39,900	50,100	54,100	20,400	24,000
12	15,600	20,400	4,030	13,800	7,850	20,800	35,800	37,200	51,800	52,400	19,800	22,600
13	15,600	19,700	3,230	14,700	7,850	20,200	34,500	37,200	76,300	49,000	19,200	33,800
14	15,600	19,100	3,230	14,700	8,900	20,200	29,700	39,900	81,300	52,400	18,800	37,300
15	15,600	17,800	4,870	14,700	11,100	20,100	29,700	54,100	80,700	49,000	18,200	37,300
16	16,100	16,700	4,870	14,200	11,100	20,100	28,500	50,700	78,300	42,800	18,800	35,400
17	16,100	14,100	4,870	13,800	11,100	20,700	28,500	49,000	76,100	39,900	20,000	31,400
18	16,100	12,700	5,150	13,800	11,400	24,200	29,300	57,500	74,030	43,700	18,200	33,000
19	16,100	12,200	5,480	13,800	13,000	25,000	28,100	64,700	68,200	43,300	18,200	32,200
20	16,600	12,200	5,480	14,200	15,200	38,600	27,000	57,500	66,300	41,900	18,200	31,400
21	16,600	11,800	5,480	14,700	18,100	33,300	26,000	50,700	65,000	40,600	18,200	28,200
22	16,600	12,300	5,480	14,700	21,400	39,900	26,000	45,800	65,000	36,500	17,000	26,100
23	18,100	11,800	5,810	15,200	25,000	44,300	26,000	42,800	66,800	35,300	16,000	24,700
24	18,700	13,000	5,810	17,100	29,700	44,300	26,000	42,800	76,600	35,300	17,000	23,300
25	18,700	15,900	5,150	20,000	21,400	49,000	28,500	44,300	81,200	36,500	18,200	22,600
26	18,100	14,900	5,150	19,300	21,400	72,200	28,500	44,300	81,200	76,500	15,600	22,600
27	18,700	14,500	6,800	20,700	24,000	78,000	30,900	42,800	83,800	34,100	17,000	23,300
28	18,100	14,000	7,150	16,100	24,000	64,900	32,100	64,700	85,000	31,700	20,000	20,600
29	18,100	14,000	8,550	15,200	-----	68,500	42,800	105,000	86,800	26,100	19,800	18,800
30	17,600	14,500	10,700	19,300	-----	72,300	39,900	82,700	86,800	26,100	17,400	18,200
31	17,100	-----	11,100	18,700	-----	68,500	-----	88,000	-----	24,000	15,600	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18,700	15,600	16,800	1,030,000
November	20,400	11,800	15,900	946,000
December	15,700	3,230	7,450	458,000
January	20,700	11,400	15,600	959,000
February	29,700	7,500	14,000	778,000
March	78,000	20,100	37,900	2,330,000
April	85,300	26,000	42,500	2,330,000
May	105,000	28,500	48,100	2,960,000
June	94,400	49,400	70,800	4,210,000
July	82,700	24,000	48,000	2,950,000
August	25,700	15,600	19,600	1,210,000
September	37,300	15,200	25,500	1,520,000
The year	105,000	3,230	30,200	21,900,000

MISSOURI RIVER AT ST. JOSEPH, MO.

LOCATION.—Water-stage recorder in sec. 17, T. 57 N., R. 35 W., at St. Joseph & Grand Island Railway bridge at St. Joseph, Buchanan County. Zero of gage is 793.69 feet above mean sea level.

DRAINAGE AREA.—424,000 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 112,000 second-feet May 30 (gage height, 8.7 feet); minimum, 3,730 second-feet Dec. 15, 16 (gage height, -4.3 feet).

1928-33: Maximum, 196,000 second-feet June 4, 1929 (gage height, 10.1 feet); minimum, that of Dec. 15, 16, 1932.

Maximum stage known, 21.7 feet Apr. 29, 1881.

REMARKS.—Records good except those for periods of ice effect, Dec. 7-11, 19-27, Feb. 7-20, which are poor. United States Weather Bureau gage used Dec. 9-24, Feb. 12-14, May 31 to June 14, Sept. 8-30.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18,800	18,800	15,400	12,800	19,000	25,100	73,600	40,200	91,700	88,800	28,200	18,100
2	18,300	18,600	15,400	12,100	19,000	26,200	69,000	38,700	93,500	82,000	27,700	16,200
3	18,300	18,600	15,800	12,800	19,000	30,800	61,700	41,000	89,900	75,600	25,100	15,400
4	17,900	18,600	16,300	15,100	18,100	30,500	57,900	39,400	79,000	72,000	24,100	15,800
5	17,500	18,600	16,700	17,300	14,700	32,500	82,400	38,700	66,500	70,000	23,600	16,900
6	17,500	18,600	16,900	19,500	9,100	34,200	96,500	36,600	60,700	66,100	21,700	18,100
7	17,100	18,600	12,800	22,700	8,320	34,200	91,100	34,000	57,900	60,500	22,100	19,900
8	16,800	19,500	10,400	18,600	8,320	32,200	69,500	32,100	50,700	60,200	25,300	21,700
9	17,500	20,400	8,410	17,700	8,320	30,600	60,100	31,400	49,900	60,500	25,700	25,700
10	17,900	19,900	6,380	17,700	8,320	29,500	50,800	33,300	49,800	54,900	23,600	32,700
11	17,500	20,300	4,420	19,000	8,320	27,800	45,400	38,000	49,600	55,400	22,200	30,800
12	17,100	20,800	4,190	18,100	8,320	25,100	41,000	38,000	51,600	56,200	24,100	37,900
13	16,800	20,800	4,650	15,400	8,320	23,600	36,600	39,400	52,600	52,600	21,700	24,600
14	16,400	20,800	4,650	15,100	8,610	21,700	34,600	38,700	80,600	52,600	20,400	25,700
15	16,400	20,400	3,960	16,200	9,240	20,800	32,700	42,800	83,800	50,900	19,000	38,400
16	16,400	20,000	3,730	17,300	9,920	20,400	31,400	52,600	82,200	52,200	18,600	39,400
17	16,800	18,400	5,340	17,700	10,600	20,400	30,800	48,900	79,000	47,800	18,100	37,300
18	16,800	16,400	5,340	17,300	11,300	20,400	30,200	45,600	74,000	43,700	19,000	36,600
19	16,800	15,300	5,340	15,400	11,600	21,700	29,600	53,900	71,500	43,600	19,000	33,000
20	16,800	14,200	5,570	15,100	12,700	29,000	29,600	65,000	68,700	43,600	18,100	33,000
21	16,800	13,500	6,090	15,800	14,900	36,600	30,200	60,700	68,700	41,900	19,400	32,300
22	17,100	13,100	6,090	15,800	19,900	34,600	29,000	52,600	63,900	40,500	21,600	30,900
23	17,500	13,500	6,090	16,900	21,700	37,600	28,500	47,800	63,300	38,900	21,300	27,900
24	18,300	14,000	6,380	24,600	24,600	42,900	27,300	46,700	66,500	37,600	18,100	25,700
25	19,200	13,600	6,960	25,100	25,300	45,600	26,800	43,700	72,500	36,300	17,700	25,100
26	20,100	14,400	8,120	22,200	25,300	46,600	27,900	44,600	78,200	34,700	18,600	27,300
27	20,100	17,400	10,400	20,800	22,700	68,500	29,600	44,600	77,800	34,100	19,500	35,000
28	19,700	16,700	11,400	19,500	23,200	76,200	30,800	44,600	84,100	34,100	16,600	27,800
29	19,700	15,600	10,700	19,000	65,500	31,400	68,000	85,800	32,200	32,200	17,100	25,200
30	18,800	15,100	10,400	18,600	73,000	37,300	106,000	82,400	28,900	20,400	21,600	21,600
31	19,200	11,400	18,600	80,000	92,900	92,900	28,900	19,900	19,900	19,900	19,900	19,900

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	20,100	16,400	17,800	1,090,000
November	20,800	13,100	17,500	1,040,000
December	16,900	3,730	8,890	547,000
January	25,100	12,100	17,700	1,090,000
February	25,300	8,320	14,600	811,000
March	80,000	20,400	36,900	2,270,000
April	96,500	26,800	45,100	2,680,000
May	106,000	31,400	47,800	2,940,000
June	93,500	49,600	70,900	4,220,000
July	88,800	28,900	50,900	3,130,000
August	28,200	16,600	21,200	1,300,000
September	39,400	15,400	26,900	1,600,000
The year	106,000	3,730	31,400	22,700,000

MISSOURI RIVER AT KANSAS CITY, MO.

LOCATION.—Water-stage recorder in sec. 31, T. 50 N., R. 33 W., at Chicago, Burlington & Quincy Railroad bridge at Kansas City, 1 mile below Kansas River. Zero of gage is 715.79 feet above mean sea level.

DRAINAGE AREA.—489,000 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 109,000 second-feet May 31 (gage height, 14.7 feet); minimum, 5,160 second-feet Dec. 17, 18 (gage height, 2.7 feet).

1928-33: Maximum, 254,000 second-feet June 5, 1929 (gage height, 23.4 feet); minimum, that of Dec. 17, 18, 1932; minimum gage height, 2.4 feet Jan. 10, Dec. 27, 1930.

Maximum stage known, 38.0 feet June 16, 1844.

REMARKS.—Records good except those during periods of ice effect, Dec. 7-26, Feb. 8-24, which are poor. Discharge estimated Dec. 20-22, 25. United States Weather Bureau gage used Nov. 17-27, Dec. 9-19, 22, 24, Dec. 26 to Jan. 5, Feb. 2-21, Mar. 21, 22, Apr. 15-30, May 7-11, June 4-27, July 6 to Aug. 28, Sept. 7-30.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	21,800	21,000	16,700	13,600	21,000	25,000	81,500	43,800	95,600	87,200	30,700	26,400
2.....	22,300	20,600	17,100	12,900	21,000	26,700	78,500	45,400	101,000	84,100	30,700	23,900
3.....	21,400	20,400	17,800	14,000	20,600	29,700	74,500	43,000	102,000	84,100	30,700	23,000
4.....	21,400	20,400	17,300	14,400	21,000	34,100	68,700	46,200	92,400	78,000	28,200	27,500
5.....	21,000	20,400	17,700	18,300	18,000	33,000	72,500	45,400	81,000	69,100	26,000	28,200
6.....	20,100	20,000	18,100	22,000	16,500	36,100	88,200	44,600	67,200	67,200	24,400	29,000
7.....	19,700	20,400	17,300	26,900	13,800	37,600	93,300	42,200	60,800	62,600	23,400	25,400
8.....	19,300	21,300	14,700	24,800	10,400	36,800	86,100	38,300	58,100	59,900	23,400	29,000
9.....	19,700	21,300	11,800	21,500	9,600	34,800	71,100	36,800	50,600	64,500	26,400	28,200
10.....	19,700	22,000	10,000	20,700	9,600	33,000	59,000	38,300	51,500	63,600	28,100	31,300
11.....	19,700	22,500	7,900	20,700	9,600	32,300	51,900	42,200	50,600	59,000	24,900	37,300
12.....	19,300	22,500	6,860	20,500	9,600	29,800	44,600	47,000	52,400	59,900	24,900	36,800
13.....	19,300	22,500	5,500	19,600	9,600	28,100	40,600	50,300	54,100	59,000	26,700	34,200
14.....	18,900	22,500	5,500	17,700	9,600	27,000	37,600	49,500	55,500	52,800	23,900	30,400
15.....	18,500	22,500	5,500	17,300	10,000	24,900	35,500	48,700	75,000	52,800	21,500	40,000
16.....	18,200	22,000	5,500	17,700	10,400	24,400	33,600	54,600	83,100	51,100	20,200	51,300
17.....	18,500	21,600	5,160	18,900	10,700	22,900	33,000	61,700	82,100	52,800	19,800	47,200
18.....	18,500	20,300	5,160	19,300	11,400	22,900	32,300	61,700	80,000	47,000	18,500	43,200
19.....	18,500	18,200	5,840	18,900	12,900	23,400	33,000	61,700	74,500	43,800	19,500	40,800
20.....	18,200	16,300	6,860	17,900	13,600	25,900	33,000	67,200	71,000	44,600	20,800	39,000
21.....	18,200	16,000	6,860	17,100	14,400	34,200	36,100	75,000	68,000	45,400	20,200	39,800
22.....	18,500	15,200	7,550	17,500	16,200	36,800	37,600	69,100	67,000	43,800	24,900	39,800
23.....	18,900	15,300	7,550	17,900	19,200	34,800	39,000	60,800	64,300	41,400	25,600	36,100
24.....	19,300	15,000	7,550	19,000	23,000	40,800	35,500	56,400	64,300	39,800	26,600	32,300
25.....	20,100	15,000	7,900	28,100	27,100	47,500	33,600	57,200	68,000	37,600	21,500	29,800
26.....	21,000	15,300	8,950	25,400	27,700	49,200	34,200	60,800	76,000	36,800	21,300	28,700
27.....	21,900	16,400	12,900	23,500	27,200	59,200	37,600	55,500	80,000	36,800	31,100	37,600
28.....	21,900	17,900	15,100	21,900	24,900	80,000	37,600	51,900	82,000	36,800	33,500	42,200
29.....	21,900	18,300	17,000	21,000	-----	75,500	38,300	51,900	86,200	36,100	29,700	39,800
30.....	21,400	17,800	15,500	20,600	-----	69,600	39,000	87,200	90,300	33,800	27,000	35,500
31.....	21,000	-----	14,400	20,100	-----	78,500	-----	106,000	-----	31,300	27,000	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	22,300	18,200	19,900	1,220,000
November.....	22,500	15,000	19,400	1,150,000
December.....	18,100	5,160	11,000	676,000
January.....	28,100	12,900	19,700	1,210,000
February.....	27,700	9,600	16,000	889,000
March.....	80,000	22,900	58,500	2,370,000
April.....	93,300	32,300	50,600	3,010,000
May.....	106,000	36,800	54,900	3,380,000
June.....	102,000	50,600	72,800	4,330,000
July.....	87,200	31,300	53,600	3,300,000
August.....	33,500	18,500	25,200	1,550,000
September.....	51,300	23,000	34,300	2,040,000
The year.....	106,000	5,160	34,700	25,100,000

MISSOURI RIVER AT WAVERLY, MO.

LOCATION.—Wire gage in sec. 14, T. 51 N., R. 24 W., at bridge on State highway 24 at Waverly. Zero of gage is 640.49 feet above mean sea level.

DRAINAGE AREA.—491,000 square miles.

RECORDS AVAILABLE.—March 1929 to September 1933.

DISCHARGE.—Maximum during year, 111,000 second-feet June 1 (gage height, 20.4 feet); minimum, 5,960 second-feet Dec. 17, 18; minimum gage height, 9.1 feet Nov. 25, 26.

1929-33: Maximum, 263,000 second-feet June 5, 1929 (gage height, 24.9 feet); minimum, that of Dec. 17, 18, 1932; minimum gage height, 5.4 feet Jan. 12, 1930.

Maximum stage known, 25.9 feet July 22, 1915.

REMARKS.—Records good except those for periods of ice effect, Dec. 9 to Jan. 7, Feb. 9-23, which are poor. Gage-height records furnished by United States Army Engineers.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	24,900	21,300	17,800	15,000	19,900	24,600	84,900	40,100	106,000	90,700	32,000	25,600
2.....	23,900	21,300	16,800	13,600	20,400	24,600	82,300	44,900	98,000	89,500	30,900	25,600
3.....	22,000	21,300	17,100	13,200	20,800	26,200	78,600	44,900	104,000	87,500	30,300	22,900
4.....	21,500	20,400	17,600	14,300	20,400	30,700	65,700	43,400	101,000	77,400	30,300	21,400
5.....	21,500	20,400	17,600	14,600	20,400	35,400	65,700	47,300	87,500	71,400	28,700	25,500
6.....	20,800	20,400	18,000	18,000	19,600	35,200	77,000	48,100	73,800	69,000	24,500	27,700
7.....	19,900	20,400	18,400	19,200	15,600	38,900	95,600	45,600	63,500	65,700	24,000	25,500
8.....	19,900	20,400	19,200	29,400	13,600	39,500	98,000	42,400	59,500	60,500	22,900	25,000
9.....	19,900	20,800	15,700	26,100	10,600	38,300	87,500	38,700	54,200	64,600	23,500	26,000
10.....	19,900	21,700	12,500	21,900	9,640	37,000	71,400	36,700	50,800	62,500	26,000	27,700
11.....	19,900	21,700	9,640	21,000	9,640	34,600	58,500	37,300	51,700	60,500	28,100	30,900
12.....	19,500	22,600	7,600	20,500	9,640	33,400	49,800	43,700	50,800	58,500	25,000	36,200
13.....	19,500	22,600	6,760	20,700	9,640	30,900	44,200	53,300	50,800	59,500	25,600	37,000
14.....	19,500	22,600	6,480	19,800	9,640	28,700	40,100	52,400	50,800	55,000	26,100	35,800
15.....	19,100	22,600	6,480	18,900	9,960	27,700	38,300	49,600	56,800	52,100	23,500	31,100
16.....	18,700	22,600	6,200	17,700	10,300	25,500	34,600	47,900	78,600	53,100	21,900	43,900
17.....	18,700	22,100	5,960	18,100	10,600	24,500	32,800	55,700	84,900	53,300	20,900	54,900
18.....	18,300	21,700	5,960	18,900	10,600	23,400	32,900	63,000	83,600	50,700	20,400	48,000
19.....	18,300	20,800	6,760	19,800	11,600	22,900	32,300	62,000	76,200	45,600	19,500	43,400
20.....	18,700	18,400	6,760	19,800	14,600	22,900	32,300	62,500	71,400	42,700	19,000	40,800
21.....	18,700	16,400	7,040	18,900	14,600	23,900	32,900	77,400	68,900	44,700	20,400	39,500
22.....	18,700	16,000	7,320	17,600	14,600	30,400	35,800	86,200	66,600	44,700	21,400	39,500
23.....	18,700	15,500	7,600	17,600	16,100	37,400	38,200	71,400	65,500	41,900	25,100	39,300
24.....	18,700	15,100	8,160	17,600	21,900	33,800	38,200	58,500	63,500	40,600	26,700	36,200
25.....	19,100	15,100	9,320	18,400	25,700	42,700	35,800	55,900	64,500	39,700	25,700	32,300
26.....	19,500	14,900	9,960	27,200	25,700	50,700	32,800	64,600	70,000	38,400	20,900	29,900
27.....	20,400	15,300	10,600	26,100	27,300	49,800	33,900	66,800	76,200	38,400	21,400	28,800
28.....	21,400	16,300	14,600	23,500	27,300	66,800	36,300	56,800	81,300	37,200	31,200	38,300
29.....	21,900	18,300	18,000	21,700	-----	84,900	36,900	51,500	92,800	37,200	34,000	43,400
30.....	21,900	18,300	19,200	21,300	-----	67,900	39,400	52,900	97,000	36,600	29,400	40,100
31.....	21,300	-----	16,800	20,400	-----	71,400	-----	98,000	-----	33,200	26,700	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	24,900	18,300	20,200	1,240,000
November.....	22,600	14,900	19,600	1,170,000
December.....	19,200	5,960	11,900	732,000
January.....	29,400	13,200	19,700	1,210,000
February.....	27,300	9,640	16,100	894,000
March.....	84,900	22,900	37,600	2,310,000
April.....	98,000	32,300	52,100	3,100,000
May.....	98,000	36,700	54,800	3,370,000
June.....	106,000	50,800	73,300	4,360,000
July.....	90,700	33,200	54,900	3,380,000
August.....	34,000	19,000	25,400	1,560,000
September.....	54,900	21,400	34,100	2,030,000
The year.....	106,000	5,960	35,000	25,400,000

MISSOURI RIVER AT BOONVILLE, MO.

LOCATION.—Water-stage recorder in sec. 35, T. 49 N., R. 17 W., at Missouri-Kansas-Texas Railroad bridge at Boonville. Zero of gage is 564.95 feet above mean sea level.

DRAINAGE AREA.—506,000 square miles.

RECORDS AVAILABLE.—October 1925 to September 1933.

DISCHARGE.—Maximum during year, 105,000 second-feet June 2, 4; maximum gage height, 14.9 feet June 2; minimum, 6,200 second-feet Dec. 18; minimum gage height, 1.0 foot Dec. 14, 15.

1926-33: Maximum, 381,000 second-feet Apr. 23, 1927 (gage height, 23.9 feet); minimum discharge and gage height, those of December 19².

Maximum stage known, 32.7 feet June 21, 1844.

REMARKS.—Records good except those for periods of ice effect, Dec. 14-21, Feb. 12-18, which are poor. United States Weather Bureau gage used Nov. 20 to Dec. 2, Dec. 11-22, Feb. 7-21.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	26,800	22,400	19,100	20,200	22,200	31,500	91,000	39,900	96,000	103,000	33,800	30,800
2.....	25,400	21,900	18,600	19,100	21,700	29,000	100,000	41,200	102,000	97,000	31,800	26,200
3.....	24,100	21,900	18,100	18,100	22,700	27,100	97,000	43,900	100,000	92,000	30,500	27,000
4.....	24,000	21,700	18,100	18,600	22,700	27,700	91,000	46,200	105,000	88,000	30,900	27,700
5.....	23,400	21,700	18,100	19,100	22,700	30,200	82,000	46,900	100,000	80,000	32,700	25,200
6.....	22,900	21,200	18,600	19,100	22,100	37,400	75,000	49,900	87,000	75,000	29,600	25,800
7.....	20,800	20,100	19,100	20,800	16,600	39,000	85,000	52,700	76,000	71,000	26,700	29,000
8.....	20,300	21,200	19,100	24,800	8,680	45,200	99,000	50,400	65,000	67,000	24,800	28,000
9.....	19,800	22,800	19,700	29,200	7,100	48,200	102,000	47,400	61,300	63,100	24,200	26,100
10.....	20,800	25,200	18,100	30,500	7,100	43,700	86,000	42,400	57,200	64,100	25,700	25,500
11.....	21,300	27,200	13,000	26,100	9,680	41,000	70,000	41,700	53,400	66,000	34,000	26,700
12.....	24,800	27,900	9,940	22,500	10,900	37,700	61,300	56,400	53,400	64,100	36,000	29,200
13.....	23,600	26,500	8,460	21,900	10,200	35,700	52,700	74,000	52,000	60,400	30,200	34,400
14.....	21,900	25,200	6,950	21,600	10,200	35,000	46,700	91,000	52,000	59,600	28,000	38,300
15.....	21,400	24,500	6,500	21,000	10,200	31,200	43,700	90,000	52,000	56,400	28,600	37,700
16.....	20,800	24,500	6,500	20,500	10,200	28,600	43,000	74,000	56,700	53,400	27,400	34,400
17.....	19,800	24,500	6,350	19,400	10,500	26,700	40,700	67,000	77,000	52,000	24,800	43,000
18.....	19,400	24,000	6,200	18,400	10,900	24,200	38,000	65,000	81,400	52,700	23,000	55,400
19.....	19,400	22,900	6,800	20,800	11,200	24,200	34,700	67,000	79,000	52,000	21,300	49,700
20.....	19,000	21,800	7,430	35,000	8,680	23,000	35,000	65,000	76,000	47,400	20,800	44,400
21.....	19,000	19,400	8,900	36,400	15,600	23,000	34,400	72,000	72,000	44,400	20,800	41,400
22.....	19,400	18,200	16,600	32,400	31,200	23,600	35,000	93,000	70,000	45,500	21,300	40,000
23.....	19,400	17,400	21,500	35,000	33,100	30,500	37,200	97,000	68,000	45,500	24,800	40,700
24.....	19,400	17,000	31,300	29,900	28,600	38,400	39,200	86,000	66,000	43,200	36,400	44,000
25.....	19,800	16,600	41,700	24,200	26,100	41,700	40,500	74,000	64,100	41,200	36,400	40,400
26.....	19,800	15,800	53,400	21,900	30,700	53,000	37,200	72,000	66,000	39,700	31,200	35,000
27.....	20,300	16,300	55,200	26,100	31,500	63,000	34,500	88,000	71,000	38,300	26,100	32,200
28.....	20,700	16,300	46,200	30,500	30,900	61,200	34,500	93,000	77,000	37,500	23,000	38,000
29.....	21,700	16,700	36,300	27,400	-----	74,000	37,200	80,000	85,000	36,900	28,600	53,400
30.....	22,300	17,900	32,100	24,800	-----	87,000	38,500	69,000	101,000	37,500	38,300	60,000
31.....	22,800	-----	25,000	22,900	-----	83,000	-----	67,000	-----	35,700	37,000	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	26,800	19,000	21,400	1,320,000
November.....	27,900	15,800	21,400	1,270,000
December.....	55,200	6,200	20,400	1,250,000
January.....	36,400	18,100	24,500	1,510,000
February.....	33,100	7,100	18,000	1,000,000
March.....	87,000	23,000	40,200	2,470,000
April.....	102,000	34,400	58,100	3,460,000
May.....	97,000	39,900	65,900	4,050,000
June.....	105,000	52,000	74,100	4,410,000
July.....	103,000	35,700	58,400	3,590,000
August.....	38,300	20,800	28,700	1,760,000
September.....	60,000	25,200	36,300	2,160,000
The year.....	105,000	6,200	39,000	28,200,000

MISSOURI RIVER NEAR BONNOTS MILL, MO.

LOCATION.—Water-stage recorder in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 5, T. 44 N., R. 9 W., $1\frac{1}{2}$ miles east of Bonnots Mill. Zero of gage is 511.25 feet above mean sea level.

DRAINAGE AREA.—523,000 square miles.

RECORDS AVAILABLE.—October 1931 to September 1933; at Isbell, 2 miles downstream, December 1928 to September 1931.

DISCHARGE.—Maximum during year, 142,000 second-feet May 27; maximum gage height, 15.5 feet May 27, 28; minimum, 10,000 second-feet Dec. 20 (gage height, —1.2 feet).

1928–33: Maximum, 399,000 second-feet June 8, 1929; minimum discharge and gage height, those of Dec. 20, 1932.

REMARKS.—Records good except those estimated Oct. 13–20. Nov. 18–21, Jan. 23–28, 30, 31, Feb. 1–4, which are fair.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31,100	23,400	19,500	35,500	40,000	41,900	104,000	42,900	96,600	102,000	36,200	40,100
2	29,200	24,800	20,800	28,000	39,000	41,900	112,000	44,400	117,000	104,000	36,200	35,800
3	27,500	24,000	24,300	24,000	39,000	39,800	114,000	49,100	122,000	98,100	37,100	32,000
4	26,400	24,500	20,300	26,800	38,500	39,100	106,000	52,400	116,000	92,600	36,400	30,100
5	25,300	24,000	19,900	29,700	37,600	39,000	99,000	55,800	114,000	89,400	36,200	27,600
6	25,300	24,000	19,100	30,300	34,100	36,200	90,400	59,400	110,000	83,300	36,900	26,400
7	25,300	23,800	19,100	31,600	39,000	50,200	85,100	61,200	97,400	76,200	33,400	29,400
8	25,300	23,800	20,200	34,100	32,700	60,000	99,000	60,300	86,800	73,700	29,800	33,400
9	23,800	24,300	20,600	33,500	23,000	61,800	108,000	59,400	76,700	69,700	29,800	34,100
10	23,400	26,900	21,100	39,600	22,400	60,900	105,000	57,600	72,700	64,900	28,400	32,000
11	22,900	28,400	22,400	43,600	20,600	55,200	89,700	55,800	65,900	68,800	30,400	28,800
12	23,800	29,700	18,600	39,700	18,400	50,900	77,200	83,700	59,300	71,700	38,100	29,400
13	20,000	29,600	14,200	36,900	15,000	44,600	67,500	130,000	60,600	68,900	40,300	37,200
14	26,800	28,900	12,800	36,200	17,600	45,300	60,000	140,000	57,900	63,000	33,800	41,600
15	25,300	28,100	11,500	33,500	19,200	46,700	56,000	133,000	56,700	62,100	31,000	45,400
16	23,500	28,100	10,500	29,700	17,600	43,900	56,800	117,000	54,900	53,500	32,400	44,400
17	21,900	28,100	10,500	30,300	17,600	41,800	54,200	102,000	63,000	54,900	31,700	39,100
18	21,400	27,200	10,300	32,200	18,200	39,400	50,600	108,000	79,700	53,000	29,100	45,900
19	21,500	25,800	10,300	48,100	18,600	41,200	47,400	113,000	83,800	55,700	27,200	58,500
20	21,500	24,900	10,000	46,300	22,000	34,200	43,200	105,000	81,200	54,900	25,400	56,600
21	21,600	23,400	12,000	57,300	20,500	35,600	41,100	103,000	79,700	57,000	23,000	49,800
22	21,600	22,000	12,800	78,100	30,100	35,600	43,200	111,000	75,700	47,500	22,500	45,100
23	21,600	20,600	17,200	60,000	38,300	36,300	43,200	124,000	72,700	48,300	24,200	45,900
24	20,600	20,200	55,300	49,000	43,200	40,500	43,200	127,000	70,800	48,300	29,100	49,100
25	21,600	19,400	76,900	45,000	44,600	49,600	47,400	135,000	66,900	45,100	39,600	45,900
26	23,800	18,200	61,300	43,000	40,400	51,700	50,200	134,000	66,900	43,600	41,100	42,100
27	23,400	18,200	70,100	42,000	39,000	62,500	48,800	141,000	67,300	42,100	35,200	41,900
28	22,900	17,800	82,900	44,000	41,300	71,900	46,000	139,000	73,200	33,800	28,400	37,300
29	22,900	17,800	74,500	45,400	-----	75,000	43,900	129,000	80,200	33,300	26,000	39,100
30	23,400	18,300	50,800	39,000	-----	100,000	43,200	113,000	89,400	33,800	31,700	55,200
31	23,400	-----	41,200	38,000	-----	110,000	-----	104,000	-----	33,100	41,900	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	31,100	20,600	24,100	1,480,000
November	29,700	17,800	24,000	1,430,000
December	82,900	10,000	28,600	1,760,000
January	78,100	24,300	39,700	2,440,000
February	44,600	15,000	29,600	1,640,000
March	110,000	34,200	51,000	3,140,000
April	114,000	41,100	69,200	4,120,000
May	141,000	42,900	96,500	5,930,000
June	122,000	54,900	80,500	4,790,000
July	104,000	38,100	62,700	3,860,000
August	41,900	22,500	32,300	1,990,000
September	58,500	26,400	40,000	2,380,000
The year	141,000	10,000	48,300	35,000,000

MISSOURI RIVER AT HERMANN, MO.

LOCATION.—Water-stage recorder in SW¼ sec. 25, T. 46 N., R. 5 W., at highway bridge at Hermann. Zero of gage is 481.49 feet above mean sea level.

DRAINAGE AREA.—528,000 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 183,000 second-feet May 14 (gage height, 19.4 feet); minimum, 10,700 second-feet Dec. 21; minimum gage height, 0.4 foot Dec. 22.

1928-33: Maximum, 407,000 second-feet June 8, 1929 (gage height, 24.6 feet); minimum discharge and gage height, those of December 1932.

Maximum stage known, 35.7 feet in June 1844.

REMARKS.—Records good. Stage-discharge relation affected by ice Dec. 18-21. United States Weather Bureau gage used Dec. 12-23, Feb. 7-27.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	33,600	24,500	19,200	43,600	43,600	42,400	107,000	47,500	101,000	102,000	39,500	42,800
2-----	30,800	25,000	20,500	37,100	42,400	43,000	109,000	46,100	115,000	108,000	38,300	39,700
3-----	29,600	26,000	21,500	30,800	41,800	43,000	115,000	51,000	126,000	102,000	38,900	35,500
4-----	28,000	26,500	22,000	29,100	41,800	41,200	110,000	53,800	120,000	95,700	39,500	32,300
5-----	27,000	26,000	21,000	33,100	40,600	40,100	104,000	56,700	116,000	90,200	37,100	30,100
6-----	27,000	25,500	21,000	33,600	37,700	40,100	97,900	58,800	114,000	86,000	37,700	26,900
7-----	27,000	25,500	20,600	34,200	35,400	51,800	90,200	64,600	104,000	79,000	35,900	23,000
8-----	26,500	25,000	20,600	34,800	36,000	65,200	96,800	72,100	92,400	74,100	33,500	31,900
9-----	25,500	24,500	20,700	35,400	28,000	67,000	107,000	61,700	82,000	72,800	31,900	34,500
10-----	25,000	25,500	22,000	37,100	24,500	70,000	110,000	58,800	76,000	67,400	31,300	35,100
11-----	24,000	28,000	23,500	43,600	23,500	66,100	98,700	58,800	70,300	67,400	31,300	32,300
12-----	23,500	29,600	23,000	44,600	21,500	58,500	87,900	95,700	66,900	72,300	35,300	29,600
13-----	26,500	30,800	18,100	40,600	17,800	52,500	75,900	150,000	61,700	69,700	40,800	34,100
14-----	28,600	30,800	15,700	38,800	15,600	47,900	68,100	178,000	61,700	65,200	40,300	39,500
15-----	27,500	29,600	13,600	37,000	19,600	48,500	62,900	168,000	59,600	63,700	34,000	42,800
16-----	26,000	29,100	11,900	34,100	19,600	47,300	68,100	158,000	58,800	62,300	33,400	46,100
17-----	24,500	29,600	11,500	30,500	17,800	44,800	75,900	146,000	60,300	57,000	33,400	43,400
18-----	22,500	29,100	11,500	33,100	17,800	44,200	74,900	147,000	76,000	55,600	32,700	40,800
19-----	22,000	28,000	11,600	51,800	18,700	47,900	74,900	150,000	86,000	56,000	29,500	54,500
20-----	22,000	27,000	11,100	50,500	21,500	43,600	71,300	132,000	86,000	57,400	27,900	59,600
21-----	22,000	26,000	10,700	49,800	22,500	37,700	57,100	117,000	83,000	54,500	25,300	56,200
22-----	22,000	24,500	11,500	85,800	26,500	38,300	49,600	114,000	78,000	51,000	23,700	49,500
23-----	22,000	23,500	16,100	74,000	36,500	38,300	50,300	123,000	76,000	50,300	23,700	46,100
24-----	21,500	22,500	54,600	60,200	41,200	39,400	50,300	132,000	73,000	53,100	24,800	49,600
25-----	22,000	22,500	85,800	59,300	46,700	47,300	51,000	132,000	71,200	49,600	31,300	49,600
26-----	23,500	21,500	73,000	54,600	43,000	52,700	56,000	144,000	67,700	48,200	40,100	45,500
27-----	25,000	20,000	74,000	51,100	40,100	54,900	54,500	153,000	67,700	46,100	39,100	44,100
28-----	25,000	19,600	95,500	49,200	39,500	64,000	51,700	156,000	71,200	44,800	34,900	42,800
29-----	24,000	19,200	87,000	51,100	-----	66,800	49,600	144,000	79,000	42,800	28,400	37,700
30-----	24,000	19,200	61,800	46,100	-----	85,800	47,500	123,000	87,000	41,400	29,000	48,200
31-----	24,500	-----	49,200	42,400	-----	110,000	-----	112,000	-----	40,100	36,500	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	33,600	21,500	25,200	1,550,000
November-----	30,800	19,200	25,500	1,520,000
December-----	93,500	10,700	31,500	1,940,000
January-----	85,800	29,100	44,400	2,730,000
February-----	46,700	15,600	30,800	1,710,000
March-----	110,000	37,700	52,900	3,250,000
April-----	115,000	47,500	77,400	4,610,000
May-----	178,000	46,100	110,000	6,760,000
June-----	126,000	58,800	82,900	4,930,000
July-----	108,000	40,100	65,300	4,020,000
August-----	40,800	23,700	28,500	2,060,000
September-----	59,600	26,900	41,000	2,440,000
The year-----	178,000	10,700	51,900	37,500,000

MISSOURI RIVER AT RUEGG, MO.

LOCATION.—Wire gage in T. 47 N., R. 7 E., at highway bridge 50 feet below Chicago, Burlington & Quincy Railroad bridge a quarter of a mile northeast of Ruegg and 8 miles above confluence with Mississippi River. Zero of gage is 399.24 feet above mean sea level.

DRAINAGE AREA.—529,000 square miles.

RECORDS AVAILABLE.—March to September 1933.

DISCHARGE.—Maximum during period, 187,000 second-feet May 14, 15; maximum gage height, 20.83 feet May 16; minimum discharge, 23,600 second-feet Aug. 24 (gage height, 4.7 feet).

Maximum stage known, 38.4 feet June 1844.

REMARKS.—Records good. Stage-discharge relation affected by backwater from Mississippi River. Discharge determined on basis of slope as obtained by use of auxiliary gages located at Halls Ferry, 10 miles upstream and at mouth of Missouri River. Gage-height record furnished by Corps of Engineers, United States Army.

Discharge, in second-feet, 1933

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		126,000	47,700	114,000	88,400	40,000	35,200
2		110,000	47,100	101,000	102,000	40,000	42,000
3		111,000	47,400	116,000	108,000	39,200	41,000
4		118,000	49,800	128,000	103,000	39,200	36,500
5		112,000	53,000	120,000	95,900	40,700	33,400
6		105,000	56,400	118,000	90,700	39,000	31,200
7		96,400	61,300	114,000	86,300	38,000	28,500
8		88,900	65,600	102,000	78,500	37,600	29,200
9		94,700	80,100	90,800	73,500	35,500	33,500
10		108,000	66,400	80,900	72,100	33,600	35,200
11		107,000	59,400	75,900	67,900	32,300	37,100
12		99,200	100,000	71,000	67,200	31,500	33,200
13		85,000	124,000	64,200	72,400	34,600	31,300
14		74,400	187,000	62,200	70,400	40,800	31,600
15		67,200	187,000	63,000	66,300	40,800	33,000
16		66,800	181,000	59,100	63,800	35,000	41,400
17		70,000	162,000	58,900	62,100	32,600	45,700
18		76,600	150,000	60,200	58,600	33,000	45,600
19		73,500	151,000	76,600	55,600	32,800	45,200
20		74,600	154,000	86,400	55,800	29,900	46,800
21		70,700	136,000	86,600	57,000	28,000	60,100
22		58,700	121,000	83,000	54,300	25,800	58,700
23		51,400	115,000	78,500	51,500	25,100	51,400
24	41,100	51,500	125,000	76,200	50,700	23,600	46,900
25	40,600	52,000	149,000	73,400	52,800	25,900	50,200
26	54,400	52,900	158,000	71,900	49,700	31,600	49,300
27	54,800	55,200	147,000	68,600	47,400	40,300	48,200
28	56,700	56,000	153,000	67,900	46,900	39,200	44,100
29	70,200	53,700	158,000	72,900	44,300	34,900	43,200
30	79,600	51,200	146,000	79,300	42,500	29,600	38,300
31	98,000		125,000		41,600	29,100	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 24-31	98,000	40,600	61,900	983,000
April	126,000	51,200	80,600	4,800,000
May	187,000	47,100	115,000	7,070,000
June	128,000	58,900	84,000	5,000,000
July	108,000	41,600	67,000	4,120,000
August	40,800	23,600	34,200	2,100,000
September	60,100	28,500	41,400	2,450,000
The period				26,500,000

GRASSHOPPER CREEK BASIN

GRASSHOPPER CREEK NEAR DILLON, MONT.

LOCATION.—Chain gage in NW¼ sec. 26, T. 8 S., R. 10 W., about 5 miles above Barratts and 14 miles southwest of Dillon.

DRAINAGE AREA.—360 square miles.

RECORDS AVAILABLE.—March 1921 to June 1933 (discontinued).

DISCHARGE.—Maximum during year, 170 second-feet June 10 (gage height, 5.36 feet); minimum not determined.

1921-33: Maximum, 557 second-feet June 5, 1925 (gage height, 6.52 feet); no flow July 5-11 and Aug. 3, 1930, Aug. 5-6, 1931. Water diverted for irrigation.

REMARKS.—Records fair except those for period of ice effect Dec. 6-14, which are poor. No record Jan. 1 to Mar. 5. Numerous small diversions above gage.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June
1.....	15	40	37	-----	78	74	107
2.....	15	44	30	-----	50	66	120
3.....	15	34	23	-----	107	86	129
4.....	15	28	a 30	-----	74	70	129
5.....	15	28	37	-----	66	70	134
6.....	15	a 32	20	22	52	70	139
7.....	17	37		22	40	70	148
8.....	23	34		19	42	66	139
9.....	24	44		21	45	52	153
10.....	26	28		22	22	52	170
11.....	34	30	15	22	27	31	134
12.....	37	54		25	33	31	134
13.....	34	a 41		25	33	29	129
14.....	32	28		31	31	27	134
15.....	32	37		31	59	25	139
16.....	32	40	15	31	86	29	120
17.....	32	44	15	29	98	86	107
18.....	32	57	15	29	94	66	94
19.....	32	50	15	29	86	38	82
20.....	34	a 45	15	31	59	33	74
21.....	34	40	15	33	52	59	63
22.....	34	32	16	27	70	63	49
23.....	34	32	17	22	78	90	31
24.....	37	40	19	a 25	82	82	22
25.....	37	44	a 19	a 27	78	49	21
26.....	37	44	19	29	82	35	19
27.....	37	37	17	38	78	27	17
28.....	40	32	19	49	70	49	15
29.....	37	37	20	98	82	a 54	33
30.....	a 40	40	20	86	82	59	78
31.....	44	-----	22	70	-----	86	-----
Month	Maximum		Minimum		Mean		Run-off in acre-feet
October.....	44		15		29.7		1,830
November.....	57		28		38.4		2,280
December.....	37		15		20.3		1,250
March.....	98		19		34.3		1,770
April.....	107		22		65.1		3,870
May.....	90		25		55.6		3,420
June.....	172		15		95.4		5,680

^a Interpolated.

RUBY RIVER BASIN

RUBY RIVER NEAR ALDER, MONT.

LOCATION.—Staff gage in SW $\frac{1}{4}$ sec. 21, T. 6 S., R. 4 W., 1,000 feet below highway bridge $1\frac{1}{2}$ miles south of Alder.

RECORDS AVAILABLE.—April 1929 to August 1933 (discontinued). Records obtained 1911–14 at Lauterbach's ranch, 8 miles south of Alder, not comparable with records for present site because of inflow and diversions between the two stations.

DISCHARGE.—Maximum during year, 586 second-feet June 3 (gage height, 2.76 feet); minimum, 4 second-feet Oct. 12–14.

1929–33: Maximum, 745 second-feet May 25, 1929 (gage height, 3.55 feet); minimum, that of Oct. 12–14, 1932.

REMARKS.—Records fair. Discharge not computed for period of ice effect, Dec. 9 to Mar. 11. Numerous diversions. No storage.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.
1.....	43	94	111	-----	84	208	512	61	38
2.....	40	106	111	-----	92	179	512	48	30
3.....	38	98	111	-----	100	163	586	40	40
4.....	33	102	111	-----	88	147	512	35	53
5.....	13	106	106	-----	84	163	421	38	40
6.....	10	118	98	-----	88	137	351	38	50
7.....	5	113	82	-----	92	122	301	40	56
8.....	6	109	113	-----	88	104	285	40	59
9.....	7	118	-----	-----	84	92	254	38	53
10.....	10	118	-----	-----	84	84	269	35	48
11.....	10	122	-----	-----	84	77	301	38	53
12.....	4	100	-----	118	84	66	254	35	61
13.....	4	118	-----	109	84	61	254	38	-----
14.....	4	118	-----	100	84	50	238	38	-----
15.....	11	113	-----	92	88	50	223	38	-----
16.....	10	113	-----	96	100	67	208	38	-----
17.....	13	122	-----	92	104	81	179	40	-----
18.....	18	122	-----	88	122	100	163	38	-----
19.....	16	127	-----	92	118	104	152	33	-----
20.....	23	122	-----	88	104	109	137	28	-----
21.....	39	115	-----	92	104	113	113	30	-----
22.....	36	115	-----	84	109	238	61	28	-----
23.....	32	111	-----	81	127	208	35	26	-----
24.....	49	106	-----	88	163	152	30	28	-----
25.....	63	111	-----	84	179	127	28	40	-----
26.....	76	111	-----	88	174	269	28	48	-----
27.....	82	111	-----	88	142	301	21	43	-----
28.....	76	106	-----	92	208	238	33	48	-----
29.....	72	106	-----	88	208	179	67	53	-----
30.....	94	106	-----	88	238	334	104	43	-----
31.....	98	-----	-----	84	-----	512	-----	40	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	98	4	33.4	2,050
November.....	127	94	112	6,660
December 1–8.....	113	82	105	1,670
March 12–31.....	118	81	91.6	3,630
April.....	238	84	117	6,960
May.....	512	50	156	9,590
June.....	586	21	221	13,200
July.....	61	26	38.8	2,390
August 1–12.....	61	30	48.4	1,150

BIG HOLE RIVER BASIN

BIG HOLE RIVER NEAR MELROSE, MONT.

LOCATION.—Water-stage recorder in SE¼ sec. 3, T. 4 S., R. 9 W., at highway bridge 8 miles south of Melrose.

RECORDS AVAILABLE.—October 1931 to September 1933. Comparable records 1½ miles upstream March 1924 to September 1931.

DISCHARGE.—Maximum during year, 8,550 second-feet June 5 (gage height, 5.95 feet); minimum, not determined, but occurred during ice period.

1924-33: Maximum, 9,230 second-feet May 26-27, 1928 (gage height, 7.60 feet, old site); minimum, 49 second-feet Aug. 17, 1931 (gage height, 0.70 foot, old site).

Maximum stage, 14.0 feet at old site (from high-water mark) June 10, 1927 (discharge not determined).

REMARKS.—Records good except those for period of ice effect, Dec. 10 to Mar. 22, and estimated period Sept. 8-15, which are fair. Staff gage used June 19-27. Several diversions above station. Flow partly regulated by power-plant operation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	294	349	383	245	235	435	373	2,620	5,160	2,720	341	303
2	286	401	369				365	2,230	6,120	2,340	337	294
3	278	407	407				361	2,120	7,250	1,800	341	294
4	275	392	397				365	1,920	8,030	1,470	337	289
5	278	383	373				369	1,870	8,290	1,270	341	283
6	280	416	323	195	240	410	373	1,780	8,030	1,160	337	278
7	303	407	215				383	1,630	8,030	1,060	330	267
8	341	397	229				401	1,470	7,510	1,000	320	
9	387	407	244				480	1,350	7,510	968	313	
10	387	387					530	1,350	8,030	937	303	
11	387	341		195	240	410	462	1,270	8,030	875	297	270
12	383	317					462	1,200	7,770	815	292	
13	383	421					393	1,090	7,510	732	278	
14	383	451					421	1,050	7,770	673	272	
15	383	392	165				462	1,090	7,250	633	264	
16	392	383		220	330	300	689	1,330	7,000	595	254	275
17	416	451					1,110	1,610	6,750	595	244	278
18	445	508					1,420	1,770	6,500	530	236	275
19	445	494					1,650	1,720	6,120	565	239	272
20	427	480					1,750	1,560	5,160	529	241	272
21	401	451		195	330	300	1,440	1,560	4,570	494	264	262
22	397	445					1,480	1,910	3,880	471	264	264
23	401	357					272	2,360	2,250	3,236	456	289
24	387	300					* 286	2,720	2,540	2,820	445	286
25	387	330					300	2,720	2,360	* 2,350	433	286
26	392	373	195	220	330	300	* 307	2,820	2,420	1,870	416	294
27	392	397					313	2,720	2,820	* 1,730	407	313
28	397	407					* 320	2,820	3,020	1,580	392	337
29	392	401					326	2,820	3,230	2,050	373	337
30	387	392					* 342	2,820	3,440	2,620	365	326
31	378						410		4,110		349	313

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	445	275	370	22,800
November	508	300	401	23,900
December	407		223	13,700
January			220	13,500
February			252	14,000
March		272	390	24,000
April	2,820	361	1,250	74,400
May	4,110	1,050	1,990	122,000
June	8,290	1,580	5,680	338,000
July	2,720	349	835	51,300
August	341	236	299	18,400
September	313	262	282	16,800
The year	8,290		1,010	733,000

* Interpolated.

SOUTH BOULDER CREEK BASIN

SOUTH BOULDER CREEK NEAR JEFFERSON ISLAND, MONT.

LOCATION.—Water-stage recorder in sec. 18, T. 2 S., R. 3 W., about 200 feet above headworks of Liberty-Montana Mines Co. and 16 miles southwest of Jefferson Island. Staff gage with different datum used Oct. 1, 1932, to May 10, 1933.

RECORDS AVAILABLE.—May 1926 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 305 second-feet June 10 (gage height, 2.84 feet); minimum not determined.

1926-33: Maximum, 434 second-feet June 16, 1929 (gage height, 3.50 feet); minimum, 2.0 second-feet Apr. 12, 1929 (gage height, 0.90 foot).

REMARKS.—Records poor Oct. 1 to May 10 and good thereafter. No diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	13.5	13.5	7.5	7.0	7	5	5	19	150	99	23	48	
2.....	13.5	13.5			7	5	5	23	170	93	23	43	
3.....	13.5	13.5			7	5	5	24	168	90	24	41	
4.....	13.5	13.5			7	5	5	25	168	87	22	39	
5.....	13.5	9.9			5	5	5	25	172	83	21	38	
6.....	13.5	9.0	7.0	7	5	5	5	26	187	80	21	36	
7.....	13.5	9.0			5	5	5	27	197	76	20	36	
8.....	13.5	9.0			5	5	5	24	180	79	19	34	
9.....	13.5	9.0			5	5	5	21	240	80	19	38	
10.....	13.5	9.0			5	5	5	21	260	72	19	34	
11.....	13.5	8.0	7.0	7	5	5	5	19	248	67	19	34	
12.....	13.5		7.0	7	5	5	5	19	251	64	19	33	
13.....	13.5		7.0	7	5	5	5	19	263	60	17	32	
14.....	13.5		7.0	7	5	5	5	21	248	58	17	32	
15.....	13.5		7.0	7	5	5	5	25	240	54	17	42	
16.....	13.5	8.0	7.0	5	5	5	7	28	234	51	17	31	
17.....	13.5		7.0	5	5	5	7	31	226	47	16	28	
18.....	13.5		7.0	5	5	5	7	30	202	42	16	27	
19.....	13.5			5	5	5	9	33	189	36	16	23	
20.....	13.5			5	5	5	9	44	170	32	22	26	
21.....	13.5	8.0		7.0	5	5	5	9	42	159	31	29	24
22.....	13.5				5	5	5	9	40	150	30	23	23
23.....	13.5		5		5	5	9	44	146	30	27	22	
24.....	13.5		5		5	5	9	56	134	29	30	23	
25.....	13.5		5		5	5	11	54	132	28	34	22	
26.....	13.5	8.0	7.0	5	5	5	11	57	126	27	54	24	
27.....	13.5			5	5	5	14	63	115	25	60	22	
28.....	13.5			5	5	5	14.6	57	124	24	58	24	
29.....	13.5			5	5	5	15.1	66	121	24	56	26	
30.....	13.5			5	5	5	18.4	88	108	24	54	22	
31.....	13.5			5	5	5	5	121	121	24	52	22	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	13.5	13.5	13.5	830
November.....	13.5		8.96	533
December.....			7.2	443
January.....		5	6.0	369
February.....	7	5	5.3	294
March.....	5	5	5.0	307
April.....	18.4	5	7.8	464
May.....	121	19	38.5	2,370
June.....	263	108	183	10,900
July.....	99	24	53.1	3,260
August.....	60	16	27.9	1,720
September.....	48	22	30.9	1,840
The year.....	263	5	32.2	23,300

WILLOW CREEK BASIN

WILLOW CREEK NEAR WILLOW CREEK, MONT.

LOCATION.—Wire gage in SW $\frac{1}{4}$ sec. 18, T. 1 S., R. 1 E., at highway bridge 7 miles south of Willow Creek.

DRAINAGE AREA.—164 square miles.

RECORDS AVAILABLE.—September 1919 to December 1932 (discontinued).

DISCHARGE.—1919-32: Maximum, 456 second-feet June 21, 22, 1922 (gage height, 3.50 feet); minimum, 3 second-feet Nov. 27, 1926 (gage height, 1.40 feet).

REMARKS.—Records good. Stage-discharge relation affected by ice Nov. 24. Numerous small diversions above and below station.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1	8.4	27	23	11	11.1	35	-----	21	24	23	-----
2	8.4	27	23	12	10.4	47	-----	22	24	* 27	-----
3	8.4	26	23	13	10.4	32	-----	23	26	31	-----
4	9.7	27	23	14	9.7	28	-----	24	26	28	-----
5	10.4	27	22	15	10.4	28	-----	25	26	24	-----
6	9.0	28	13.4	16	11.8	27	-----	26	23	29	-----
7	10.4	26	12.5	17	28	26	-----	27	23	27	-----
8	10.4	24	-----	18	26	26	-----	28	27	23	-----
9	9.7	* 26	-----	19	23	24	-----	29	24	24	-----
10	10.4	29	-----	20	24	23	-----	30	27	24	-----
								31	35		-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	35	8.4	17.7	1,090
November	47	23	27.4	1,630
December 1-7	23	12.5	19.9	276

* Interpolated.

MADISON RIVER BASIN

MADISON RIVER NEAR WEST YELLOWSTONE, MONT.

LOCATION.—Water-stage recorder a quarter of a mile upstream from Riverside ranger station and $1\frac{1}{2}$ miles east of West Yellowstone and west boundary of Yellowstone National Park.

DRAINAGE AREA.—419 square miles.

RECORDS AVAILABLE.—June 1913 to September 1933.

EXTREMES.—Maximum discharge during year, 1,160 second-feet June 2; maximum gage height, 2.98 feet Feb. 16, 17, during ice jam; minimum discharge (estimated), 100 second-feet Feb. 7 (gage height, 1.04 feet).

1913-33: Maximum discharge, 1,950 second-feet June 10, 1917; minimum, that of Feb. 7, 1933.

REMARKS.—Records good except those estimated, Oct. 2-8, 10-15, Dec. 10-24, Jan. 4, 8-13, 17, Feb. 2-4, 7-21, which are fair. No diversions or regulation. Gage observations furnished by officials of Yellowstone National Park.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	347	335	341	335	377	353	335	518	1,080	409	347	325
2		341	335	341		353	330	487	1,080	395	359	325
3		341	335	347	370	353	347	541	1,070	383	353	320
4		330	341	347		353	353	526	984	383	347	320
5	353	335	347	347	365	347	335	495	920	377	341	320
6		353	347	347	359	347	335	502	910	383	341	325
7		341	365	347		347	347	479	880	383	341	325
8		341	341			347	341	457	840	402	341	325
9	359	353	335			347	335	436	920	395	341	347
10		341		350	350	347	330	416	1,040	389	341	335
11		330				347	330	402	920	377	341	325
12	359	341	340			347	341	389	880	365	341	320
13		347				347	335	389	870	359	341	320
14		347		353		347	341	395	870	359	335	320
15		335		365		341	347	402	850	353	341	365
16	359	341		353		341	383	457	772	353	335	365
17	371	341		360		347	395	533	724	353	330	341
18	365	347		365		347	416	533	643	353	335	335
19	341	353		359	360	347	416	510	583	347	353	330
20	335	353		359		341	383	518	533	347	353	330
21	335	353	350	359		347	409	583	502	347	341	330
22	341	347		359	365	347	443	670	472	347	347	330
23	347	335		359	359	335	487	679	464	341	341	330
24	335	335		353	365	335	479	634	443	335	335	347
25	335	347	365	359	353	335	510	670	436	335	341	423
26	341	347	353	353	353	335	526	762	423	341	377	371
27	347	347	365	353	353	335	526	800	416	341	365	347
28	353	341	353	377	353	341	591	744	436	341	347	347
29	341	341	347	371		353	670	782	450	335	341	347
30	341	335	371	377		347	608	890	436	330	330	335
31	335		371	377		341		1,060		335	325	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October		335	350	0.835	0.96	21,500
November	353	330	342	.816	.91	20,400
December		335	348	.831	.96	21,400
January	377	335	356	.850	.98	21,900
February		353	358	.854	.89	19,900
March	353	335	345	.823	.95	21,200
April	670	330	411	.981	1.09	24,500
May	1,060	389	570	1.36	1.57	35,000
June	1,080	416	728	1.74	1.94	43,300
July	409	330	361	.862	.99	22,200
August	377	325	343	.819	.94	21,100
September	423	320	338	.807	.90	20,100
The year	1,080	320	404	.964	13.08	292,000

GALLATIN RIVER BASIN

GALLATIN RIVER NEAR GALLATIN GATEWAY, MONT.

LOCATION.—Water-stage recorder installed Oct. 20, 1932, at independent datum in NE¼ sec. 18, T. 4 S., R. 4 E., a quarter of a mile below mouth of Spanish Creek and 8 miles south of Gallatin Gateway. Prior to Oct. 19, 1932, wire gage half a mile downstream and set to different datum was used.

DRAINAGE AREA.—810 square miles.

RECORDS AVAILABLE.—August 1889 to June 1894; and June 1930 to September 1933.

DISCHARGE.—Maximum during year, 4,270 second-feet June 13 (gage height, 5.03 feet); minimum, 172 second-feet Dec. 8 (gage height, 0.74 foot).

1930-33: Maximum, 5,780 second-feet June 16, 1932 (gage height, 4.60 feet on former gage); minimum, that of Dec. 8, 1932.

REMARKS.—Records good except those for Nov. 1 to Mar. 31, which are poor. Stage-discharge relation affected by ice Jan. 18 to Mar. 13. One small diversion at station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jr'y	Aug.	Sept.
1	380	367	298	284	280	263	270	606	3,230	1,420	490	460
2	380	380	298	294	287	253	284	571	3,360	1,320	526	440
3	360	363	305	280	284	256	316	582	3,620	1,270	532	436
4	360	363	305	284	284	246	309	585	3,490	1,200	520	427
5	360	363	298	294	280	227	266	592	3,360	1,160	485	418
6	360	363	266	298	277	230	280	571	3,300	1,140	470	418
7	380	339	221	309	270	234	298	514	3,360	1,110	465	409
8	380	309	182	316	270	237	284	502	3,230	1,060	455	409
9	380	343	195	298	256	230	270	460	3,490	1,080	460	418
10	360	339	204	294	266	254	263	450	3,750	1,030	440	418
11	380	287	201	291	263	246	266	431	4,010	976	436	405
12	380	316	204	291	263	256	273	414	4,010	898	431	396
13	380	324	209	291	256	266	270	409	4,140	847	427	392
14	360	332	237	291	246	266	273	414	4,010	815	422	388
15	360	305	240	291	256	263	316	431	4,010	783	422	418
16	380	305	266	277	260	256	351	508	3,880	759	418	436
17	423	316	270	272	260	263	355	606	3,750	743	409	414
18	380	328	266	272	260	270	371	672	3,490	703	409	400
19	360	328	294	272	256	266	355	719	3,230	658	422	392
20	316	332	305	272	260	266	320	719	2,840	650	445	388
21	347	324	294	272	260	270	316	898	2,590	628	440	380
22	376	320	273	272	266	263	384	1,270	2,470	613	455	380
23	363	277	298	272	263	260	431	1,200	2,290	592	450	380
24	363	287	302	277	253	260	436	1,120	2,110	578	440	388
25	355	312	294	280	253	263	475	1,190	1,990	557	445	418
26	367	309	298	273	256	266	532	1,590	1,820	550	538	414
27	384	305	291	277	260	263	585	1,820	1,700	544	672	400
28	380	316	291	280	260	273	743	1,540	1,640	538	564	400
29	347	309	291	277	-----	284	799	1,540	1,820	526	526	^b 396
30	376	312	287	270	-----	273	751	2,110	1,590	514	502	^b 396
31	332	-----	287	273	-----	291	-----	2,840	-----	502	470	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	423	316	368	0.454	0.52	22,600
November	380	277	325	.401	.45	19,300
December	305	182	267	.330	.38	16,400
January	316	270	284	.351	.40	17,500
February	287	246	264	.326	.34	14,700
March	291	227	258	.319	.37	15,900
April	799	266	381	.470	.52	22,700
May	2,840	409	899	1.11	1.28	55,300
June	4,140	1,590	3,050	3.77	4.21	181,000
July	1,420	502	831	1.03	1.19	51,100
August	672	409	471	.581	.67	29,000
September	460	380	408	.504	.56	24,300
The year	4,140	182	650	.802	10.89	470,000

^a Interpolated.

^b Estimated.

GALLATIN RIVER AT LOGAN, MONT.

LOCATION.—Wire gage in sec. 26, T. 2 N., R. 2 E., at highway bridge half a mile west of Logan.

RECORDS AVAILABLE.—August 1928 to June 1933 (discontinued).

DISCHARGE.—Maximum during year, 3,700 second-feet June 13 (gage height, 5.94 feet); minimum, 245 second-feet Jan. 2.

1928-33: Maximum, 4,570 second-feet June 16, 1932, June 17, 1929 (gage height, 6.42 feet and 6.44 feet respectively); minimum, 153 second-feet July 24-25, 1931 (gage height, 2.24 feet).

REMARKS.—Records good except those during ice period Dec. 10 to Feb. 25, which are fair. No record Oct. 6-23. Numerous diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	460	758	790	305	460	560	610	1,270	3,130
2	485	828	790	245		610	560	1,120	3,340
3	460	828	828	305		665	585	1,120	3,580
4	460	790	790	305		665	610	1,250	3,390
5	485	* 809	758	* 566		* 638	560	* 1,290	3,130
6		828	585	828	435	610	* 573	1,330	2,700
7		790	560	758		585	585	1,350	2,970
8		790	510	695		585	585	1,160	2,670
9		865	415	665		638	560	* 1,100	2,700
10		865		665		638	560	1,030	3,100
11		725	390	665	470	638	560	945	* 3,240
12		790		665		838	560	828	3,300
13		905		665		865	535	790	3,700
14		865		665		790	535	758	3,360
15		865		* 575		695	535	* 774	3,190
16		828	440	485	435	665	610	790	2,940
17		865		510		695	638	905	2,880
18		865		510		* 680	725	945	2,730
19		945		585		665	695	988	2,450
20		865		610		638	665	988	2,170
21		865	390	665	470	638	638	1,030	1,680
22		828		695		610	638	1,450	1,170
23		790		695		585	665	1,520	988
24	725	758		665		585	790	1,450	828
25	725	790		665		585	865	1,350	828
26	725	790	390	560	585	585	945	1,450	638
27	725	790		535	560	585	1,030	* 1,670	560
28	725	790		510	560	610	1,270	1,970	510
29	725	790		535		610	1,250	1,590	460
30	758	828		585		610	1,390	1,770	438
31	790			610		610		2,820	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	945	725	823	49,000
December	828		487	30,000
January	828	245	580	35,700
February	585		464	25,800
March	865	560	644	39,600
April	1,390	555	711	42,300
May	2,820	758	1,250	76,900
June	3,700	438	2,300	137,000

* Interpolated.

PRICKLY PEAR CREEK BASIN

PRICKLY PEAR CREEK NEAR CLANCY, MONT.

LOCATION.—Staff gage in the SW $\frac{1}{4}$ sec. 34, T. 9 N., R. 3 W., a quarter of a mile below mouth of Lump Gulch Creek and $\frac{1}{4}$ miles north of Clancy.

DRAINAGE AREA.—178 square miles.

RECORDS AVAILABLE.—July 1910 to September 1916; July 1921 to August 1933 (discontinued). July 1908 to June 1909 comparable record at site 1 mile downstream.

DISCHARGE.—Maximum during year, 142 second-feet June 2 (gage height, 1.96 feet); minimum, not determined, probably occurred during ice-affected period.

1909-16, 1921-33: Maximum, 492 second-feet June 3, 1927 (gage height, 3.8 feet); minimum, 4.1 second-feet Aug. 12, 1932 (gage height, 0.49 foot).

REMARKS.—Records good except those for periods of ice effect, Dec. 6-28, Jan. 16 to Feb. 21, Mar. 5, which are fair. Numerous diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	18	21	18	19	19	18	19	42	112	36	14
2	18	21	18	20	19	18	21	46	126	34	14
3	16	21	18	21	19	18	22	55	119	31	14
4	15	21	18	18	24	17	21	53	126	27	15
5	15	20	19	18	26	18	21	47	119	27	15
6	15	20		18	32	18	21	47	97	27	14
7	17	19		18	24	17	24	44	97	24	14
8	17	19	15	19	17	17	26	42	90	24	15
9	19	19		18	16	25	19	42	78	24	17
10	19	18		18	15	19	19	41	75	23	16
11	18	18		18	15	24	18	39	67	22	14
12	19	18		18	15	23	19	39	59	21	14
13	18	19	16	18	15	19	19	39	56	18	
14	18	21		18	16	18	19	42	52	18	
15	18	20		18	15	18	25	45	47	18	
16	21	20		19	15	19	27	60	43	18	
17	22	21		19	16	19	26	71	43	19	
18	20	20	19	19	16	18	21	71	42	18	
19	19	21		19	17	18	22	66	40	17	
20	19	20		18	17	18	21	55	38	17	
21	19	19		17	18	18	23	65	38	16	
22	18	18		18	18	18	26	112	36	16	
23	18	19		19	17	18	29	84	35	16	
24	18	19		19	18	18	34	74	35	15	
25	18	18	27	19	17	18	37	75	35	15	
26	18	18		21	17	18	53	90	33	15	
27	18	20		26	17	18	57	84	30	14	
28	21	18		26	18	19	65	78	34	14	
29	22	19		24		21	60	78	42	13	
30	22	18	23	23		19	52	97	47	13	
31	22		20	21		22		126		14	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	22	15	18.6	1,140
November	21	18	19.4	1,150
December			20.1	1,240
January	26	17	19.5	1,190
February	32	15	18.1	1,010
March	25	17	18.9	1,160
April	65	18	28.9	1,720
May	126	39	62.9	3,870
June	126	30	63.0	3,750
July	36	13	20.1	1,240
August 1-12	17	14	14.6	347
The period				17,800

TENMILE CREEK NEAR RIMINI, MONT.

LOCATION.—Water-stage recorder in NE¼ sec. 20, T. 9 N., R. 5 W., at Moose Creek ranger station, 500 feet above mouth of Moose Creek and 3 miles north of Rimini.

DRAINAGE AREA.—34 square miles.

RECORDS AVAILABLE.—March 1915 to August 1933 (discontinued).

DISCHARGE.—Maximum during year, 258 second-feet May 31 (gage height, 2.06 feet); minimum, 0.1 second-foot Aug. 12 (gage height, 0.03 foot).

1915-33: Maximum, 948 second-feet May 15, 1917 (gage height, 4.87 feet); no flow at various times during 1928-29 and 1931.

REMARKS.—Records poor Oct. 1 to May 27, thereafter good. No record Oct. 1-4, Oct. 17 to Nov. 4, Nov. 8 to Apr. 1, Apr. 4-24. Discharges interpolated Oct. 6-9, Apr. 28 to May 7, May 9-16, 19, 21-24, and 26. Water supply for city of Helena diverted above station. Flow partly regulated by reservoir on tributary above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Apr.	May	June	July	Aug.
1.....	-----	-----	-----	34	215	9.5	0.4
2.....	-----	-----	9.1	33	201	7.9	.4
3.....	-----	-----	3.5	32	173	6.6	2.2
4.....	-----	-----	-----	31	165	4.3	1.0
5.....	0.3	0.2	-----	30	145	3.5	.4
6.....	.3	.2	-----	29	130	3.5	.4
7.....	.3	.1	-----	28	123	2.9	.4
8.....	.4	-----	-----	26	103	3.1	.4
9.....	.4	-----	-----	30	92	1.5	.3
10.....	.4	-----	-----	35	83	1.0	.3
11.....	.4	-----	-----	40	73	1.0	.2
12.....	.4	-----	-----	45	64	.8	.1
13.....	.4	-----	-----	50	41	.7	.1
14.....	.3	-----	-----	55	35	.7	.2
15.....	.3	-----	-----	60	31	.6	.2
16.....	.3	-----	-----	65	27	.6	-----
17.....	-----	-----	-----	70	24	.6	-----
18.....	-----	-----	-----	79	20	.6	-----
19.....	-----	-----	-----	80	17	.5	-----
20.....	-----	-----	-----	81	14.2	.4	-----
21.....	-----	-----	-----	86	11.5	.4	-----
22.....	-----	-----	-----	91	10.3	.4	-----
23.....	-----	-----	-----	97	9.1	.4	-----
24.....	-----	-----	-----	103	7.9	.4	-----
25.....	-----	-----	14.8	109	7.2	.4	-----
26.....	-----	-----	27	130	6.3	.4	-----
27.....	-----	-----	41	152	5.4	.4	-----
28.....	-----	-----	39	147	7.2	.3	-----
29.....	-----	-----	37	160	11.5	.3	-----
30.....	-----	-----	35	192	13.2	.3	-----
31.....	-----	-----	-----	215	-----	.3	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 5-16.....	0.4	0.3	0.35	8.3
May.....	215	26	77.9	4,790
June.....	215	5.4	62.4	3,710
July.....	9.5	.3	1.75	108
August 1-15.....	2.2	.1	.47	14

TENMILE CREEK NEAR HELENA, MONT.

LOCATION.—Water-stage recorder in SE¼ sec. 22, T. 10 N., R. 4 W., opposite Broadwater Hotel, near Helena.

DRAINAGE AREA.—103 square miles.

RECORDS AVAILABLE.—July 1908 to August 1933 (discontinued).

DISCHARGE.—Maximum during year, 250 second-feet May 31 to June 1 (gage height, 2.21 feet); no flow October 1–4.

1908–33: Maximum, 865 second-feet May 28, 1917, June 11, 1927; maximum gage height, 6.58 feet (old datum) June 11, 1927; no flow at times.

REMARKS.—Records good except those estimated, which are fair. Diversions for irrigation and Helena city water supply above station.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1.....	0	5.5	3.2	0.6	2.2	1.2	2.2	34	200	11	0.7
2.....	0	5.5	3.5	.5	2.5	1.2	2.5	37	194	8.6	.8
3.....	0	4.7	3.2	.6	2.8	1.2	4.7	55	180	6.3	.9
4.....	0	4.7	3.2	2.5	2.8	1.5	5.9	43	161	4.7	.8
5.....	1.2	3.9	3.5	3.0		1.5	3.9	43	143	3.2	.8
6.....	1.2	3.9	2.0	3.0		1.5	3.9	41	118	1.5	.6
7.....	2.0	3.9		3.0	2.8	1.2	5.1	33	111	.9	.4
8.....	2.8	4.7		3.0		1.5	3.5	33	94	.8	.3
9.....	3.0	4.7		3.0		1.5	2.8	30	81	.9	.3
10.....	3.0	5.1		3.0		1.5	2.5	34	66	.9	.4
11.....	3.0	5.5		2.8	2.8	1.5	2.8	31	58	.8	.7
12.....	3.5	5.5	.9	2.5	2.2	1.0	2.8	30	52	.6	.6
13.....	3.5	4.7		2.5	2.2	2.5	2.2	31	44	.2	.5
14.....	3.9	5.1		2.5	2.2	2.5	2.2	38	43		
15.....	3.9	5.1		2.2	2.2	2.5	4.7	52	40	.2	
16.....	3.9	5.1		2.0	2.0	2.5	7.5	61	37	.2	
17.....	3.9	4.7	.2	2.0	1.5	2.5	8.0	75	34	.2	
18.....	3.9	4.7	.2	2.2	1.5	2.5	8.0	77	32	.2	
19.....	3.9	4.7	.3	2.2	1.2	2.5	7.5	75	29	.2	
20.....	4.3	5.1	.4	2.5	1.2	2.5	6.7	73	25	.2	
21.....	4.3	5.5	.4	2.5	1.0	2.5	6.3	81	22	.2	
22.....	4.7	5.5	.4	2.5	1.0	2.5	8.6	127	18	.3	
23.....	5.1	5.5	.4	2.5	1.0	2.5	15	116	16	.3	
24.....	5.9	5.1	.4	2.5	1.0	2.5	18	108	12	.3	
25.....	6.3	4.7	.4	2.2	1.0	2.5	22	121	14	.3	
26.....	5.9	4.7	.4	2.2	1.2	2.5	26	155	12	.4	
27.....	5.9	4.7	.6	2.2	1.2	2.5	42	183	11	.6	
28.....	5.5	4.7	.6	2.0	1.2	2.8	55	158	10	.6	
29.....	5.1	4.3	.6	2.2		2.8	52	155	14	.5	
30.....	5.1	3.2	.6	2.2		2.8	40	190	17	.6	
31.....	5.1		.6	2.2		2.5		214		.6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	6.3	0	3.54	218
November.....	5.5	3.2	4.82	287
December.....	3.5	.2	1.10	68
January.....	3	.5	2.28	140
February.....		1.0	1.95	108
March.....	2.8	1.0	2.09	129
April.....	55	2.2	12.5	744
May.....	214	30	81.7	5,020
June.....	200	10	62.9	3,740
July.....	11	.2	1.5	92
August 1–13.....	.9	.3	.6	15
The period.....				10,600

LITTLE PRICKLY PEAR CREEK BASIN

LITTLE PRICKLY PEAR CREEK NEAR MARYSVILLE, MONT.

LOCATION.—Staff gage in SW¼ sec. 18, T. 12 N., R. 6 W., a quarter of a mile below mouth of Deadman Creek and 6 miles northwest of Marysville.

DRAINAGE AREA.—60 square miles.

RECORDS AVAILABLE.—May 1913 to December 1932 (discontinued); April to May 1913 at site a quarter of a mile upstream; May 1909 to December 1911 at site above mouth of Deadman Creek.

DISCHARGE.—1909-11, 1913-32: Maximum, 454 second-feet May 25 and 26, 1917 (gage height, 3.8 feet); minimum, 1.2 second-feet Mar. 7-13, 1911 (gage height, 2.28 feet, old gage).

REMARKS.—Records good. Some diversions.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1.....	10.4	8.0	7.3	11.....	6.6	8.0	-----	21.....	8.0	8.0	-----
2.....	7.3	8.0	7.3	12.....	6.6	8.0	-----	22.....	8.0	8.0	-----
3.....	7.3	8.0	7.3	13.....	5.9	8.0	-----	23.....	8.0	8.0	-----
4.....	7.3	8.0	7.3	14.....	5.9	8.0	-----	24.....	8.0	8.0	-----
5.....	7.3	8.0	7.3	15.....	7.3	8.0	-----	25.....	8.0	7.3	-----
6.....	7.3	8.0	7.3	16.....	8.0	8.0	-----	26.....	8.0	7.3	-----
7.....	7.3	8.0	7.3	17.....	8.0	8.0	-----	27.....	8.0	7.3	-----
8.....	7.3	8.0	-----	18.....	8.0	8.0	-----	28.....	8.0	7.3	-----
9.....	7.3	8.0	-----	19.....	8.0	8.0	-----	29.....	8.0	7.3	-----
10.....	7.3	8.0	-----	20.....	8.0	8.0	-----	30.....	8.0	7.3	-----
								31.....	8.0	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	10.4	5.9	7.63	469
November.....	8.0	7.3	7.86	468
December 1-7.....	7.3	7.3	7.30	101

MARIAS RIVER BASIN

MARIAS RIVER NEAR SHELBY, MONT.

LOCATION.—Water-stage recorder in sec. 20, T. 31 N., R. 2 W., at highway bridge 7 miles south of Shelby.

DRAINAGE AREA.—2,610 square miles.

RECORDS AVAILABLE.—April 1902 to January 1908; April 1911 to September 1933

DISCHARGE.—Maximum during year, 5,500 second-feet June 10 (gage height, 6.30 feet); minimum, 121 second-feet Nov. 13 (gage height, 1.85 feet).

1902-7, 1911-33: Maximum, 29,500 second-feet June 24, 1907 (gage height, 14.9 feet); minimum, 10 second-feet Aug. 20, 1919 (gage height, 1.50 feet).

REMARKS.—Records good except those for periods of ice effect, Dec. 24 to Jan. 1, Jan. 29 to Mar. 19, which are fair. No record Dec. 9-23, Jan. 2-28, Apr. 28 to May 3. Numerous diversions from tributaries. Flow partly regulated by storage in several reservoirs on tributaries.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	129	287	508	220	175		443		4,970	1,920	350	264
2	127	282	515				425		5,070	1,790	345	291
3	127	291	508				408		4,760	1,670	330	291
4	129	268	543				449	2,110	4,440	1,610	361	269
5	133	236	558				372	2,250	4,650	1,560	378	247
6	131	264	291		185		437	2,400	4,760	1,450	340	239
7	133	291	236				587	2,330	4,440	1,400	315	232
8	141	282	232			236	656	2,180	4,140	1,300	287	228
9	145	268				232	389	2,330	4,040	1,210	247	251
10	150	273				216	384	2,250	5,070	1,130	224	243
11	163	232			200	200	425	1,980	5,070	1,090	196	236
12	172	193				860	431	1,730	4,340	1,050	180	236
13	163	180				507	378	1,730	3,940	1,000	177	228
14	158	153				649	378	1,980	4,040	958	180	220
15	153	161				622	437	2,720	4,240	920	177	209
16	155	148			250	636	560	3,170	4,550	875	180	300
17	183	158				1,040	875	3,260	4,760	838	190	209
18	203	291				1,030	670	3,170	4,650	778	196	213
19	206	594				1,260	656	2,810	4,240	748	186	213
20	203	735				1,730	670	2,640	3,550	705	177	216
21	200	574			405	1,790	670	2,560	2,980	663	213	216
22	209	581				1,450	815	2,640	3,260	629	282	213
23	216	581				1,350	1,040	2,810	2,980	594	255	209
24	224	547	180			1,210	1,300	2,980	2,810	560	933	247
25	224	526	155			1,260	1,610	3,070	2,560	514	520	260
26	224	507	177		405	905	1,980	3,450	2,330	488	400	264
27	224	488	180			462	2,180	3,840	2,180	456	335	260
28	228	481	183			400		3,840	2,180	425	278	255
29	224	462	206	183		462		3,540	2,110	389	243	255
30	239	581	203	177		514		3,740	2,110	361	220	269
31	305		203	177		547		4,340		356	243	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	305	127	181	11,100
November	735	148	364	21,700
February			260	14,400
March 8-31	1,790	200	815	38,800
April 1-27	2,180	372	729	39,000
May 4-31	4,340	1,730	2,780	154,000
June	5,070	2,110	3,840	228,000
July	1,920	356	950	58,400
August	933	177	288	17,700
September	291	200	239	14,200

MARIAS RIVER NEAR BRINKMAN, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 21, T. 29 N., R. 8 E., 4 miles southwest of Brinkman post office. Zero of gage is 2,670.26 feet above mean sea level.

RECORDS AVAILABLE.—October 1921 to August 1933.

DISCHARGE.—Maximum during year, 5,800 second-feet June 11 (gage height, 6.21 feet); minimum, 100 second-feet Oct. 5 (gage height 2.07 feet).

1921-33: Maximum, 14,300 second-feet June 1, 1927 (gage height, 7.9 feet, present datum); minimum, 45 second-feet Feb. 7-9, 1932.

Maximum known stage, about 16.7 feet (present datum) during 1908 flood.

REMARKS.—Records good except those for periods of ice effect, Dec. 7-31, Mar. 20-28, which are poor. No record Jan. 1 to Mar. 19. Numerous diversions. Flow partly regulated by storage on tributaries.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.
1	110	218	402		560	2,540	4,460	2,350	387
2	107	233	626		581	2,030	5,180	2,080	382
3	111	264	658		538	1,830	5,300	1,980	363
4	108	268	560		487	1,880	5,060	1,890	358
5	102	268	588		501	2,050	4,820	1,720	349
6	102	268	285		493	2,350	5,060	1,660	354
7	108	251	285		457	2,540	5,060	1,560	382
8	113	240	282		463	2,540	4,820	1,450	358
9	119	273	265		567	2,440	4,460	1,380	336
10	119	278	268		581	2,440	4,340	2,940	315
11	123	249	275		457	2,440	5,300	1,140	296
12	128	241	275		397	2,260	5,550	1,070	275
13	130	205	278		402	1,930	4,940	1,030	246
14	139	407	262		428	1,810	4,340	987	217
15	146	417	252		423	1,830	4,340	937	
16	139	412	241		417	2,540	4,580	897	
17	135	345	238		468	3,250	4,820	840	
18	135	312	238		581	3,460	5,060	804	
19	137	268	232		776	3,460	5,060	759	
20	152	255	230	650	690	3,040	4,700	682	
21	171	259	230	674	658	2,940	4,000	634	
22	179	474	235	716	674	2,730	3,560	618	
23	179	987	238	658	716	2,830	3,400	596	
24	177	868	196	776	946	2,830	3,360	588	
25	179	850	190	674	1,270	3,140	3,250	581	
26	190	733	198	596	1,570	3,140	2,730	567	
27	196	690	205	519	1,930	3,460	2,440	538	
28	199	634	212	525	2,350	3,890	2,350	506	
29	199	574	202	567	2,830	4,000	2,350	468	
30	209	588	202	552	3,140	3,780	2,440	423	
31	215		212	596		3,890		402	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	215	102	147	9,040
November	987	218	411	24,500
December	658	190	292	18,000
March 20-31	776	519	625	14,900
April	3,140	397	878	52,200
May	4,000	1,810	2,750	169,000
June	5,550	2,350	4,240	252,000
July	2,940	402	1,100	67,600
August 1-14	387	217	330	9,160

JUDITH RIVER BASIN

JUDITH RIVER NEAR UTICA, MONT.

LOCATION.—Wire gage in NW¼ sec. 17, T. 13 N., R. 12 E., at bridge on Noel's ranch, 10 miles above Utica.

DRAINAGE AREA.—326 square miles.

RECORDS AVAILABLE.—October 1919 to March 1933.

DISCHARGE.—Maximum during year, 7.6 second-feet Oct. 1-11 (gage height, 1.52 feet); no flow Mar. 19-21.

1919-33: Maximum, 1,070 second-feet June 11, 1927 (gage height, 5.70 feet); no flow Mar. 19-21, 1933.

REMARKS.—Records fair. Several diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1-----	7.6	6.1	4.8	1.8	1.8	0.3	16-----	6.1	4.8	4.8	1.8	0.8	0.2
2-----	7.6	6.1	4.8	1.8	1.8	.3	17-----	6.1	4.8	4.8	1.8	.8	.2
3-----	7.6	6.1	4.8	1.8	1.8	.2	18-----	6.1	4.8	4.8	1.8	.8	.2
4-----	7.6	6.1	4.8	1.8	1.8	.2	19-----	6.1	4.8	4.1	1.8	.6	0
5-----	7.6	6.1	4.8	1.8	1.8	.2	20-----	6.1	4.8	4.1	1.8	.6	0
6-----	7.6	6.1	4.8	1.8	1.8	.2	21-----	6.1	4.8	4.1	1.8	.6	0
7-----	7.6	6.1	4.8	1.8	1.8	.2	22-----	6.1	4.8	3.4	1.8	.5	.2
8-----	7.6	6.1	4.8	1.8	1.8	.2	23-----	6.1	4.8	3.4	1.8	.5	.2
9-----	7.6	6.1	4.8	1.8	1.8	.2	24-----	6.1	4.8	3.4	1.8	.5	.2
10-----	7.6	5.4	4.8	1.8	1.8	.2	25-----	6.1	4.8	2.9	1.8	.3	.2
11-----	7.6	5.4	4.8	1.8	1.8	.2	26-----	6.1	4.8	2.9	1.8	.3	.3
12-----	6.8	5.4	4.8	1.8	1.3	.2	27-----	6.1	4.8	2.9	1.8	.3	.3
13-----	6.8	5.4	4.8	1.8	1.3	.2	28-----	6.1	4.8	2.9	1.8	.3	.3
14-----	6.1	4.8	4.8	1.8	1.3	.2	29-----	6.1	4.8	2.4	1.8	-----	.3
15-----	6.1	4.8	4.8	1.8	.8	.2	30-----	6.1	4.8	2.4	1.8	-----	.3
							31-----	6.1	-----	2.4	1.8	-----	.3

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	7.6	6.1	6.68	411
November-----	6.1	4.8	5.27	314
December-----	4.8	2.4	4.12	253
January-----	1.8	1.8	1.80	111
February-----	1.8	.3	1.12	62
March-----	.3	0	.21	13
The period-----				1,160

BIG SPRING CREEK NEAR LEWISTOWN, MONT.

LOCATION.—Staff gage in NE¼ sec. 5, T. 14 N., R. 19 E., at hgl way bridge half a mile below Big Springs and 5 miles southeast of Lewistown.

RECORDS AVAILABLE.—June 1932 to September 1933.

DISCHARGE.—1932-33: Maximum, 183 second-feet May 7, 1933 (gage height, 0.85 foot); minimum, 112 second-feet (discharge measured) Apr. 18, 1932 (gage height, 0.64 foot).

REMARKS.—Records fair. Discharge interpolated for days of no gage reading. Stage-discharge relation not affected by ice as flow is from springs half a mile upstream. Flow known to have but little variations.

Discharge, in second-feet, 1932-33

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.			
1932												
1.....	114	124	° 124	124	16.....	° 150	124	° 124	124			
2.....	116	124	124	124	17.....	148	° 124	124	124			
3.....	118	124	124	° 124	18.....	146	° 124	124	124			
4.....	120	° 124	124	124	19.....	144	124	124	124			
5.....	122	124	124	° 124	20.....	142	124	124	124			
6.....	° 124	124	124	124	21.....	140	124	° 124	124			
7.....	126	124	° 124	124	22.....	138	124	124	124			
8.....	128	124	124	124	23.....	136	124	124	° 124			
9.....	130	124	124	124	24.....	134	° 124	124	124			
10.....	132	124	124	124	25.....	132	124	124	124			
11.....	135	° 124	124	124	26.....	130	124	° 124	124			
12.....	138	124	° 124	124	27.....	128	124	124	124			
13.....	141	124	° 124	° 124	28.....	127	124	124	124			
14.....	144	124	124	124	29.....	126	124	124	124			
15.....	147	124	124	124	30.....	125	124	124	° 124			
					31.....		124	124	-----			
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1.....	124	° 129	126	127	° 124	124	124	131	° 143	143	143	143
2.....	124	129	126	128	124	124	124	133	145	° 143	° 143	143
3.....	124	129	° 126	128	124	124	124	135	147	143	143	143
4.....	124	128	° 126	128	° 124	° 124	124	138	° 150	143	° 143	143
5.....	124	128	126	129	124	124	124	° 140	147	143	141	° 143
6.....	124	128	° 126	° 129	124	124	° 124	° 143	145	143	140	143
7.....	124	127	126	129	124	124	124	° 183	° 143	° 143	139	° 143
8.....	° 124	127	126	128	124	124	° 124	° 179	143	143	138	143
9.....	125	127	126	128	124	124	124	° 179	143	° 143	137	143
10.....	° 126	126	126	127	124	124	124	172	143	143	° 136	143
11.....	126	° 126	126	127	124	° 124	124	° 164	143	143	136	143
12.....	125	° 126	126	127	124	124	124	170	143	143	° 136	143
13.....	125	126	126	126	124	124	124	° 175	143	143	° 136	° 143
14.....	124	126	126	° 126	124	124	124	° 179	° 143	° 143	136	143
15.....	° 124	° 126	126	126	124	124	° 124	174	143	143	136	143
6.....	125	128	° 126	126	124	124	124	169	143	143	136	° 143
17.....	126	° 129	126	126	124	° 124	125	° 164	° 143	° 143	136	143
18.....	128	129	126	126	124	124	125	161	° 143	143	136	° 143
19.....	° 129	° 129	126	126	124	124	125	159	143	143	° 136	° 146
20.....	129	128	126	126	124	124	125	° 157	143	143	138	146
21.....	129	127	126	° 126	124	° 124	126	° 157	° 143	143	° 140	146
22.....	129	° 126	° 126	126	124	124	° 126	154	° 143	° 143	141	146
23.....	129	127	126	126	124	124	126	152	143	143	142	146
24.....	129	128	126	126	124	124	126	° 150	143	143	143	° 146
25.....	° 129	° 129	126	126	144	° 124	126	148	° 143	° 143	° 143	147
26.....	129	128	126	126	° 124	124	126	147	143	143	143	148
27.....	° 129	128	126	126	124	° 124	126	146	143	143	143	149
28.....	129	127	° 126	126	124	124	126	145	143	° 143	143	° 150
29.....	129	127	126	° 126	-----	144	° 126	144	143	143	° 143	° 150
30.....	129	° 126	127	126	-----	° 124	128	° 143	° 143	143	° 143	150
31.....	129	-----	127	125	-----	124	-----	143	-----	143	143	-----

° Gage read.

Discharge, in second-feet, of Big Spring Creek near Lewistown, Mont., 1932-33—Con.

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1932				
June.....	150	114	133	7,910
July.....	124	124	124	7,620
August.....	124	124	124	7,620
September.....	124	124	124	7,380
The period.....				30,500
1932-33				
October.....	129	124	127	7,810
November.....	129	126	127	7,590
December.....	127	126	126	7,750
January.....	129	125	127	7,810
February.....	124	124	124	6,890
March.....	124	124	124	7,620
April.....	128	124	125	7,440
May.....	183	131	156	9,590
June.....	150	143	144	8,570
July.....	143	143	142	8,790
August.....	143	136	140	8,610
September.....	150	143	145	8,630
The year.....	183	124	131	97,100

MUSSELSHELL RIVER BASIN

MUSSELSHELL RIVER AT HARLOWTON, MONT.

LOCATION.—Chain gage in sec. 26, T. 8 N., R. 15 E., at highway bridge 1 mile south of Harlowton.

DRAINAGE AREA.—1,130 square miles.

RECORDS AVAILABLE.—July 1907 to August 1933.

DISCHARGE.—Maximum during year, 1,360 second-feet June 2, 3 (gage height, 5.00 feet); no flow Oct. 1–19, July 25 to Aug. 12.

1907–33: Maximum, 4,020 second-feet May 27, 1917 (gage height, 7.3 feet, present datum); no flow at times.

REMARKS.—Records good. Stage-discharge relation affected by ice Nov. 12–15. Discharge interpolated Nov. 16, 17. No record Dec. 6 to Mar. 30.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Apr.	May	June	July
1.....	0	13	39	112	437	1,110	38
2.....	0	16	37	90	362	1,260	25
3.....	0	23	37	92	350	1,260	24
4.....	0	35	39	110	398	1,110	23
5.....	0	28	39	77	450	1,060	22
6.....	0	26	-----	66	450	965	23
7.....	0	26	-----	72	522	870	21
8.....	0	27	-----	90	424	822	20
9.....	0	30	-----	72	424	685	21
10.....	0	30	-----	54	398	600	20
11.....	0	24	-----	63	398	561	18
12.....	0	23	-----	63	373	522	13
13.....	0	16	-----	58	311	486	11
14.....	0	20	-----	63	291	486	9.4
15.....	0	24	-----	67	301	424	5.6
16.....	0	28	-----	99	327	362	4.6
17.....	0	32	-----	201	398	311	2.2
18.....	0	36	-----	225	450	238	2.0
19.....	0	36	-----	221	522	193	4.2
20.....	6.3	35	-----	266	522	165	1.2
21.....	6.3	36	-----	165	522	140	.7
22.....	6.3	40	-----	137	600	109	.4
23.....	7.0	46	-----	165	730	84	.2
24.....	7.6	41	-----	286	730	71	.1
25.....	8.2	39	-----	327	642	63	0
26.....	9.4	37	-----	339	600	56	0
27.....	8.2	35	-----	362	822	46	0
28.....	7.0	35	-----	398	965	38	0
29.....	8.2	39	-----	450	870	37	0
30.....	9.4	41	-----	486	730	38	0
31.....	11	-----	-----	-----	822	-----	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	11	0	3.06	188
November.....	46	13	30.6	1,820
December 1–5.....	39	37	38.2	379
April.....	486	54	176	10,500
May.....	965	291	521	32,000
June.....	1,260	37	472	28,100
July.....	38	0	9.99	614

NOTE.—No flow Aug. 1–12, when station was temporarily discontinued.

BOX ELDER CREEK NEAR WINNETT, MONT.

LOCATION.—Wire gage near north quarter corner of sec. 3, T. 14 N., R. 28 E., on highway bridge a quarter of a mile above mouth of McDonald Creek and 9 miles east of Winnett.

RECORDS AVAILABLE.—June 1930 to December 1932 (discontinued).

DISCHARGE.—1930-32: Maximum, 4,740 second-feet June 8, 1932 (gage height, 9.30 feet); no flow at times.

REMARKS.—Records fair. Diversions for storage and irrigation on tributaries.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1-----	0	0.8	0.8	11-----	0	0	0	21-----	0.8	0	0
2-----	0	.8	.8	12-----	0	0	0	22-----	.8	0	0
3-----	0	.8	.8	13-----	0	0	0	23-----	.8	0	0
4-----	0	.8	.8	14-----	0	0	0	24-----	.8	.5	0
5-----	0	.8	.8	15-----	0	0	0	25-----	.8	.3	0
6-----	0	.8	.8	16-----	0	0	0	26-----	.8	.3	0
7-----	0	.8	.8	17-----	0	0	0	27-----	.8	.8	0
8-----	0	.8	0	18-----	0	0	0	28-----	.8	.8	0
9-----	0	.8	0	19-----	.8	0	0	29-----	.8	.8	0
10-----	0	0	0	20-----	.8	0	0	30-----	.8	.8	0
								31-----	.8		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	0.8	0	0.34	21
November-----	.8	0	.38	23
December-----	.8	0	.18	11

McDONALD CREEK AT WINNETT, MONT.

LOCATION.—Wire gage in NE¼ sec. 6, T. 14 N., R. 27 E., at highway bridge at Winnett.

RECORDS AVAILABLE.—April 1930 to December 1932 (discontinued).

DISCHARGE.—1930-32: Maximum, 562 second-feet June 9, 1932 (gage height, 20.40 feet); no flow at times.

REMARKS.—Records fair. Numerous diversions.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1-----	0	0.5	0.8	11-----	0.2	0.5	-----	21-----	0.5	0.8	-----
2-----	0	.5	.8	12-----	.2	.5	-----	22-----	.5	.8	-----
3-----	0	.5	.8	13-----	.2	.5	-----	23-----	.5	.8	-----
4-----	0	.5	.8	14-----	.2	.8	-----	24-----	.5	.8	-----
5-----	0	.5	.8	15-----	.2	.8	-----	25-----	.5	.8	-----
6-----	0	.5	-----	16-----	.2	.8	-----	26-----	.5	.8	-----
7-----	.2	.5	-----	17-----	.5	.8	-----	27-----	.5	.8	-----
8-----	.2	.5	-----	18-----	.5	.8	-----	28-----	.5	.8	-----
9-----	.2	.5	-----	19-----	.5	.8	-----	29-----	.5	.8	-----
10-----	.2	.5	-----	20-----	.5	.8	-----	30-----	.5	.8	-----
								31-----	.5	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	0.5	0	0.31	19
November-----	.8	.5	.67	40
December 1-5-----	.8	.8	.8	8

MILK RIVER BASIN

SOUTH FORK OF MILK RIVER NEAR INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NW¼ sec. 6, T. 1, R. 19 W. fourth meridian, 1 mile north of international boundary and 20 miles west of Milk River, Alberta.

DRAINAGE AREA.—433 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933. April 1905 to October 1930 at site 5 miles south of international boundary.

DISCHARGE.—Maximum during year, 495 second-feet Apr. 29 (gage height, 2.69 feet); minimum, 2 second-feet Aug. 17–19 (gage height, 0.90 foot).

1905–33: Maximum stage, 15.4 feet June 6, 1908 (discharge not determined); no flow at times during 1919 and 1931.

REMARKS.—Records good except those for period of ice effect Oct. 27–31, Mar. 1 to Apr. 26, which are fair. No records Nov. 1 to Feb. 28. Staff gage used Oct. 25–31, Mar. 1 to Apr. 19, July 10–22, Aug. 22 to Sept. 8, Sept. 24–28. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932–33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	5.8	15	39	238	178	92	5.8	18.0
2.....	5.8	17	39	227	178	70	7.2	16.6
3.....	5.8	18	37	227	171	59	8.7	15.3
4.....	5.8	17	37	265	161	54	11.9	14.6
5.....	5.8	18	41	294	152	46.8	11.9	13.9
6.....	5.8	20	49	315	155	41.7	11.9	11.9
7.....	6.3	16	43	306	149	40.0	10.6	10.6
8.....	7.9	12	40	265	134	37.4	9.3	10.0
9.....	10.0	11	36	298	125	32.2	8.1	12.6
10.....	10.0	11	37	364	134	16.0	7.2	12.6
11.....	11.7	11	46	302	178	13.9	6.3	13.9
12.....	11.7	15	53	220	158	12.6	4.9	13.9
13.....	12.4	25	55	209	125	11.2	3.6	13.9
14.....	13.8	46	63	213	114	10.0	3.0	13.2
15.....	13.1	55	73	273	106	8.7	2.2	10.6
16.....	12.4	63	87	346	99	15.6	2.2	8.7
17.....	14.5	65	105	324	96	22.5	2.0	8.1
18.....	13.1	65	119	290	96	21.6	2.0	8.1
19.....	12.4	65	131	269	94	17.3	2.0	8.1
20.....	11.0	67	136	242	87	14.6	3.3	7.6
21.....	11.0	55	172	220	80	13.2	4.0	6.7
22.....	11.0	52	206	220	78	12.6	3.6	6.3
23.....	11.7	47	242	209	78	13.2	4.0	8.7
24.....	11.0	40	277	205	76	13.2	16.6	9.0
25.....	15.9	32	312	198	70	12.6	16.6	9.3
26.....	15.2	37	347	202	63	11.9	16.6	10.0
27.....	14.0	39	417	209	59	10.0	17.3	12.6
28.....	15.0	41	422	209	63	7.6	18.0	11.9
29.....	16.0	41	447	188	83	6.7	22.5	12.6
30.....	15.0	40	298	174	99	6.3	24.3	11.9
31.....	15.0	37		171		5.8	18.9	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....		5.8	11.2	689
March.....	67	11	35.3	2,170
April.....	447	36	147	8,750
May.....	364	171	248	15,200
June.....	178	59	115	6,840
July.....	92	5.8	24.2	1,490
August.....	24.3	2.0	9.24	568
September.....	18.0	6.3	11.4	673

• Interpolated.

MILK RIVER AT MILK RIVER, ALBERTA

(International gaging station)

LOCATION.—Water-stage recorder in SE¼ sec. 28, T. 2, R. 16 W. fourth meridian, at Milk River, Alberta.

DRAINAGE AREA.—1,104 square miles.

RECORDS AVAILABLE.—July 1909 to September 1917; October 1920 to September 1933. July 1909 to October 1920 station maintained by Department of the Interior, Canada.

DISCHARGE.—Maximum during year, 1,330 second-feet Apr. 24 (gage height, 4.16 feet); minimum, 1.5 second-feet Dec. 12 and Feb. 8.

1909-33: Maximum, 7,460 second-feet May 22, 1927 (gage height, 11.41 feet); no flow at times during 1922, 1923, and 1927.

REMARKS.—Records good except those for period of ice effect, Oct. 27 to Apr. 15, which are fair. Staff gage used Nov. 16 to Mar. 17. Flow increased by water from St. Mary Canal during irrigation season. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydro-metric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	24.5	70	24.5	7.5	18.8	51	273	385	658	767	626	576
2-----	24.5	55	20.7	7.5	20.7	53	382	325	658	744	631	565
3-----	24.5	48.7	20.7	10.5	20.7	55	447	443	653	704	636	554
4-----	24.5	53	18.8	6.0	20.7	58	339	614	658	692	658	538
5-----	20.7	30.2	16.9	7.5	13.5	60	214	715	636	675	658	532
6-----	22.6	24.5	13.5	6.0	7.5	62	286	827	636	670	664	527
7-----	22.6	42.4	12.0	7.5	3.0	60	537	864	648	675	653	538
8-----	26.4	34.0	7.5	6.0	1.5	58	466	821	642	681	653	538
9-----	24.5	32.1	4.5	7.5	6.0	55	256	809	631	670	658	538
10-----	30.2	48.7	4.5	9.0	9.0	60	146	922	511	670	648	554
11-----	30.2	20.7	2.0	10.5	9.0	65	190	908	312	670	636	560
12-----	34.0	32.1	1.5	12.0	12.0	75	180	791	549	653	631	554
13-----	36.1	22.6	4.5	15.0	12.0	94	161	744	658	653	642	554
14-----	32.1	16.9	7.5	16.9	12.0	130	183	738	614	653	560	554
15-----	30.2	32.1	9.0	16.9	9.0	183	268	773	604	664	609	527
16-----	30.2	36.1	10.5	15.0	7.5	234	376	852	604	664	642	256
17-----	32.1	38.2	10.5	12.0	15.0	275	464	877	604	664	636	202
18-----	34.0	38.2	13.5	9.0	16.9	396	260	858	626	664	636	135
19-----	32.1	38.1	13.5	7.5	18.8	409	273	852	636	658	636	88
20-----	32.1	38.1	12.0	7.5	24.5	438	294	791	653	658	642	61
21-----	30.2	36.1	13.5	7.5	30.2	330	334	750	653	642	648	52
22-----	30.2	36.1	13.5	7.5	34.0	228	414	738	675	631	648	44.2
23-----	102	36.1	12.0	7.5	36.1	196	779	738	681	626	658	38.5
24-----	139	36.1	13.5	7.5	38.2	180	1,130	715	681	620	692	36.6
25-----	124	36.1	15.0	7.5	42.4	193	1,100	715	704	626	710	36.6
26-----	78	36.1	15.0	10.5	44.5	210	845	704	721	626	687	34.7
27-----	53	34.0	13.5	10.5	46.6	220	664	692	733	626	631	34.7
28-----	58	34.0	13.5	10.5	51	279	587	698	738	620	598	34.7
29-----	62	32.1	9.0	12.0	-----	238	592	687	797	620	587	32.8
30-----	70	28.2	9.0	13.5	-----	294	532	664	791	620	582	30.9
31-----	42.0	-----	9.0	16.9	-----	433	-----	653	-----	626	587	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	139	20.7	43.8	2,690
November-----	70	16.9	36.6	2,180
December-----	24.5	1.5	11.8	726
January-----	16.9	6.0	9.96	612
February-----	51	1.5	20.8	1,160
March-----	438	51	183	11,300
April-----	1,130	146	432	25,700
May-----	922	325	731	44,900
June-----	797	312	646	38,400
July-----	767	620	659	40,500
August-----	710	560	638	39,200
September-----	576	30.9	311	18,500
The year-----	1,130	1.5	312	226,000

MILK RIVER AT EASTERN CROSSING OF INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NE¼ sec. 6, T. 37 N., R. 9 E., at eastern crossing of international boundary, 30 miles north of Rudyard, Mont., and 37 miles south of Many Berries, Alberta. Zero of gage, 2,698.92 feet above mean sea level.

DRAINAGE AREA.—2,514 square miles.

RECORDS AVAILABLE.—August 1909 to September 1933. From August 1909 to November 1912 maintained by Irrigation Branch, Department of the Interior, Canada.

DISCHARGE.—Maximum during year, 1,820 second-feet Apr. 25 (gage height, 3.69 feet); no flow Mar. 1-10.

1909-33: Maximum, 12,000 second-feet May 23, 1927 (gage height, 10.16 feet); no flow at times in 1914, 1922, 1923, and 1933.

REMARKS.—Records good except those for period of ice effect Mar. 1-19, which are fair. Staff gage used Mar. 7 to Apr. 15, Sept. 23-30. No record Nov. 1 to Feb. 28. No diversions. Flow increased by water from St. Mary Canal during irrigation season. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	39.6	0	316	772	655	661	553	463
2.....	38.0	0	435	690	638	655	538	473
3.....	38.0	0	446	568	650	622	512	468
4.....	38.0	0	458	488	661	627	522	473
5.....	38.0	0	502	527	644	579	553	478
6.....	36.8	0	370	798	633	579	590	473
7.....	36.8	0	484	1,270	633	579	548	468
8.....	36.8	0	600	1,130	627	584	538	468
9.....	37.4	0	714	933	616	579	574	468
10.....	35.6	0	522	856	611	568	553	483
11.....	36.2	15.6	409	841	584	563	527	488
12.....	39.6	36.2	295	894	579	574	522	473
13.....	36.8	36.6	278	856	538	595	563	492
14.....	35.0	36.8	362	739	492	595	590	502
15.....	35.6	71	463	702	605	563	600	502
16.....	35.0	635	522	739	584	563	590	483
17.....	34.4	656	644	886	568	558	512	502
18.....	33.8	863	684	886	574	590	584	527
19.....	33.8	713	765	933	579	579	584	426
20.....	33.8	574	548	886	605	538	568	254
21.....	33.8	958	463	827	584	517	590	172
22.....	33.8	910	563	827	600	532	605	138
23.....	33.8	870	644	778	684	522	553	103
24.....	34.4	309	958	765	720	527	568	88
25.....	34.4	212	1,520	708	702	527	638	74
26.....	34.4	180	1,400	661	633	527	563	73
27.....	42.0	195	1,230	678	627	543	517	68
28.....	74	208	975	726	672	563	512	63
29.....	69	220	812	655	933	563	483	56
30.....	52	261	752	666	672	563	468	56
31.....	47.0	274	-----	666	-----	538	463	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	74	33.8	39.3	2,420
March.....	958	0	266	16,400
April.....	1,520	278	638	39,000
May.....	1,270	488	786	48,300
June.....	933	492	630	37,500
July.....	661	517	570	35,000
August.....	638	463	551	33,900
September.....	527	56	342	20,400

* Interpolated.

MILK RIVER NEAR VANDALIA, MONT.

LOCATION.—Staff gage in NE¼ sec. 7, T. 30 N., R. 37 E., just below Vandalia Dam and 2 miles west of Vandalia.

RECORDS AVAILABLE.—May 1915 to September 1920; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,550 second-feet Aug. 26 (gage height, 25.22 feet); minimum, 3 second-feet Aug. 20 (gage height, 3.34 feet).

1915-20, 1928-33: Maximum, 25,200 second-feet Apr. 11, 1917 (gage height, 34.5 feet); no flow Aug. 9-13, 1910, June 5, 1919, Sept. 4, 7-16, 1929.

REMARKS.—Records fair. Numerous diversions from river and tributaries above station, including Vandalia Canal, which diverts at dam above gage. Some regulation at Vandalia Dam and some storage in Nelson Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	108	35	95	56	43	378	1,590	905	640	304	56	1,090
2.....	108	35	95	60	39	498	1,220	1,200	422	340	56	905
3.....	108	35	95	71	33	576	800	1,220	498	340	56	870
4.....	108	35	99	75	42	445	640	1,150	576	340	56	870
5.....	108	35	112	77	54	250	498	1,090	600	835	56	552
6.....	108	35	112	79	35	200	525	800	576	680	54	340
7.....	108	35	93	83		165	600	835	552	285	54	278
8.....	108	303	87	85		174	600	680	445	216	56	278
9.....	108	268	87	89		422	498	525	422	206	58	278
10.....	108	142	87	91		340	321	498	285	142	58	177
11.....	108	119	87	93	35	268	268	498	233	91	60	91
12.....	108	93	87	97		250	268	576	168	81	63	91
13.....	108	91	87	99		35	250	268	1,000	58	71	65
14.....	108	95	87	103		32	285	233	1,120	56	71	42
15.....	108	131	87	121		36	340	203	1,300	56	73	25
16.....	112	126	77	126	103	303	206	1,280	54	73	27	257
17.....	112	137	81	112	29	268	190	1,220	53	69	27	370
18.....	69	137	81	114	28	250	216	1,200	53	54	29	347
19.....	35	137	77	97	26	321	216	1,180	48	42	13	324
20.....	49	159	63	53	21	445	206	835	38	42	3	285
21.....	67	233	65	48	25	600	180	680	36	39	48	250
22.....	67	183	67	40	28	445	200	835	38	40	1,790	250
23.....	69	140	63	42	33	472	203	1,200	40	40	2,250	250
24.....	121	117	67	42	30	472	39	1,910	40	40	2,030	250
25.....	183	105	69	42	31	445	29	1,420	40	42	4,570	250
26.....	183	99	71	42	38	378	29	1,480	48	43	7,370	250
27.....	35	95	69	42	53	552	285	1,480	48	45	6,570	250
28.....	35	95	69	42	108	1,090	472	1,350	103	48	4,290	242
29.....	35	95	69	42	-----	1,320	216	1,090	200	48	1,650	242
30.....	35	95	71	42	-----	1,560	171	970	268	48	1,360	236
31.....	35	-----	65	42	-----	1,560	-----	835	-----	56	1,220	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	183	35	92.3	5,680
November.....	303	35	115	6,840
December.....	112	63	81.3	5,000
January.....	126	40	72.5	4,460
February.....	108	21	39.2	2,200
March.....	1,560	165	494	30,400
April.....	1,590	29	380	22,600
May.....	1,910	498	1,040	64,000
June.....	640	36	223	13,300
July.....	835	39	156	9,590
August.....	7,370	3	1,100	67,600
September.....	1,090	91	344	20,500
The year.....	7,370	3	349	252,000

NORTH FORK OF MILK RIVER ABOVE ST. MARY CANAL, NEAR BROWNING, MONT.

(International gaging station)

LOCATION.—Water-stage recorder in SW¼ sec. 16, T. 37 N., R. 11 W., about 1¼ miles above outlet of canal, 3 miles south of international boundary, and 30 miles north of Browning.

DRAINAGE AREA.—62 square miles.

RECORDS AVAILABLE.—June 1921 to September 1933; May 1911 to July 1912 at a site 1 mile below present gage. Records obtained at this station only during period when the St. Mary Canal is in operation.

DISCHARGE.—Maximum during year, 75 second-feet Apr. 27 (gage height, 1.36 feet); minimum, 2.5 second-feet Aug. 12 (gage height, 0.35 foot).

1911–12, 1921–33: Maximum, 363 second-feet May 29, 1927 (gage height, 4.93 feet); minimum, that of Aug. 12, 1933.

REMARKS.—Records good. No record Oct. 1 to Apr. 30. No diversions or regulation. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1-----	37.0	17.9	10.4	6.9	9.2	16-----	40.3	20.3	7.5	5.2	6.9
2-----	39.6	20.9	10.4	7.5	9.2	17-----	41.0	18.5	6.9	4.6	7.5
3-----	38.3	23.9	9.2	9.2	8.0	18-----	42.5	17.9	6.3	4.6	8.0
4-----	40.3	26.3	9.2	8.6	6.9	19-----	43.2	16.2	6.9	4.6	8.0
5-----	42.5	26.9	9.8	8.0	8.0	20-----	45.5	15.0	6.9	4.6	8.0
6-----	48.6	28.1	9.2	6.3	8.6	21-----	46.2	14.4	6.9	6.9	7.5
7-----	42.5	28.1	9.2	5.2	9.2	22-----	42.5	11.5	7.5	6.9	8.0
8-----	38.3	28.1	8.6	5.2	8.6	23-----	36.3	10.9	6.9	6.9	8.6
9-----	46.2	28.1	8.0	4.6	9.2	24-----	29.4	10.4	6.9	14.4	9.2
10-----	43.2	27.5	9.2	4.1	9.2	25-----	23.3	10.4	5.7	14.4	9.8
11-----	37.0	26.9	9.2	3.0	8.6	26-----	19.1	10.4	5.7	9.8	9.8
12-----	35.7	26.3	8.0	3.5	8.0	27-----	16.7	9.2	5.7	7.5	9.8
13-----	37.0	24.5	8.0	3.5	8.0	28-----	13.3	12.7	5.7	7.5	9.8
14-----	44.7	23.3	8.6	4.1	7.5	29-----	13.8	18.5	5.7	7.5	9.2
15-----	45.5	21.5	8.0	4.6	7.5	30-----	15.6	12.7	6.3	8.0	9.2
						31-----	14.4	-----	6.9	9.8	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May-----	48.6	13.3	35.5	2,180
June-----	28.1	9.2	19.6	1,170
July-----	10.4	5.7	7.72	475
August-----	14.4	3.0	6.69	411
September-----	9.8	6.9	8.50	506
The period-----	-----	-----	-----	4,740

NORTH FORK OF MILK RIVER NEAR INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NE¼ sec. 11, T. 1, R. 23 W. fourth meridian, about 2 miles north of international boundary and 18 miles east of Kimball, Alberta.

DRAINAGE AREA.—101 square miles.

RECORDS AVAILABLE.—January 1913 to September 1933. July 1909 to December 1912 at station in NE¼ sec. 13, T. 1, R. 23 W. fourth meridian, about 2 miles downstream.

DISCHARGE.—Maximum during year, 661 second-feet June 28 and Aug. 24 (gage height, 4.01 feet); minimum, 7.7 second-feet Sept. 28 (gage height, 1.71 feet).

1909-33: Maximum, 1,070 second-feet May 8, 1920 (gage height, 4.14 feet); minimum, 3.2 second-feet Mar. 1, 1927.

REMARKS.—Records good except those for period of ice effect, Oct. 31, Mar. 1 to Apr. 12, which are fair. Staff gage used Mar. 1-18, 21. No records Nov. 1 to Feb. 28. No diversions. Flow increased by discharge of St. Mary Canal during irrigation season. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	11.2	20	48.0	58	468	626	634	517
2.....	11.6		48.0	239	464	61°	634	517
3.....	11.6		48.0	329	464	61°	641	517
4.....	12.0		49.0	397	464	614	641	517
5.....	12.4		50.0	464	464	614	641	510
6.....	12.8	18	51	494	460	618	634	513
7.....	13.2		52	483	464	618	634	513
8.....	13.6		55	479	468	614	634	517
9.....	13.6		55	517	293	614	634	517
10.....	13.6		55	510	95	622	634	521
11.....	13.6	15	57	487	431	614	634	510
12.....	14.0		58	483	494	614	630	513
13.....	13.6		44.6	487	494	610	544	510
14.....	12.4		46.8	491	506	614	610	510
15.....	12.4		66	483	517	618	630	427
16.....	12.8	14	88	479	525	626	630	144
17.....	12.4		40.2	483	540	624	634	44.6
18.....	12.8		61	479	560	624	634	29.0
19.....	13.2		46.8	487	579	624	634	17.4
20.....	13.2		43.5	475	595	626	626	16.7
21.....	91	13	60	475	598	626	630	15.2
22.....	101	15	147	479	610	626	630	13.1
23.....	94	19	250	475	610	626	634	13.1
24.....	31.0	22	278	472	618	626	653	9.7
25.....	20.8	27	161	472	626	626	626	9.7
26.....	20.8	30	88	475	634	650	563	9.7
27.....	52	35	77	468	626	620	529	9.0
28.....	40.4	39	79	468	641	624	521	8.4
29.....	31.0	42	52	472	649	624	521	8.4
30.....	27.2	47	44.6	475	630	650	529	8.4
31.....	27.5	47	-----	475	-----	624	521	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	101	11.2	25.6	1,570
March.....	-----	-----	21.6	1,330
April.....	278	40.2	76.7	4,560
May.....	517	58	452	27,800
June.....	649	95	520	30,900
July.....	634	610	623	38,300
August.....	653	521	610	37,500
September.....	521	8.4	266	15,800

LODGE CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in SE¼ sec. 12, T. 1, R. 29 W. third meridian, in Saskatchewan, 1 mile north of international boundary and 30 miles north-west of Havre, Mont.

DRAINAGE AREA.—797 square miles.

RECORDS AVAILABLE.—April 1910 to September 1933. Prior to 1917 maintained by Irrigation Branch, Department of the Interior, Canada.

DISCHARGE.—Maximum during year, 459 second-feet Mar. 20 (gage height, 4.88 feet); no flow at times.

1917-33: Maximum, 3,680 second-feet May 23, 1927 (gage height, 12.40 feet); no flow at times usually after July 15 each year.

REMARKS.—Records good except those for period of ice effect Mar. 15 to 23, which are fair. Staff gage used Mar. 30 to Apr. 1. No records Nov. 1 to Feb. 28. Several diversions above gage. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	76	21.0	9.0	2.8	0	0
2	0	63	24.6	6.2	124	0	0
3	0	39.6	38.2	4.9	58	0	0
4	0	36.1	29.8	3.8	29.8	0	0
5	0	28.4	29.1	3.2	17.0	0	0
6	0	21.6	30.5	2.7	10.6	0	0
7	0	17.5	25.8	2.1	6.8	0	0
8	0	13.7	296	1.4	4.6	0	0
9	0	13.7	296	1.3	4.3	0	0
10	0	9.8	100	1.1	4.6	0	.4
11	0	8.2	62	.9	3.0	0	.1
12	0	7.1	54	.7	1.6	0	0
13	0	5.5	36.1	.6	1.2	0	0
14	0	6.8	25.8	.5	.9	0	0
15	85	5.2	19.5	.4	.7	0	0
16	248	4.3	16.0	.3	.5	0	0
17	274	99	14.2	.3	.4	0	0
18	293	114	12.8	.2	.3	0	0
19	334	127	11.4	.1	.2	0	0
20	388	106	9.8	.1	.2	0	0
21	345	79	9.0	.1	.1	0	0
22	288	55	8.6	0	.1	2.8	0
23	234	44.6	23.2	0	0	3.5	0
24	138	37.5	117	0	0	.5	0
25	81	37.5	59	0	0	.4	0
26	60	37.5	29.8	0	0	.3	0
27	42.8	32.6	41.0	0	0	.2	0
28	31.9	29.1	27.0	0	0	.1	0
29	32.6	30.5	19.0	8.6	0	0	0
30	62	25.8	14.6	244	0	0	0
31	81		11.4		0	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	388	0	97.4	5,990
April	127	4.3	40.4	2,400
May	296	8.6	42.4	2,610
June	244	0	9.75	580
July	248	0	16.7	1,030
August	3.5	0	.25	15
September	.4	0	.02	1

NOTE.—No flow during October.

McRAE COULEE AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NW¼ sec. 5, T. 1, R. 23 W. third meridian, a quarter of a mile above mouth and three-quarters of a mile north of international boundary, in Saskatchewan.

DRAINAGE AREA.—53 square miles.

RECORDS AVAILABLE.—March 1927 to September 1933.

DISCHARGE.—Maximum during year, 4 second-feet June 29 (gage height, 1.88 feet); no flow during most of year.

1927-33: Maximum, 486 second-feet May 23, 1927 (gage height, 5.74 feet); no flow at various times.

REMARKS.—Records fair. No regulation or diversion. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33: June 29, 0.8; Aug. 22, 2.6; Sept. 10, 2.6; Sept. 11, 1.2. No flow during year ending Sept. 30, 1933, except on days given above.

Run-off in acre-feet for June, 1.6; August, 5.2; September, 7.5; the year, 14.

NORTH CHINOOK CANAL NEAR HAVRE, MONT.

LOCATION.—Water-stage recorder in SE¼ sec. 2, T. 35 N., R. 17 E., 1 mile below headworks of canal and 23 miles northeast of Havre.

RECORDS AVAILABLE.—May 1928 to September 1933.

REMARKS.—Records good. Staff gage used July 1-7, 14-16, Aug. 22-26, 31. Canal diverts flood water from Lodge Creek in sec. 3, T. 35 N., R. 17 E., and stores it in North Chinook Reservoir for irrigation of lands between Lodge Creek and Battle Creek, north of Chinook.

Discharge, in second-feet, 1932-33

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1-----	0	47	35	16.1	0	0	16-----	0	6.5	29	0.03	0	0
2-----	0	51	31	12	50	0	17-----	0	4.8	24	0	0	0
3-----	0	46	25	7.6	44	0	18-----	34	16.1	20	0	0	0
4-----	0	42	29	4.8	54	0	19-----	37	54	16.8	0	0	0
5-----	0	36	35	6.1	44	0	20-----	48	56	15.0	0	0	0
6-----	0	35	30	4.9	35.9	0	21-----	50	56	11.8	0	0	0
7-----	0	29	31	2.9	26.6	0	22-----	50	50	10.2	0	0	15.7
8-----	0	24	31	2.0	19.4	0	23-----	48	44	8.9	0	0	18.0
9-----	0	20	29	1.5	15.5	0	24-----	48	54	6.3	0	0	6.9
10-----	0	16.1	47	1.1	9.2	0	25-----	40	46	26	0	0	.9
11-----	0	13.6	40	.8	5.8	0	26-----	39	41	37	0	0	1.4
12-----	0	14.0	36	.5	4.2	0	27-----	56	40	34	0	0	1.0
13-----	0	10.6	36	.3	1.0	0	28-----	41	39	32	0	0	1.4
14-----	0	9.7	34	.3	.2	0	29-----	30	36	33	0	0	1.8
15-----	0	8.4	33	.2	.1	0	30-----	22	35	27	0	0	1.0
							31-----	27	-----	20	-----	0	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March-----	56	0	18.4	1,130
April-----	56	4.8	32.7	1,950
May-----	47	6.3	27.5	1,630
June-----	16.1	0	2.04	121
July-----	54	0	10.0	615
August-----	18	0	1.55	95
The year-----				5,600

NOTE.—No flow during months omitted.

BATTLE CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in SE¼ sec. 4, T. 1, R. 26 W. third meridian, in Saskatchewan, a quarter of a mile above international boundary and 35 miles north of Chinook, Mont.

DRAINAGE AREA.—726 square miles.

RECORDS AVAILABLE.—April 1917 to September 1933.

DISCHARGE.—Maximum during year, 310 second-feet Apr. 22; maximum gage height, 4.32 feet (ice effect) Mar. 27; no flow at times.

1917-33: Maximum, 3,200 second-feet Apr. 13, 1917 (gage height, 8.50 feet); no flow at times.

REMARKS.—Records good except those for period of ice effect Mar. 1-30, which are fair. Staff gage used Oct. 21-24, Mar. 1-22, May 24 to June 16, July 17-26. No records Nov. 1 to Feb. 23. Numerous diversions above station. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Day	Oct.	Mar.	Apr.	May	June	July
1-----	5.3	0	102	98	48.0	26.2	16-----	13.5	0.5	56	65	3.4	0.8
2-----	5.3	0	151	96	45.4	25.1	17-----	13.5	.4	54	62	2.2	.8
3-----	4.1	0	140	115	40.2	35.0	18-----	12.1	.6	63	58	1.0	.5
4-----	4.1	0	92	118	32.8	51	19-----	11.4	.5	184	57	.9	.4
5-----	4.1	0	70	102	26.2	40.2	20-----	13.5	.8	237	57	5.8	.4
6-----	4.8	0	45.4	94	22.2	29.5	21-----	8.7	5.8	201	70	1.0	.3
7-----	4.8	0	31.7	90	16.8	22.2	22-----	8.7	4.6	260	70	2.2	.2
8-----	5.7	0	31.7	88	13.4	16.8	23-----	7.8	21.3	184	63	.8	.1
9-----	5.7	0	73	88	11.8	11.8	24-----	8.7	144	160	57	.8	.1
10-----	5.3	0	73	120	10.2	8.6	25-----	10.7	72	146	63	.7	.1
11-----	5.3	0	63	113	8.6	5.8	26-----	8.7	60	133	77	.5	0
12-----	7.8	.5	63	100	8.6	3.4	27-----	8.3	118	113	70	.4	0
13-----	10.7	0	66	92	7.0	2.2	28-----	7.4	132	111	60	.8	0
14-----	10.1	0	66	80	5.8	.9	29-----	3.6	111	111	57	24.0	0
15-----	10.7	0	58	73	4.6	.8	30-----	4.1	129	102	51	30.6	0
							31-----	3.6	131	-----	48	-----	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	13.5	3.6	7.68	472
March-----	144	0	30.1	1,850
April-----	260	31.7	108	6,430
May-----	120	48.0	79.1	4,860
June-----	48.0	.4	12.6	750
July-----	51	0	9.14	562

NOTE.—No flow during August and September.

WOODPILE COULEE NEAR INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NW¼ sec. 8, T. 37 N., R. 17 E., just below Antelope Coulee, 1½ miles south of international boundary.

DRAINAGE AREA.—70 square miles.

RECORDS AVAILABLE.—March 1927 to September 1933.

DISCHARGE.—Maximum during year, 61 second-feet June 29 (gage height, 2.57 feet); no flow during most of year.

1927-33: Maximum, 423 second-feet Apr. 4, 1927 (gage height, 16.69 feet at old gage three miles downstream); no flow at various times.

REMARKS.—Records fair. No diversions. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

June 29.....	12.8	July 4.....	0.2	Aug. 26.....	2.0
June 30.....	19.6	July 5.....	.1	Aug. 27.....	.8
July 1.....	5.2	July 6.....	.1	Aug. 28.....	.3
July 2.....	1.1	Aug. 24.....	.1	Aug. 29.....	.2
July 3.....	.4	Aug. 25.....	3.3	Aug. 30.....	.1

NOTE.—No flow during year ending Sept. 30, 1933, except on days given above. Run-off, in acre-feet, for June, 64; July, 14; August, 14; the year, 92.

EAST FORK OF BATTLE CREEK NEAR INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NW¼ sec. 17, T. 37 N., R. 20 E., 2 miles south of international boundary and 6 miles east of Norheim, Mont.

DRAINAGE AREA.—98 square miles.

RECORDS AVAILABLE.—March 1927 to September 1933.

DISCHARGE.—Maximum during year, 3.3 second-feet Mar. 15 (gage height, 1.30 feet); no flow at times.

1927-33: Maximum, 432 second-feet Apr. 1, 1928 (gage height, 5.48 feet); no flow at times.

REMARKS.—Records fair. Stage-discharge relation affected by ice Mar. 15-24. No diversions. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

March 15.....	0.8	March 19.....	2.0	March 23.....	0.5
March 16.....	2.3	March 20.....	1.8	March 24.....	.1
March 17.....	2.0	March 21.....	.9		
March 18.....	2.0	March 22.....	.8		

NOTE.—No flow during year ending Sept. 30, 1933, except on days given above. Run-off for March, 26 acre-feet.

LYONS COULEE AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Chain gage in NE¼ sec. 4, T. 37 N., R. 19 E., half a mile south of international boundary, at Norheim, Mont. (Post office moved to present location at gaging station in 1931.)

DRAINAGE AREA.—47 square miles.

RECORDS AVAILABLE.—March 1927 to September 1933.

DISCHARGE.—1927-33: Maximum, 668 second-feet Apr. 3, 1927 (gage height, 7.65 feet); no flow at times.

REMARKS.—Records good. No flow during year ending Sept. 30, 1933. Some small diversions above gage when creek flows during irrigation season. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

MATHESON CANAL NEAR CHINOOK, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 29, T. 33 N., R. 20 E., at head-works of canal, 3½ miles east of Chinook.

RECORDS AVAILABLE.—April 1905 to October 1921; May 1928 to September 1933.

REMARKS.—Records good. Staff gage used May 5–20, Aug. 27. Canal diverts water from right bank of Battle Creek for irrigation of lands between Battle Creek and Milk River.

Discharge, in second-feet, 1932–33

Day	Apr.	May	June	July	Aug.	Day	Apr.	May	June	July	Aug.
1-----	0	9.5	0.8	0.4	0	16-----	4.4	2.3	0.8	0	0
2-----	0	8.6	.8	1.0	0	17-----	3.3	2.1	.7	0	0
3-----	0	7.7	1.1	3.4	0	18-----	3.5	2.0	.3	0	0
4-----	0	7.7	.6	3.4	0	19-----	3.9	1.9	.1	0	0
5-----	0	9.7	.4	3.5	0	20-----	6.4	1.7	0	0	0
6-----	0	9.2	1.1	4.1	0	21-----	6.3	1.9	0	0	0
7-----	5.1	8.6	1.5	3.7	0	22-----	4.7	2.0	.2	0	8.0
8-----	3.7	3.2	1.9	2.4	0	23-----	7.7	1.7	0	0	0
9-----	2.0	3.1	1.8	1.0	0	24-----	5.1	1.7	0	0	0
10-----	2.6	3.8	1.0	0	0	25-----	3.2	1.5	0	0	0
11-----	5.4	4.0	.3	0	0	26-----	2.7	1.4	0	0	0
12-----	4.6	4.3	0	0	0	27-----	6.4	1.5	0	0	0
13-----	3.5	3.8	0	0	0	28-----	11.3	1.8	0	0	0
14-----	4.6	3.8	.8	0	0	29-----	10.5	1.9	0	0	0
15-----	5.7	2.8	1.0	0	0	30-----	9.8	2.0	0	0	0
						31-----		1.4		0	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April-----	11.3	0	4.21	251
May-----	9.7	1.4	3.83	236
June-----	1.9	0	.51	30
July-----	4.1	0	.74	46
August-----	8.0	0	.26	16
The year-----				579

NOTE.—No flow during months omitted.

WHITEWATER CREEK NEAR INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NW¼ sec. 24, T. 37 N., R. 29 E., just below mouth of North Fork of Whitewater Creek, 3½ miles south of international boundary, 5 miles northeast of Lowrane, Mont., and 18 miles south of Roche Plain, Saskatchewan.

RECORDS AVAILABLE.—March 1927 to September 1933.

DISCHARGE.—Maximum during year, 8.5 second-feet Aug. 22 (gage height, 1.39 feet); no flow at times.

1927–33: Maximum, 1,140 second-feet Apr. 5, 1927 (gage height, 4.71 feet); no flow at times.

REMARKS.—Records fair. No record November to February. Stage-discharge relation affected by ice Mar. 1 to Apr. 15. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932–33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.3	0.4	0.2	0.5	0.8	0	0.1
2	.2			.1	.5	.6		
3	.2			.2	.6	.5		
4	.2			.3	.5	.8		
5	.2			1.6	.4	1.2		
6	.4	.1		1.4	.5	.6	.1	
7	.5			1.0	.7	.5		
8	.5			.9	.6	.5		
9	.5			1.0	.5	.4		
10	.5			.7	.4	.4		
11	.6	0	.5	.4	.3	.1		
12	.6		.4	.4	.3			
13	.5		.4	.4	.3			
14	.5		.3	.4	.4			
15	.4		.3	.4	.4			
16	.4	.1	.3	.3	.3	0		
17	.2		.3	.2	.3			
18	.1		.4	.3	.3			
19	.1		.3	.3	.3			
20	0		.3	.4	.3			
21	0	.2	.2	.5	.4	.3	.1	
22	.1			1.4	.8	.2		2.5
23	.1			1.9	.5	.2		.5
24	0			1.1	.5	.2		.4
25	0			.9	.5	.2		.4
26	0	.4		.8	.4	.2	.4	
27	.1			.6	.3	.1		.2
28	.1			.6	.6	0		.2
29	.1			.5	1.0	0		.2
30	.1			.6	.9	0		.1
31	.1			.6		0	.1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.6	0	0.24	15
March		0	.25	15
April			.30	18
May	1.9	.1	.66	41
June	1.0	.2	.49	29
July	1.2	0	.35	22
August	2.5	0	.20	12
September			.10	6.1

* Interpolated.

FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in SW¼ sec. 4, T. 1, R. 10 W. third meridian, in Saskatchewan, just across international boundary from east side of lot 3, sec. 6, T. 37 N., R. 34 E., Mont.

DRAINAGE AREA.—1,875 square miles.

RECORDS AVAILABLE.—April 1917 to September 1933.

DISCHARGE.—Maximum during year, 741 second-feet Mar. 30 (gage height, 4.80 feet); no flow at times.

1917-33: Maximum, 5,440 second-feet Mar. 29, 1925 (gage height, 13.12 feet); no flow at times.

REMARKS.—Records good except those for period of ice effect, Mar. 1 to Apr. 2, which are fair. Staff-gage used Mar. 1-20, July 1-30, Aug. 24-28. No record November to February. Numerous diversions in Canada. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0	10	438	114	60	2' 6	0	23.4
2.....	0	28	345	104	54	"20.3	0	17.0
3.....	0	50	240	97	47.4	13.0	0	8.0
4.....	0	79	266	91	42.0	"45.0	0	4.1
5.....	0	109	395	92	39.6	74	0	2.2
6.....	0	136	374	102	37.2	"4' 1	0	1.2
7.....	0	118	303	110	51	22.2	0	.5
8.....	0	103	179	114	38.8	3' 0	0	.2
9.....	0	92	134	110	34.0	"31.5	0	0
10.....	0	85	176	95	29.8	27.0	0	0
11.....	.1	76	154	92	27.0	"22.5	0	0
12.....	4.6	70	138	92	24.0	1' 0	0	0
13.....	4.6	65	131	92	21.6	"15.6	0	0
14.....	4.1	65	108	96	20.5	13.1	0	0
15.....	4.6	64	105	101	19.5	"11.4	0	0
16.....	7.6	65	106	97	19.0	"9.7	0	0
17.....	7.9	80	104	91	17.0	8.0	0	0
18.....	11.5	100	105	80	15.0	"6.0	0	0
19.....	9.3	141	102	70	14.1	"4.1	0	0
20.....	7.9	218	95	69	16.5	2.3	0	0
21.....	7.9	231	117	69	13.1	"1.6	.5	0
22.....	10.5	245	288	77	29.1	1.0	301	0
23.....	11.5	249	337	90	38.5	"5	129	0
24.....	11.5	238	247	96	22.2	0	65	0
25.....	11.0	231	170	88	12.6	0	24.0	0
26.....	10.5	300	144	86	11.7	0	9.6	0
27.....	10.0	385	131	80	11.2	0	5.3	0
28.....	14.0	473	129	73	27.7	0	3.6	0
29.....	13.0	576	134	66	64	0	2.2	0
30.....	11.0	705	125	65	"44.3	0	1.2	0
31.....	9.0	642	-----	65	-----	0	.7	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	14.0	0	5.87	361
March.....	705	10	194	11,900
April.....	438	95	194	11,500
May.....	114	65	89.2	5,480
June.....	64	11.2	30.1	1,790
July.....	74	0	14.7	904
August.....	301	0	17.5	1,080
September.....	23.4	0	1.89	112

• Interpolated.

FRENCHMAN CANAL NEAR SACO, MONT.

LOCATION.—Water-stage recorder in NE¼ sec. 27, T. 33 N., R. 34 E., 14 miles northeast of Saco.

RECORDS AVAILABLE.—May 1928 to September 1933.

REMARKS.—Records fair. Staff gage used Oct. 1 to Mar. 29, June 11–16. Canal diverts from Frenchman River about 1 mile above gage for irrigation of land in Frenchman Valley.

Discharge, in second-feet, 1932–33

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1-----	0	12.2	12.0	12.4	12.0	0	16-----	0	6.3	15.0	6.2	7.5	0
2-----	0	9.6	12.2	12.2	9.6	0	17-----	0	7.2	15.9	7.3	5.5	0
3-----	0	8.0	12.4	11.7	8.0	0	18-----	0	7.6	15.6	8.2	.9	0
4-----	0	7.6	12.6	11.2	6.1	0	19-----	0	8.4	14.8	8.3	0	0
5-----	0	8.0	12.8	10.7	6.1	0	20-----	0	9.2	13.5	8.2	0	0
6-----	0	9.9	12.8	9.6	12.2	0	21-----	0	9.9	12.8	7.9	0	0
7-----	0	8.9	13.3	9.0	7.6	0	22-----	0	10.8	13.5	7.2	0	4.7
8-----	0	7.1	13.7	9.6	4.4	0	23-----	0	18.9	5.2	8.6	0	0
9-----	0	4.8	14.3	10.0	2.0	0	24-----	0	17.5	13.2	8.0	0	3.8
10-----	0	2.8	15.9	9.0	5.9	0	25-----	0.2	17.3	13.2	8.0	0	1.0
11-----	0	1.7	15.9	7.7	11.9	0	26-----	4.7	9.8	14.5	7.6	0	.1
12-----	0	1.0	14.5	6.3	11.4	0	27-----	7.9	8.4	13.9	6.4	.1	0
13-----	0	.6	14.3	5.2	10.5	0	28-----	6.2	10.8	13.2	6.2	0	0
14-----	0	0	13.9	3.8	9.9	0	29-----	12.2	11.5	13.0	5.9	0	0
15-----	0	1.6	14.3	4.1	8.7	0	30-----	16.3	11.9	12.8	4.7	0	0
							31-----	12.6	-----	12.6	-----	0	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March-----	16.3	0	1.94	119
April-----	18.9	0	8.31	494
May-----	15.9	5.2	13.5	830
June-----	12.4	3.8	8.04	478
July-----	12.2	0	4.53	279
August-----	4.7	0	.31	19
The year-----	-----	-----	-----	2,220

NOTE.—No flow during months omitted.

ROCK CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Chain gage in SE¼ sec. 1, T. 37 N., R. 37 E., three-quarters of a mile south of international boundary, 2 miles above mouth of Horse Creek, and 5 miles west of Barnard, Mont.

DRAINAGE AREA.—242 square miles.

RECORDS AVAILABLE.—March 1927 to September 1933.

DISCHARGE.—Maximum during year, 208 second-feet Mar. 18 (gage height, 5.33 feet); no flow at times.

1927-33: Maximum, 982 second-feet Apr. 6, 1927 (gage height, 10.51 feet); no flow at times.

REMARKS.—Records poor. No records Nov. 1 to Feb. 28. Stage discharge affected by ice Mar. 1-19. One small diversion above gage. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			66	8.0	8.5	53	16.1	0
2			40.3	7.4	5.8	57	13.3	0.6
3		5.0	25.3	16.3	3.2	57	10.5	1.3
4			21.2	11.1	.6	56	9.1	1.4
5			12.6	9.0	0	54	7.8	1.3
6			10.5	9.4	.1	50	6.4	.5
7		3.0	9.3	9.9	0	48.8	6.2	.5
8			8.8	10.5	16.3	50	6.0	1.0
9			8.2	10.2	15.9	34.2	2.9	1.4
10		5.0	7.7	9.0	20.0	42.6	2.0	1.4
11			7.2	8.2	21.2	51	1.3	1.4
12			11.4	7.7	22.4	54	1.0	2.3
13			15.2	10.2	7.2	22.0	56	3.2
14			27.0	9.0	5.9	21.6	54	3.2
15			42.6	10.8	4.6	21.6	57	3.8
16		65	15.2	4.8	21.4	63	0	4.4
17		113	13.9	5.1	21.3	58	0	5.8
18		208	15.2	5.5	21.2	55	0	7.3
19		178	13.4	6.2	21.1	52	0	8.7
20		109	11.7	14.2	21.0	49.7	0	4.4
21		118	9.9	18.8	20.9	46.9	0	0
22		56	9.0	9.3	20.8	44.1	125	0
23		50	6.7	9.6	31.6	41.3	64	0
24		59	7.2	9.9	33.2	38.4	20.8	0
25		34.7	8.5	10.2	34.7	35.6	170	0
26		33.7	9.3	12.3	37.8	32.9	76	0
27		36.8	8.5	12.3	40.8	30.0	7.2	0
28		61	8.2	12.6	43.8	27.3	3.6	0
29		89	9.3	12.3	46.9	24.5	0	0
30		177	8.7	12.0	50	21.7	0	0
31		91		12.0		18.9	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October			0.26	16
March	208		52.2	3,210
April	66	6.7	13.8	821
May	18.8	4.6	9.73	598
June	50	0	21.5	1,280
July	63	18.9	45.6	2,800
August	170	0	17.7	1,090
September	8.7	0	1.80	107

* Estimated or interpolated.

HORSE CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Staff gage in SE¼ sec. 3, T. 37 N., R. 37 E., three-quarters of a mile south of international boundary.

DRAINAGE AREA.—71 square miles.

RECORDS AVAILABLE.—May 1914 to October 1917; March 1927 to September 1933; May 1914 to October 1926 maintained by Department of the Interior, Canada.

DISCHARGE.—Maximum during year, 268 second-feet Aug. 22 (gage height, 8.28 feet); no flow at times.

1914-33: Maximum, 1,040 second-feet Mar. 30, 1925 (gage height, 10.85 feet); no flow at times.

REMARKS.—Records fair. No diversions. Stage-discharge relation affected by ice Mar. 1 to 19. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Mar.	Apr.	May	Aug.	Sept.	Day	Mar.	Apr.	May	Aug.	Sept.
1-----	0	2.3	0	0	* 0	16-----	27.8	0	* 0	0	0
2-----	0	* 1.5	0	0	* 0	17-----	55	0	.1	0	* 0
3-----	0	.8	0	0	.1	18-----	* 40.0	0	.1	0	* 0
4-----	0	.4	0	0	* 0	19-----	31.2	* 0	0	0	* 0
5-----	0	.3	0	0	* 0	20-----	* 25.0	0	0	0	0
6-----	0	.1	0	0	0	21-----	* 20.0	0	0	0	* 0
7-----	0	0	0	0	0	22-----	* 17.0	0	0	112	* 0
8-----	0	* 0	0	0	* 0	23-----	* 13.0	0	0	4.6	* 0
9-----	0	0	0	0	0	24-----	* 12.0	0	0	* 7.4	* 0
10-----	0	* 0	0	0	* 0	25-----	* 11.0	0	0	* 14.3	* 0
11-----	0	0	0	0	0	26-----	* 9.0	0	0	17.0	* 0
12-----	0	0	0	0	* 0	27-----	* 8.0	0	0	1.6	0
13-----	* 2.0	0	0	0	* 0	28-----	7.5	0	0	.1	* 0
14-----	3.9	0	0	0	0	29-----	9.1	0	0	* 0	0
15-----	* 15.0	0	0	0	* 0	30-----	* 6.0	0	0	* 0	* 0
						31-----	3.0	-----	0	* 0	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March-----	55	0	10.2	627
April-----	2.3	0	.18	11
May-----	.1	0	.01	.4
August-----	112	0	5.06	311
September-----	.1	0	.003	.2

* Estimated or interpolated.

NOTE.—No flow during October, June, July. No record Nov. 1 to Feb. 28.

MCEACHERN CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Staff gage in SW $\frac{1}{4}$ sec. 1, T. 37 N., R. 36 E., half a mile south of international boundary and 7 miles north of Thoeny.

DRAINAGE AREA.—160 square miles.

RECORDS AVAILABLE.—March 1927 to September 1933. March 1924 to October 1926. Station above east fork of this stream maintained by Department of the Interior, Canada.

DISCHARGE.—Maximum during year, 362 second-feet Aug. 22 (gage height, 6.07 feet); no flow at times.

1927-33: Maximum, 1,850 second-feet Apr. 9, 1927 (gage height, 10.42 feet); no flow at times.

REMARKS.—Records fair. No diversions. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Mar.	Apr.	May	Aug.	Sept.	Day	Mar.	Apr.	May	Aug.	Sept.
1.....	0	2.4		0	10.3	16.....	34.0	0	0.1	0	0.1
2.....	0	1.7		0	4.4	17.....	39.3			0	
3.....	0	1.1		0	2.7	18.....	49.6			0	
4.....	0	1.1		0	.8	19.....	28.7			0	
5.....	46.0	.2		0	.5	20.....	20.4			0	
6.....	38.9	.2	0.1	0	.4	21.....	12.6	0	0	0	0.1
7.....	26.3			0	.1	22.....	7.0			304	
8.....	24.8			0		23.....	6.2			33.7	
9.....	20.4	.1		0		24.....	4.4			9.9	
10.....	17.6			0		25.....	9.2			32.5	
11.....	15.0		0	0	.1	26.....	4.1	.1	0	18.2	
12.....	26.3			0		27.....	8.2			0	
13.....	23.3			0		28.....	4.4			0	
14.....	20.4			0		29.....	4.8			0	
15.....	25.7			0		30.....	6.6			23.3	
						31.....	4.8			16.5	
Month						Maximum	Minimum	Mean	Run-of in acre-feet		
March.....						49.6	0	17.1	1,050		
April.....						2.4	0	.26	15		
May.....							0	.07	4.3		
August.....						304	0	14.1	867		
September.....						10.3	0.1	.72	43		

NOTE.—No flow during October, June, July. No record Nov. 1 to Feb. 28.

POPLAR RIVER BASIN

MIDDLE FORK OF POPLAR RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in SE¼ sec. 6, T. 37 N., R. 46 E., half a mile south of international boundary and 20 miles northwest of Scobey, Mont.

DRAINAGE AREA.—381 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, 365 second-feet Mar. 19 (gage height, 5.48 feet, affected by ice); no flow at times.

1931-33: Maximum, that of Mar. 19, 1933; no flow at times.

REMARKS.—Records good. No records Nov. 1 to Feb. 28. Stage-discharge relation affected by ice Mar. 1 to Apr. 1. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8	68	66	9.5	11.0	0.8	0.2	22.0
2	1.8		56	8.2	13.5	.6	.2	12.0
3	1.8		30.6	8.2	16.5	.5	.2	8.2
4	1.8	43	21.5	8.2	13.0	.4	.2	6.2
5	2.3		23.0	8.6	11.0	.4	.2	4.3
6	2.6		20.0	11.5	9.0	.4	.2	2.8
7	2.6	68	23.5	13.0	11.0	.3	.2	2.0
8	2.8		26.4	18.0	11.0	.3	0	1.7
9	3.0		18.0	24.6	9.0	.2	0	1.3
10	3.3	61	13.0	23.5	8.2	.2	0	1.3
11	2.8		17.0	17.5	6.6	.2	0	1.3
12	3.8		17.0	13.5	5.8	.2	0	1.2
13	4.4	56	15.5	11.0	5.0	.2	0	1.2
14	5.0		15.0	9.5	4.3	.2	0	1.2
15	5.0		15.5	8.2	2.8	.2	0	1.3
16	4.7	106	16.0	7.8	1.2	.2	0	2.4
17	4.7		15.0	7.4	.8	.2	0	2.0
18	5.0		14.5	9.0	.5	.2	0	1.7
19	8.1	354	12.5	10.0	.7	.1	0	1.7
20	7.4	138	11.0	11.5	.7	.1	0	1.3
21	5.9	141	10.5	10.5	.7	.2	0	1.2
22	6.2		9.5	15.0	.6	.2	.7	1.1
23	6.2		8.6	36.6	.8	.2	.4	1.1
24	6.2	129	9.0	65.0	1.0	.1	.4	1.1
25	5.6		9.0	56.0	.7	.1	7.4	1.0
26	5.6		8.6	32.4	.7	.1	5.4	1.0
27	5.6	129	9.5	22.0	.6	.1	1.3	.9
28	8.4		9.5	20.5	.5	0	.9	.9
29	9.4		11.5	15.5	.6	0	.6	.9
30	10.4	10.8	11.0	13.0	.8	0	.4	.8
31	10.8			11.5		.1	8.2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	10.8	1.8	5.00	307
March	354		100	6,150
April	66	8.6	18.1	1,080
May	65	7.4	17.3	1,060
June	16.5	.5	4.95	295
July	.8	0	.23	14
August	8.2	0	.87	53
September	22.0	.8	2.90	173

EAST FORK OF POPLAR RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in SW¼ sec. 3, T. 1, R. 26 W. third meridian, at international boundary in Saskatchewan, 16 miles north of Scooby, Mont.

DRAINAGE AREA.—256 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, 105 second-feet Mar. 1 (gage height, 5.69 feet, ice present); minimum, 1.9 second-feet Sept. 30 (gage height, 1.89 feet).
1931-33: Maximum, 975 second-feet Aug. 13, 1932 (gage height, 10.70 feet); minimum, 0.5 second-foot (estimated) Mar. 12, 1932.

REMARKS.—Records fair. No records Nov. 1 to Feb. 28. Stage-discharge relation affected by ice Oct. 28, 29, Mar. 1 to Apr. 19. Staff gage used Mar. 1 to Apr. 26. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3.7	105	18.6	6.5	20.8	14.3	3.7	4.4
2.....	3.7	103	17.7	6.4	21.2	13.9	4.0	3.8
3.....	3.7	97	16.1	6.3	22.3	12.7	4.0	3.8
4.....	3.7	7.5	15.1	6.2	18.8	12.4	4.1	3.2
5.....	3.9	4.9	17.1	6.2	18.6	12.0	4.6	3.0
6.....	4.1	8.2	19.1	6.3	18.0	11.8	4.7	2.8
7.....	4.1	10.0	18.0	6.3	18.2	12.0	3.9	2.9
8.....	4.1	10.6	19.5	6.8	18.0	11.0	3.7	2.7
9.....	4.2	9.2	18.9	7.2	17.7	11.6	3.5	2.9
10.....	4.4	6.0	19.8	7.1	17.0	11.2	3.2	2.8
11.....	4.4	5.4	20.6	7.0	16.1	19.4	3.1	2.9
12.....	4.6	5.2	18.4	6.9	15.9	9.7	2.9	2.7
13.....	4.8	6.4	16.6	6.5	15.4	8.9	3.0	2.7
14.....	4.9	10.0	16.6	6.3	15.4	8.2	2.8	2.4
15.....	5.0	9.5	13.3	6.3	15.2	7.7	2.8	3.0
16.....	5.0	11.8	10.6	6.4	14.9	7.5	2.6	3.2
17.....	5.0	14.9	9.6	6.5	14.4	7.2	2.4	2.7
18.....	5.1	16.4	9.7	6.5	14.4	6.8	2.4	2.8
19.....	6.9	22.3	10.0	6.4	14.7	6.5	2.3	2.5
20.....	5.5	28.8	10.2	6.4	14.9	6.1	2.4	2.3
21.....	5.7	27.2	8.2	6.4	15.1	6.1	2.6	2.6
22.....	5.8	26.8	7.7	20.8	14.9	5.6	3.7	2.5
23.....	6.1	26.2	8.4	45.5	14.7	5.5	3.6	2.6
24.....	5.7	28.0	7.5	40.0	15.1	5.5	3.3	2.4
25.....	5.5	31.6	7.1	38.0	15.1	5.2	4.3	2.4
26.....	6.0	35.6	7.1	32.8	14.7	4.9	4.3	2.4
27.....	6.1	40.2	6.8	28.8	14.4	4.5	3.7	2.4
28.....	6.2	44.8	6.6	26.6	13.8	4.8	3.3	2.4
29.....	6.4	40.5	6.6	24.4	13.9	4.2	3.1	2.4
30.....	6.6	31.6	6.8	23.0	14.1	4.1	2.9	2.3
31.....	6.8	24.2	-----	22.1	-----	3.9	3.4	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	6.9	3.7	5.09	313
March.....	105	4.9	27.4	1,680
April.....	20.6	6.6	12.9	768
May.....	45.5	6.2	14.2	873
June.....	22.3	13.8	16.3	970
July.....	14.3	3.9	8.27	508
August.....	4.7	2.3	3.36	207
September.....	4.4	2.3	2.80	167

WEST FORK OF POPLAR RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in SE¼ sec. 5, T. 1, R. 3 W. third meridian, in Saskatchewan, at West Poplar River Canadian Customs Post, at international boundary, 11 miles north and three-quarters of a mile east of Opheim, Mont.

DRAINAGE AREA.—141 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, 115 second-feet Mar. 18 (gage height, 3.36 feet, ice effect); no flow at times.

1931-33: Maximum, that of Mar. 18, 1933; no flow at times.

REMARKS.—Records good except those for period of ice effect, Mar. 1 to Apr. 15, which are fair. Staff gage used Mar. 18 to Apr. 25. Discharge interpolated Apr. 26, June 2, and Aug. 31 to Sept. 5. No record Nov. 1 to Feb. 28. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.05	0	12.0	0.8	1.1	1.8	0	1.5
2	.05	0		.6	1.1	1.7	0	1.4
3	.05	0		.6	1.1	1.7	0	1.2
4	.05	0		.6	1.1	1.7	0	1.0
5	.1	0		.6	1.1	1.8	0	.8
6	.1	0	8.0	.6	1.1	2.1	0	.6
7	.1	0		.7	1.3	2.0	0	.6
8	.1	0		.7	1.1	2.0	0	.5
9	.1	0		.8	1.1	2.1	0	.5
10	.1	0		.7	1.1	1.7	0	.5
11	.1	0	3.0	.6	1.0	1.7	0	.4
12	.1	0		.6	1.0	1.7	0	.4
13	.1	0		.6	1.0	1.7	0	.4
14	.1	0		.5	1.0	1.7	0	.3
15	.1	0		.5	1.1	1.6	0	.4
16	.1	0	3.7	.5	.8	1.4	0	.4
17	.2	82	3.7	.6	.8	1.2	0	.3
18	.2		3.7	.8	.8	1.0	0	.3
19	.2		3.3	.8	1.3	.9	0	.2
20	.2		2.6	.9	1.4	.7	0	.3
21	.2	49	2.0	1.0	1.3	.7	0	.3
22	.2		1.7	1.4	1.4	.6	0	.3
23	.2		1.4	2.1	1.4	.6	0	.3
24	.2		1.4	2.6	1.4	.6	0	.3
25	.1		1.4	2.6	1.6	.5	18.6	.3
26	.1	18	1.2	2.4	1.3	.4	19.8	.2
27	.1		1.0	2.3	1.2	.3	9.8	.3
28	.2		1.1	2.0	1.4	.2	5.0	.2
29	.2		1.0	2.0	1.6	.2	2.4	.2
30	.2		.9	1.6	1.8	.1	1.7	.2
31	.2			1.3		.1	1.6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.2	0.05	0.13	8.0
March		0	19.7	1,210
April		.9	4.84	288
May	2.6	.5	1.11	68
June	1.8	.8	1.19	71
July	2.1	.1	1.18	73
August	19.8	0	1.90	117
September	1.5	.2	.49	29

YELLOWSTONE RIVER BASIN

YELLOWSTONE LAKE AT LAKE HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—Staff gage at boat landing at Lake Hotel, $1\frac{1}{2}$ miles southwest of lake outlet. Zero of gage is 7,729.45 feet above mean sea level (revised on basis of 1929 adjustment).

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—October 1921 to September 1933.

EXTREMES.—Maximum stage during year, 4.42 feet June 27, 29, 30; minimum, 0.2 foot Dec. 7, 8, 15, 17, 25.

1921-33: Maximum stage, 6.12 feet June 30, 1927; minimum, -0.1 foot Dec. 7, 8, 1931.

REMARKS.—Records good. Days of missing gage-height record estimated on basis of mean daily gage heights of Yellowstone River at Yellowstone Lake Outlet by means of a gage-height relation curve. No regulation. Records furnished by officials of Yellowstone Park.

Gage height, in feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	0.7	0.3				0.5		1.2	4.40	2.8	1.8
2	1.2	.6	.3						1.5	4.36	2.84	1.7
3	1.2	.6	.3						1.7	4.30	2.8	1.68
4	1.2	.6	.3						1.9	4.27	2.7	1.6
5	1.1	.6	.3		0.5				2.0	4.22	2.72	1.6
6	1.1	.6	.3					0.7	2.2	4.18	2.6	1.59
7	1.04	.6	.2						2.3	4.12	2.6	1.6
8	1.1	.6	.2						2.4	4.10	2.5	1.6
9	1.1	.6							2.64	4.10	2.5	1.6
10		.6							2.6	4.1	2.4	1.5
11		.6			.6	0.7			2.88	4.05	2.38	1.5
12		.6							3.10	3.9	2.4	1.57
13		.5						.7	3.24	3.91	2.3	1.4
14		.5		0.5					3.44	3.8	2.3	1.4
15	1.0	.5	.2						3.58	3.78	2.26	1.4
16	1.0	.5							3.74	3.7	2.2	1.4
17	1.0	.5	.2						3.88	3.70	2.2	1.3
18	.9	.5			.7	.7			4.06	3.6	2.14	1.3
19	.9	.5							4.16	3.56	2.1	1.3
20	.9	.4							4.26	3.5	2.12	1.3
21	.9	.4							4.32	3.4	2.1	1.2
22	.9	.4					.6		4.36	3.40	2.08	1.3
23	.8	.4						.9	4.38	3.3	2.0	1.20
24	.8	.4						0.87	4.38	3.26	2.0	1.2
25	.8	.4	.2		.7	.6		.9	4.40	3.2	1.92	1.2
26	.7	.4						1.0	4.40	3.18	1.9	1.2
27	.7	.4						1.1	4.42	3.1	1.90	1.2
28	.7	.3						1.1	4.40	3.1	1.9	1.1
29	.7	.3						1.2	4.42	3.0	1.9	1.1
30	.7	.3						1.2	4.42	3.0	1.8	1.12
31	.7					.6		1.2		2.92	1.78	

* Actual gage observations.

YELLOWSTONE RIVER AT YELLOWSTONE LAKE OUTLET, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder 550 feet below Fishing Bridge and a quarter of a mile below outlet of Yellowstone Lake. Staff gage at Fishing Bridge is also used. Zero of gage at recorder site is 7,727.78 feet and staff gage at Fishing Bridge 7,728.84 feet above mean sea level (revised on basis of 1,929 adjustment).

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—December 1922 to September 1933. Gage-height records only prior to October 1926.

DISCHARGE.—Maximum discharge during year, 4,690 second-feet June 28 (gage height, 5.76 feet); minimum, 349 second-feet Dec. 17 (gage height, 1.81 feet).

1922-33: Maximum discharge, 7,420 second-feet June 29, 30, and July 1, 1927 (gage height, 6.3 feet at Fishing Bridge site or 7.1 at recorder site); minimum, 220 second-feet Dec. 7, 1931 (gage height, 1.45 feet).

REMARKS.—Records good except those estimated or interpolated, which are fair. Discharge estimated Dec. 21 to Apr. 15 on account of ice. No artificial regulation. Gage-height record furnished by Yellowstone Park officials.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	833	542	408				505		798	4,360	2,240	1,160
2	805	536	408						1,050	4,360	2,240	1,120
3	805	530	403					• 560	1,250	4,200	2,170	1,090
4	805	525	394						1,390	4,200	2,110	1,070
5	798	520	390						1,530	4,040	2,110	1,070
6	798	515	381				• 510	564	1,690	4,040	2,050	1,050
7	784	515	373						1,800	3,890	1,980	1,020
8	784	515	369					• 570	1,920	3,890	1,920	992
9	784	515	• 369						2,050	3,890	1,860	992
10	• 775	510	• 369						2,170	3,890	1,800	983
11	• 766	505	• 369					• 580	2,360	3,740	1,800	958
12	• 758	500	• 369						2,560	3,590	1,740	932
13	• 749	485	• 369			• 450	• 520	580	2,820	3,590	1,690	915
14	• 740	480	• 369						3,020	3,520	1,690	924
15	731	480	369		• 400			• 600	3,200	3,440	1,630	924
16	724	470	• 359	• 400					3,520	3,370	1,580	900
17	705	466	349						3,740	3,300	1,550	870
18	672	462						• 620	3,890	3,230	1,490	862
19	672	462	• 350				• 530		4,040	3,160	1,500	840
20	666	452							4,200	3,090	1,520	826
21	653	448						• 650	4,360	3,020	1,480	805
22	646	434					• 535		4,360	2,950	1,430	812
23	634	430	• 360					679	4,360	2,820	1,390	777
24	616	426					• 540	679	4,360	2,750	1,350	777
25	604	421	373					692	4,520	2,680	1,300	777
26	586	421						718	4,360	2,620	1,290	770
27	586	416						757	4,360	2,560	1,290	757
28	564	412				• 500	• 550	777	4,520	2,560	1,280	750
29	564	412	• 380					812	4,520	2,490	1,250	750
30	558	412						840	4,520	2,360	1,230	724
31	552					515		862		2,300	1,180	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	833	552	701	0.694	0.80	43,100
November	542	412	474	.469	.52	28,200
December	408		373	.369	.43	22,900
January			400	.396	.46	24,600
February			400	.396	.41	22,200
March			460	.455	.52	28,300
April			526	.521	.58	31,300
May	862		639	.633	.73	39,300
June	4,520	798	3,110	3.08	3.44	185,000
July	4,360	2,300	3,350	3.32	3.83	206,000
August	2,240	1,180	1,650	1.63	1.88	101,000
September	1,160	724	907	.898	1.00	54,000
The year	4,520		1,090	1.08	14.60	786,000

• Estimated or interpolated.

YELLOWSTONE RIVER NEAR CANYON HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder half a mile upstream from Upper Falls and Canyon ranger station and $1\frac{1}{4}$ miles south of Canyon Hotel.

DRAINAGE AREA.—1,160 square miles.

RECORDS AVAILABLE.—June 1913 to September 1933 (except winters).

DISCHARGE.—Maximum discharge during year, 4,680 second-feet June 26 (gage height, 3.13 feet); minimum occurred during period of no record.

1913-33: Maximum discharge, 8,550 second-feet June 27, 1918 (gage height, 4.50 feet); minimum usually occurs during winter period of no record.

REMARKS.—Records good. No artificial regulation or diversions. Gage observations furnished by officials of Yellowstone Park.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	May	June	July	Aug.	Sept.
1	924			1,240	4,440	2,300	1,230
2	916			1,420	4,330	2,260	1,200
3	890			1,540	4,330	2,220	1,180
4	882			1,720	4,220	2,140	1,140
5	874			1,800	4,100	2,080	1,140
6	866			1,920	4,100	2,000	1,120
7	866			2,040	3,990	1,940	1,100
8	874			2,140	3,990	1,900	1,080
9	874			2,260	3,990	1,860	1,060
10	858			2,400	3,880	1,830	1,060
11	858			2,560	3,770	1,780	1,020
12	850			2,770	3,770	1,750	993
13	834			3,000	3,660	1,720	975
14	818			3,230	3,550	1,690	975
15	802			3,440	3,440	1,660	984
16	780			3,660	3,440	1,610	950
17	765			3,880	3,340	1,600	916
18	721			3,990	3,340	1,550	907
19	707			4,220	3,230	1,570	882
20	700			4,330	3,150	1,540	850
21	693			4,440	3,060	1,540	842
22	686			4,440	2,960	1,470	834
23	679		1,050	4,560	2,870	1,450	826
24	652		1,050	4,560	2,810	1,420	810
25	646		1,120	4,560	2,750	1,370	826
26	646		1,160	4,560	2,700	1,350	802
27	658		1,140	4,560	2,620	1,350	795
28	646		1,100	4,560	2,600	1,320	788
29	626	• 596	1,190	4,560	2,500	1,300	788
30	632		1,280	4,560	2,440	1,290	780
31	620		1,360		2,360	1,280	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	924	620	769	0.663	0.76	47,300
May 23-31	1,360	1,050	1,160	1.00	.33	20,700
June	4,560	1,240	3,300	2.84	3.17	196,000
July	4,440	2,360	3,410	2.94	3.39	210,000
August	2,300	1,280	1,680	1.45	1.67	103,000
September	1,230	780	962	.829	.92	57,200

• Result of discharge measurement.

YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT.

LOCATION.—Chain gage in NW¼ sec. 30, T. 8 S., R. 8 E., at high way bridge at Corwin Springs, 8 miles north of Gardiner.

DRAINAGE AREA.—2,630 square miles.

RECORDS AVAILABLE.—September 1910 to August 1933.

DISCHARGE.—Maximum during year, 15,800 second-feet June 15, 16 (gage height, 7.75 feet); minimum, not determined, occurred during ice period.

1910-33: Maximum, 26,500 second-feet June 14, 15, 1918 (gage height, 11.5 feet); minimum, 585 second-feet Feb. 14-18, 1932 (gage height, 0.42 foot).

REMARKS.—Records good except those for estimated periods of ice effect, Dec. 11-22 and Feb. 8-20. Natural storage in Yellowstone Lake.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	1,310	1,070	935	655	710	665	935	2,320	10,500	7,620	2,880
2	1,310	1,070	935	665	710	665	935	2,060	11,500	7,350	3,190
3	1,220	1,070	875	665	710	665	935	1,930	12,400	6,810	3,030
4	1,220	1,070	875	665	710	665	935	2,060	11,800	6,810	3,030
5	1,220	1,070	875	665	665	665	935	1,930	11,800	6,610	2,740
6	1,220	1,000	760	665	665	665	935	1,930	11,200	6,410	-----
7	1,220	1,000	760	665	665	710	935	1,810	11,500	6,200	-----
8	1,220	1,000	710	665	665	710	935	1,700	10,800	6,000	-----
9	1,220	1,000	665	665	665	710	875	1,600	10,200	5,800	-----
10	1,220	1,000	625	665	-----	760	875	1,500	13,100	5,800	-----
11	1,220	1,000	-----	665	-----	760	875	1,400	13,400	5,560	-----
12	1,220	1,000	-----	665	580	760	875	1,400	13,400	5,320	-----
13	1,220	1,000	580	665	-----	815	875	1,310	15,100	5,080	-----
14	1,220	1,000	-----	665	-----	875	935	1,310	15,500	4,850	-----
15	1,220	1,000	-----	665	-----	875	935	1,310	15,800	4,850	-----
16	1,220	1,000	-----	665	-----	875	1,000	1,600	15,800	4,420	-----
17	1,220	1,000	-----	665	625	875	1,000	1,930	15,500	4,420	-----
18	1,310	1,000	-----	665	-----	875	1,070	2,190	14,400	4,420	-----
19	1,220	935	625	665	-----	875	1,070	2,320	14,100	4,220	-----
20	1,140	935	-----	665	-----	875	1,000	2,460	12,400	4,220	-----
21	1,140	935	-----	665	665	875	935	3,350	11,500	4,220	-----
22	1,140	935	-----	710	665	875	935	4,630	10,800	4,030	-----
23	1,070	935	875	710	665	875	1,140	4,030	10,500	3,680	-----
24	1,070	935	1,070	710	665	875	1,310	3,850	9,930	3,680	-----
25	1,070	935	1,070	710	665	875	1,400	4,220	9,630	3,680	-----
26	1,070	935	815	710	665	875	1,600	6,040	9,340	3,510	-----
27	1,000	935	815	665	665	935	1,600	6,040	8,760	3,510	-----
28	1,000	935	665	665	665	935	2,600	4,630	8,760	3,510	-----
29	1,000	935	665	665	-----	935	2,880	5,080	8,470	3,350	-----
30	1,000	935	665	710	-----	935	2,740	7,350	8,180	3,030	-----
31	1,070	-----	665	710	-----	935	-----	9,930	-----	3,030	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,310	1,000	1,170	0.445	0.51	71,900
November	1,070	935	986	.375	.42	58,700
December	1,070	-----	729	.277	.32	44,800
January	710	665	675	.257	.30	41,500
February	710	-----	645	.245	.26	35,800
March	935	665	815	.310	.36	50,100
April	2,880	875	1,200	.456	.51	71,400
May	9,930	1,310	3,070	1.17	1.35	189,000
June	15,800	8,180	11,900	4.52	5.04	708,000
July	7,620	3,030	4,910	1.87	2.16	302,000
August 1-5	3,190	2,740	2,970	1.13	.21	29,500
The period	-----	-----	-----	-----	-----	1,600,000

* Interpolated.

YELLOWSTONE RIVER AT BILLINGS, MONT.

LOCATION.—Water-stage recorder in NE¼ sec. 2, T. 1 S., R. 26 E., at Billings.
 RECORDS AVAILABLE.—May 1904 to December 1905; August 1928 to June 1933.

DISCHARGE.—Maximum during year, 38,300 second-feet June 14, 15 (gauge height, 8.50 feet); minimum, 430 second-feet Dec. 12 (gauge height, 1.80 feet, ice effect).

1904-5, 1928-33: Maximum, that of June 14, 15, 1933; minimum, that of Dec. 12, 1932.

REMARKS.—Records good except those for period of ice effect Nov. 14-19, Dec. 8 to Mar. 15, which are fair. Staff gage used May 18-22, June 1-6, 11-22. Numerous diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	2,970	2,970	2,760	1,520	1,810	2,510	2,300	7,800	22,500
2.....	2,860	2,970	2,720	1,340	1,770	2,700	2,330	6,910	25,200
3.....	2,970	3,080	2,720	1,360	1,700	2,970	2,260	5,930	28,200
4.....	2,860	2,970	2,660	1,340	1,670	2,970	2,240	6,250	28,800
5.....	2,760	2,860	2,680	1,360	1,700	2,740	2,390	6,250	27,400
6.....	2,660	2,860	2,760	1,330	1,760	2,610	2,410	6,250	25,200
7.....	2,970	2,970	2,390	1,340	1,470	2,700	2,280	7,800	23,900
8.....	3,190	3,080	2,370	1,420	1,340	2,410	2,490	7,080	23,900
9.....	3,300	3,080	1,810	1,700	1,220	2,450	2,530	6,580	21,200
10.....	3,300	3,190	990	1,370	1,020	2,390	2,330	6,420	22,500
11.....	3,300	3,190	680	1,240	1,220	2,410	2,150	6,420	32,500
12.....	3,300	2,970	450	1,280	1,280	2,310	2,120	6,580	36,800
13.....	3,300	2,970	500	1,300	1,360	2,240	2,210	6,420	36,800
14.....	3,300	2,970	838	1,420	1,370	3,760	2,120	6,250	38,300
15.....	3,300	3,080	940	1,440	1,390	3,760	2,100	6,250	38,300
16.....	3,410	2,680	1,160	1,280	1,500	3,410	2,120	6,090	37,600
17.....	3,520	2,660	1,160	955	1,520	3,190	2,310	6,420	36,800
18.....	3,870	2,860	1,250	724	1,600	2,860	2,630	5,620	35,400
19.....	3,870	2,970	1,370	1,050	1,630	2,760	2,860	5,620	32,500
20.....	3,640	3,080	1,410	1,570	1,630	2,550	3,300	5,930	29,600
21.....	3,300	3,080	1,410	1,770	1,680	2,430	3,300	6,250	25,900
22.....	3,300	2,970	1,360	1,920	1,920	2,410	2,970	7,420	21,800
23.....	3,300	3,080	1,310	1,940	2,060	2,310	2,860	10,200	20,500
24.....	3,190	2,970	1,360	1,950	1,870	2,240	3,300	10,000	19,900
25.....	3,080	2,860	1,430	1,850	2,120	2,170	3,640	9,200	18,000
26.....	3,080	2,760	1,420	1,940	2,120	2,130	3,870	9,200	16,800
27.....	2,970	2,860	1,420	1,920	2,260	2,190	4,100	11,300	16,200
28.....	2,970	2,860	1,410	1,920	2,310	2,220	4,330	13,200	15,700
29.....	2,970	2,760	1,410	1,810	-----	2,310	4,930	11,300	15,100
30.....	3,080	2,760	1,420	1,940	-----	2,410	6,580	10,400	15,100
31.....	3,080	-----	1,390	1,810	-----	2,330	-----	13,600	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3,870	2,660	3,190	196,000
November.....	3,190	2,660	2,950	176,000
December.....	2,760	450	1,580	97,200
January.....	1,950	724	1,520	93,500
February.....	2,310	1,020	1,650	91,600
March.....	3,760	2,130	2,610	160,000
April.....	6,580	2,100	2,910	173,000
May.....	13,600	5,620	7,770	478,000
June.....	38,300	15,100	26,300	1,560,000
The period.....	-----	-----	-----	3,030,000

YELLOWSTONE RIVER AT MILES CITY, MONT.

LOCATION.—Water-stage recorder at highway bridge just below mouth of Tongue River, at Miles City.

RECORDS AVAILABLE.—September 1922 to August 1923; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 60,800 second-feet June 19 (gage height, 11.62 feet); minimum, 996 second-feet Dec. 14 (ice present).

1922-23, 1928-33: Maximum, 65,200 second-feet June 28, 1932 (gage height, 12.17 feet); minimum, 996 second-feet Dec. 14, 1932 (ice present).

REMARKS.—Records good except those for periods of ice effect, Nov. 10-20, Dec. 1 to Mar. 7, which are fair. Numerous diversions from stream and tributaries above gage. Some storage on tributary streams.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	5,520	5,990	4,980	3,060	3,620	5,410	6,110	12,100	23,000	27,700	4,590	14,400
2.....	5,520	5,990	4,980	3,130	3,700	7,050	5,870	14,500	29,800	25,700	4,400	10,800
3.....	5,190	5,870	4,880	3,340	3,700	9,600	5,520	16,000	35,400	23,300	4,300	9,600
4.....	4,880	5,870	4,880	3,410	3,780	10,400	5,300	15,500	42,800	2,800	4,400	8,330
5.....	4,780	5,870	4,880	3,480	3,550	9,040	5,080	14,000	47,200	20,000	4,590	7,660
6.....	4,500	5,750	4,400	3,620	3,410	9,600	4,880	13,500	48,000	19,400	4,880	7,050
7.....	4,680	5,630	4,120	3,620	3,340	15,300	4,980	15,000	51,000	18,800	5,080	6,490
8.....	5,080	5,520	3,500	3,620	3,340	13,000	4,980	17,100	48,800	18,300	6,490	5,990
9.....	5,300	5,520	2,870	3,620	3,340	8,680	4,980	17,100	45,800	16,600	6,490	5,630
10.....	5,410	4,980	2,280	3,860	2,950	7,350	5,080	17,100	42,800	16,000	5,990	5,520
11.....	5,630	4,980	1,670	3,860	2,560	7,990	5,190	17,100	40,600	15,500	5,630	5,300
12.....	5,760	4,980	1,340	3,700	2,500	8,160	5,080	16,600	47,200	15,000	5,300	5,300
13.....	5,760	4,980	1,000	3,780	2,500	9,220	4,880	15,500	51,800	14,000	4,980	5,190
14.....	5,870	4,500	996	3,780	2,500	10,400	4,830	15,000	53,200	13,100	4,780	4,980
15.....	5,760	4,400	1,100	3,780	2,650	12,600	4,780	14,000	54,000	11,700	4,780	4,980
16.....	5,750	4,210	1,200	3,550	2,800	12,600	4,680	13,500	56,200	10,800	4,210	4,780
17.....	5,750	4,500	1,400	3,480	3,000	10,400	4,780	12,100	60,000	10,200	4,300	4,980
18.....	5,990	5,190	1,520	3,060	3,200	9,220	4,980	11,200	59,200	9,600	4,300	5,750
19.....	6,110	5,870	1,600	2,940	3,340	9,600	5,080	11,200	60,000	9,040	3,300	5,630
20.....	6,360	5,750	1,750	2,740	3,340	8,680	5,990	11,700	59,200	8,330	4,300	5,520
21.....	6,620	5,630	2,480	2,620	3,340	7,820	6,360	12,100	54,800	7,660	4,500	5,300
22.....	6,760	5,520	3,200	2,620	3,620	7,050	7,820	12,100	51,800	7,050	4,680	5,190
23.....	7,200	5,300	3,240	2,940	3,410	6,760	7,200	14,000	48,800	6,760	4,980	5,300
24.....	7,660	5,300	3,270	3,200	3,480	6,620	7,050	18,300	44,300	6,760	5,190	5,190
25.....	7,050	5,300	3,410	3,340	3,780	5,990	7,200	21,800	41,300	6,760	5,520	5,190
26.....	6,760	5,190	3,410	3,550	4,210	5,750	9,040	21,800	37,600	6,360	5,750	5,080
27.....	6,490	5,080	3,340	3,550	4,300	5,520	9,410	21,200	34,700	5,870	6,360	5,300
28.....	6,360	4,980	3,270	3,620	4,780	5,410	9,410	21,200	32,600	5,300	9,160	5,520
29.....	5,990	4,980	3,270	3,700	-----	5,410	10,000	24,300	30,500	4,880	19,500	5,520
30.....	5,990	4,980	3,200	3,700	-----	5,520	10,600	24,300	28,400	4,780	23,000	5,520
31.....	5,870	-----	3,130	3,620	-----	5,630	-----	23,700	-----	4,590	21,200	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	7,660	4,500	5,880	362,000
November.....	5,990	4,210	5,290	315,000
December.....	4,980	996	2,920	180,000
January.....	3,860	2,620	3,420	210,000
February.....	4,780	2,500	3,360	187,000
March.....	15,300	5,410	8,440	519,000
April.....	10,600	4,680	6,240	371,000
May.....	24,300	11,200	16,300	1,000,000
June.....	60,000	23,000	45,400	2,700,000
July.....	27,700	4,590	12,600	775,000
August.....	23,000	4,210	6,710	413,000
September.....	14,400	4,780	6,230	371,000
The year.....	60,000	996	10,200	7,400,000

YELLOWSTONE RIVER AT GLENDIVE, MONT.

LOCATION.—Chain gage on highway bridge at Glendive, Mont.

DRAINAGE AREA.—66,800 square miles.

RECORDS AVAILABLE.—July 1897 to December 1910 (only gage heights prior to 1903), October 1931 to September 1933. January 1911 to September 1931 at Lower Yellowstone Dam at Intake, 18 miles downstream.

DISCHARGE.—Maximum during year, 64,800 second-feet June 20, maximum gage height, 17.03 feet Mar. 8, 1933, ice jam; minimum, 1,060 second-feet Dec. 14 (ice on control).

1897-1933: Maximum, 159,000 second-feet June 21, 1921 (gage height, 12.6 feet at Intake); maximum gage height, that of Mar. 8, 1933; minimum, that of Dec. 14, 1932.

REMARKS.—Records good except those for period of ice effect, Nov. 13 to Mar. 8, which are fair. Numerous diversions above station. Some storage on tributaries.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	6,310	6,310	5,980	3,650	3,400	5,980	7,080	12,100	24,800	28,800	4,730	24,000
2-----	6,310	6,310	6,650	3,650	3,400	8,850	7,400	13,900	28,000		4,730	15,600
3-----	5,980	6,310	7,360	3,650	3,400	10,800	7,080	16,200	37,200		4,730	11,600
4-----	5,650	5,980	5,980	3,910	3,400	14,000	6,470	18,000	45,300		4,500	10,500
5-----	5,330	5,980	5,330	4,170	3,400	12,000	6,180	16,200	51,600	23,400	4,730	9,380
6-----	5,330	5,980	5,330	3,910	3,160	10,400	5,910	14,400	53,800		4,730	8,700
7-----	5,330	5,980	4,720	3,910	2,930	11,200	5,660	15,000	53,800		5,190	8,040
8-----	5,330	5,650	3,650	3,650	2,820	16,800	5,910	18,000	52,700		5,420	7,400
9-----	5,330	5,650	2,500	3,910	2,930	11,600	5,910	19,900	50,600	18,000	6,770	6,770
10-----	5,980	5,650	2,020	3,650	2,930	10,500	5,910	19,900	47,400	16,200	6,770	6,470
11-----	5,980	5,650	1,930	3,650	2,820	8,370	6,180	19,900	42,200	15,600	6,470	6,180
12-----	6,310	5,650	1,680	3,910	2,820	11,600	6,180	18,600	45,300	15,000	5,910	5,910
13-----	6,650	5,330	1,120	4,170	2,820	18,000	5,910	17,400	52,700	14,400	5,660	5,910
14-----	6,310	5,020	1,060	4,170	2,820	26,300	5,420	16,800	57,000	13,400	5,190	6,180
15-----	6,310	4,440	1,180	4,170	2,930	24,800	5,420	16,800	59,200	12,500	5,190	6,180
16-----	6,310	4,440	1,310	3,910	3,160	23,300	5,660	17,400	58,100	11,200	4,960	6,470
17-----	5,980	4,440	1,520	3,400	3,160	24,000	5,420	16,800	59,200	10,800	4,270	5,660
18-----	6,310	4,170	1,760	3,160	3,160	19,300	5,420	15,000	61,400	10,100	4,500	5,660
19-----	6,310	5,650	1,760	3,160	3,160	12,100	6,180	13,400	61,400	9,730	4,500	6,470
20-----	6,310	6,310	2,400	3,160	3,160	10,100	6,770	13,400	63,700	9,040	4,500	6,180
21-----	7,000	6,650	2,500	3,160	3,400	9,730	7,720	13,900	59,200	8,370	4,500	6,180
22-----	7,730	5,980	2,930	3,400	3,400	8,370	8,700	14,400	54,900	8,040	4,730	5,910
23-----	8,470	5,980	3,400	3,160	3,400	7,720	10,800	17,400	51,600	7,400	4,960	5,660
24-----	10,800	5,980	3,400	3,160	3,650	7,720	9,040	29,700	47,400	7,400	5,420	5,660
25-----	10,400	5,330	3,650	3,160	3,650	7,720	8,700	35,200	43,200	7,400	5,660	5,660
26-----	8,470	5,020	3,650	3,400	4,170	6,770	9,040	33,300	39,200	7,080	5,910	5,420
27-----	8,100	5,020	3,650	3,400	5,330	6,470	10,500	27,100	37,200	6,770	6,180	5,420
28-----	7,360	5,330	3,400	3,400	5,330	6,770	11,200	24,800	34,200	6,180	6,770	5,660
29-----	7,000	5,650	3,400	3,400	-----	7,400	11,200	25,600	31,400	5,660	10,100	5,910
30-----	6,310	5,980	3,400	3,400	-----	7,400	11,600	28,800	28,800	5,190	25,600	5,910
31-----	6,310	-----	3,400	3,400	-----	7,080	-----	27,100	-----	4,960	25,600	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	10,800	5,330	6,700	412,000
November-----	6,650	4,170	5,590	333,000
December-----	7,360	1,060	3,290	202,000
January-----	4,170	3,160	3,590	221,000
February-----	5,330	2,820	3,360	187,000
March-----	26,300	5,980	12,000	738,000
April-----	11,600	5,420	7,350	437,000
May-----	35,200	12,100	19,600	1,210,000
June-----	63,700	24,800	47,800	2,840,000
July-----	28,800	4,960	13,600	836,000
August-----	25,600	4,270	6,740	414,000
September-----	24,000	5,420	7,560	450,000
The year-----	63,700	1,060	11,400	8,280,000

TOWER CREEK AT TOWER FALLS, YELLOWSTONE NATIONAL PARK

LOCATION.—Staff gage a short distance above Tower Falls, a quarter of a mile above mouth, and 2 miles southeast of Camp Roosevelt. On July 12, 1933, a new staff gage was installed 75 feet above temporary location established Sept. 26, 1931, and 25 feet above original staff, and was used continuously thereafter. No datum relation between the two gages.

DRAINAGE AREA.—51 square miles.

RECORDS AVAILABLE.—September 1922 to September 1933.

EXTREMES.—Maximum and minimum discharges during year occurred during period of no gage-height record.

1922-33: Maximum discharge, 642 second-feet May 30, 1925 (gage height, 6.16 feet); maximum gage height, 6.27 feet May 28, 1928; minimum discharge, 13 second-feet May 6, 1924 (gage height, 3.38 feet).

REMARKS.—Records fair except those for June 15 to July 12, which are probably poor; discharge estimated June 15 to July 12, Sept. 13-15 and 17-30. No diversions or regulation. Gage observations furnished by officials of Yellowstone National Park.

Discharge, in second-feet, 1932-33

Day	Oct.	Mar.	May	June	July	Aug.	Sept.
1						41	25
2						37	23
3					75	39	25
4						35	25
5						32	25
6						32	23
7						32	23
8	* 22				61	32	25
9						32	26
10						30	25
11						30	25
12					54	30	23
13					48	29	
14					52	28	24
15				300	50	28	
16					51	28	25
17					51	27	
18				250	48	27	25
19					45	32	
20					44	30	
21					41	28	
22					42	29	
23				150	42	28	24
24					47	28	
25		* 16			39	30	
26					39	41	
27			* 79		39	32	
28				100	37	32	23
29					35	30	
30					35	29	
31					35	27	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
June 15-30			175	3.43	2.04	5,550
July		35	51.7	1.01	1.16	3,180
August	41	27	31.1	.61	.70	1,910
September			24.2	.475	.53	1,440
The period						12,100

* Result of discharge measurement.

LAMAR RIVER NEAR TOWER FALLS RANGER STATION, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder half a mile north of Cooke City road, three-quarters of a mile above mouth, and 2 miles northeast of Tower Falls ranger station.

DRAINAGE AREA.—540 square miles.

RECORDS AVAILABLE.—September 1922 to September 1933.

EXTREMES.—Maximum discharge during year, 9,340 second-feet June 12 (gage height, 8.06 feet); minimum recorded, 95 second-feet (discharge measurement) Mar. 25.

1922-33: Maximum discharge, 13,600 second-feet May 25, 1928 (gage height, 9.75 feet); minimum, that of Mar. 25, 1933.

REMARKS.—Records good except those estimated, Dec. 8 to Mar. 24, Mar. 26 to May 14, and May 16, 17, which are poor. No regulation or diversions. Gage observations furnished by officials of Yellowstone National Park.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	157	153	199						5,036	1,500	268	188
2.....	157	151	204						5,820	1,360	372	183
3.....	155	142	202					200	6,240	1,320	354	178
4.....	151	126	196						5,626	1,220	307	171
5.....	144	144	178						5,220	1,140	262	162
6.....	142	149	151					210	4,940	1,070	242	160
7.....	149	138	142						5,220	1,020	233	155
8.....	157	128				110	100		4,560	964	230	151
9.....	155	155							5,220	988	236	157
10.....	149	155							6,870	891	227	155
11.....	157	171						200	7,530	814	215	146
12.....	164	191							7,750	714	202	142
13.....	176	174							7,970	657	193	142
14.....	169	153							7,530	608	186	142
15.....	162	164			120			183	7,530	573	181	166
16.....	160	174		130					7,310	550	176	191
17.....	174	162						400	6,660	550	164	169
18.....	169	166						125	6,240	501	162	155
19.....	151	169	140						5,420	455	186	149
20.....	132	164				100			4,470	440	224	140
21.....	136	153						1,180	3,870	412	196	136
22.....	144	149						1,640	3,400	380	204	132
23.....	151	157						1,400	3,110	358	210	128
24.....	138	289						1,360	2,770	347	191	134
25.....	130	346				95		1,740	2,510	330	188	160
26.....	149	322						2,450	2,390	314	296	164
27.....	153	289						2,450	2,160	307	496	153
28.....	153	255				100	175	1,790	2,050	303	367	151
29.....	128	221						2,160	1,890	282	265	166
30.....	146	215						3,480	1,740	268	224	169
31.....	162							4,560		262	202	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	176	128	152	0.238	0.27	9,350
November.....	346	126	184	.288	.32	10,900
December.....	204		149	.233	.27	9,160
January.....			130	.203	.23	7,990
February.....			120	.188	.20	6,660
March.....			105	.164	.19	6,460
April.....			125	.195	.22	7,440
May.....	4,560		969	1.51	1.74	59,500
June.....	7,970	1,740	4,970	7.77	8.67	296,000
July.....	1,500	262	674	1.05	1.21	41,490
August.....	496	162	241	.377	.43	14,800
September.....	191	128	156	.244	.27	9,280
The year.....	7,970		661	1.03	14.02	479,000

• Result of discharge measurement.

GARDINER RIVER AT MAMMOTH HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder a quarter of a mile below footbridge on Mount Everts trail, three-eighths of a mile below Mammoth Hot Springs, and 0.9 mile east of Mammoth Hotel.

DRAINAGE AREA.—201 square miles.

RECORDS AVAILABLE.—September 1922 to September 1933.

EXTREMES.—Maximum discharge during year, 1,070 second-feet June 11 (gage height 2.86 feet); minimum, somewhat less than 50 second-feet in March.

1922-33: Maximum discharge, 1,790 second-feet May 28, 1928 (gage height, 3.59 feet); minimum discharge, 31 second-feet Apr. 7, 1928; minimum gage height, 0.51 foot Apr. 3, 1931.

REMARKS.—Records good except those estimated, Nov. 12 to May 6, which are fair. No regulation or diversions. Gage observations furnished by officials of Yellowstone National Park.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1.....	88	86							674	331	115	90
2.....	86	86							744	298	122	90
3.....	86	85							800	282	115	88
4.....	86	81						125	779	267	113	88
5.....	86	85							751	255	106	88
6.....	86	85							751	248	104	86
7.....	92	83						108	779	241	104	86
8.....	94	80				60	50	102	737	234	104	88
9.....	94	88						98	822	230	104	100
10.....	92	81						90	899	220	102	92
11.....	98							88	964	199	102	88
12.....	100	78						88	947	189	98	86
13.....	96							88	972	180	96	85
14.....	94							96	998	177	96	86
15.....	92							120	964	170	96	113
16.....	94	80	70	70	60			153	939	167	92	98
17.....	98							177	947	164	92	90
18.....	92							183	868	158	92	88
19.....	85							183	772	150	108	88
20.....	85						50	192	667	147	100	85
21.....	88							245	595	142	96	83
22.....	88							278	547	139	100	81
23.....	88					50	100	271	502	136	96	81
24.....	81							259	465	131	92	88
25.....	81							294	435	129	100	106
26.....		75										
27.....	90							343	406	126	134	98
28.....	90					50		348	383	124	120	92
29.....	90						125	302	430	122	106	92
30.....	80							323	425	117	98	90
31.....	85							460	383	113	94	86
.....	76							602		113	92	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	100	76	89.1	0.443	0.51	5,480
November.....	88		79.6	.396	.44	4,740
December.....			70.0	.348	.40	4,300
January.....			70.0	.348	.40	4,300
February.....			60.0	.299	.31	3,330
March.....			54.8	.273	.31	3,370
April.....			75.0	.373	.42	4,460
May.....		88	201.0	1.00	1.15	12,400
June.....	602	383	712	3.54	3.95	42,400
July.....	998	113	184	.915	1.05	11,300
August.....	331	92	103	.512	.59	6,330
September.....	134	81	90	.448	.50	5,360
The year.....	113					
	998		149	.741	10.03	108,000

* Result of discharge measurement.

SHIELDS RIVER AT CLYDE PARK, MONT.

LOCATION.—Wire gage in NW¼ sec. 33, T. 2 N., R. 9 E., at highway bridge three-quarters of a mile west (revised) of Clyde Park, 1½ miles above mouth of Brackett Creek.

DRAINAGE AREA.—544 square miles.

RECORDS AVAILABLE.—March 1921 to September 1923; April 1929 to December 1932 (discontinued).

DISCHARGE.—Maximum discharge during year, 69 second-feet Oct. 18, 1932 (gage height, 1.56 feet); minimum, 24 second-feet Oct. 3-4 (gage height, 1.28 feet).

1921-23, 1929-32: Maximum, 1,880 second-feet May 26, 1923; minimum, 4.3 second-feet Sept. 4-9, 1931 (gage height, 0.90 foot).

REMARKS.—Records good except those for period of ice effect, Dec. 6-31, which are fair. Numerous diversions above and below station.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1.....	26	61	65	11.....	43	63	47	21.....	61	65	50
2.....	26	61	69	12.....	45	61	47	22.....	61	65	47
3.....	24	57	69	13.....	50	61	47	23.....	61	65	47
4.....	24	57	57	14.....	50	57	43	24.....	61	69	43
5.....	26	57	61	15.....	50	57	40	25.....	61	69	43
6.....	29	61	57	16.....	54	57	43	26.....	61	69	43
7.....	32	61	54	17.....	65	61	43	27.....	65	57	43
8.....	34	61	50	18.....	69	61	47	28.....	63	61	40
9.....	39	65	47	19.....	63	57	47	29.....	61	65	40
10.....	40	65	47	20.....	63	61	50	30.....	65	65	43
								31.....	63	-----	43

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	69	24	49.5	3,040
November.....	69	57	61.7	3,670
December.....	69	40	48.8	3,000
The period.....				9,710

CLARKS FORK AT CHANCE, MONT.

LOCATION.—Staff gage in NW¼ sec. 32, T. 9 S., R. 22 E., on highway bridge at Chance, just above mouth of Sand Coulee and half a mile north of the Wyoming-Montana State line.

RECORDS AVAILABLE.—July 1921 to July 1933 (discontinued).

DISCHARGE.—Maximum during year, 7,730 second-feet June 13 (gage height, 5.45 feet); minimum, 99 second-feet Apr. 9 (gage height, 0.35 foot).

1921-33: Maximum, 10,900 second-feet May 26, 1928 (gage height, 6.5 feet); minimum, 72 second-feet Mar. 19, 1927 (gage height, 0.50 foot).

REMARKS.—Records good. Stage-discharge relation affected by ice Dec. 6-31. No record Jan. 1 to Mar. 31. Numerous diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Apr.	May	June	July
1.....	196	208	208	410	632	4, 100	2, 260
2.....	196	208	208	410	551	4, 600	810
3.....	196	208	208	296	551	5, 100	770
4.....	183	208	208	150	604	4, 850	729
5.....	160	196	222	150	551	4, 600	729
6.....	160	183	140	131	526	4, 600	729
7.....	160	172		114	410	5, 100	1, 140
8.....	183	183		122	369	4, 850	1, 480
9.....	208	235		103	331	5, 100	1, 640
10.....	196	264	110	106	331	6, 130	1, 480
11.....	196	264		106	331	6, 920	1, 410
12.....	196	264		106	296	7, 190	1, 200
13.....	208	280		106	296	7, 190	1, 080
14.....	208	264		106	296	6, 650	1, 020
15.....	208	264	130	122	350	6, 920	1, 020
16.....	208	264		150	369	6, 650	1, 020
17.....	196	250		183	390	5, 870	770
18.....	208	235		183	454	6, 390	695
19.....	208	235		183	501	5, 870	661
20.....	208	235	150	196	526	5, 350	578
21.....	196	264		172	632	4, 850	526
22.....	196	264		183	1, 340	4, 350	478
23.....	196	264		208	1, 140	3, 850	-----
24.....	196	264		222	1, 270	3, 600	-----
25.....	196	250	150	296	1, 340	3, 120	-----
26.....	196	222		331	1, 980	3, 120	-----
27.....	183	208		604	2, 360	3, 120	-----
28.....	183	222		729	1, 890	2, 890	-----
29.....	183	208		1, 020	2, 160	2, 670	-----
30.....	183	196	150	964	2, 260	2, 670	-----
31.....	196	-----		-----	3, 120	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	208	160	193	11, 900
November.....	280	172	233	13, 900
December.....	222	-----	149	9, 160
April.....	1, 020	103	272	16, 200
May.....	3, 120	296	908	55, 800
June.....	7, 190	2, 670	4, 940	294, 000
July 1-22.....	2, 260	478	1, 010	44, 100

CLARKS FORK AT EDGAR, MONT.

LOCATION.—Wire gage in SW¼ sec. 24, T. 4 S., R. 23 E., at highway bridge half a mile east of Edgar.

RECORDS AVAILABLE.—July 1921 to March 1933 (discontinued).

DISCHARGE.—Maximum during year, 930 second-feet Mar. 11; minimum, 190 second-feet Dec. 7 (gage height, 1.60 feet).

1921-33: Maximum, 10,600 second-feet May 26, 1928 (gage height, 8.25 feet); minimum, 41 second-feet July 25, 1931 (gage height, 1.55 feet).

REMARKS.—Records good except those for ice period, Dec. 8 to Mar. 12, which are fair. Numerous diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1.....	330	430	405	382	279	454	16.....	405	430	302	260	260	302
2.....	330	405	405	382	279	640	17.....	405	454	302	240	252	302
3.....	364	405	382	382	260	640	18.....	430	454	330	260	252	316
4.....	330	405	382	405	270	640	19.....	430	430	330	279	279	302
5.....	330	405	405	405	270	540	20.....	454	430	330	290	279	290
6.....	347	430	364	382	270	640	21.....	405	405	347	316	330	279
7.....	364	405	215	405	191	714	22.....	405	430	347	302	330	290
8.....	364	430	214	430	196	795	23.....	405	405	364	279	302	279
9.....	405	430	290	382	215	714	24.....	405	405	364	279	330	279
10.....	405	454	330	364	215	714	25.....	430	382	364	279	330	270
11.....	405	405	330	347	238	795	26.....	405	405	347	290	330	279
12.....	405	382	330	316	229	571	27.....	405	405	364	302	347	270
13.....	382	382	330	302	229	382	28.....	430	405	364	302	364	270
14.....	405	482	316	302	235	330	29.....	405	405	382	302	-----	279
15.....	405	430	302	316	244	302	30.....	454	405	382	290	-----	279
							31.....	405	-----	382	279	-----	290

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	454	330	395	24,300
November.....	454	382	418	24,900
December.....	405	214	342	21,000
January.....	430	240	324	19,900
February.....	364	191	272	15,100
March.....	795	270	434	26,700
The period.....	-----	-----	-----	132,000

ROCK CREEK NEAR RED LODGE, MONT.

LOCATION.—Staff gage in SW¼ sec. 17, T. 8 S., R. 20 E., at highway bridge at United States ranger station 4 miles southwest of Red Lodge.

RECORDS AVAILABLE.—April to December 1932 (discontinued).

DISCHARGE.—Maximum during period of record, 955 second-feet May 21, June 15, 24 (gage height, 3.80 feet); minimum, 32 second-feet Apr. 15, May 1 (gage height, 1.12 feet).

REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 6-8. Several diversions above gage.

Discharge, in second-feet, of Rock Creek near Red Lodge, Mont., 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.		
1.....	73	61	40	11.....	73	51	43	21.....	61	51	37		
2.....	73	61	40	12.....	73	51	43	22.....	61	51	37		
3.....	73	61	40	13.....	73	56	40	23.....	51	43	37		
4.....	73	51	40	14.....	61	51	40	24.....	51	43	37		
5.....	73	51	40	15.....	61	51	40	25.....	73	43	34		
6.....	73	51	35	16.....	61	51	40	26.....	61	43	34		
7.....	73	51		17.....	61	51	37	27.....	61	43	34		
8.....	73	51		18.....	61	51	37	28.....	51	43	34		
9.....	73	51		19.....	61	51	37	29.....	51	43	34		
10.....	73	51	43	20.....	61	51	37	30.....	51	43	34		
								31.....	51	-----	34		
Month				Maximum				Minimum		Mean		Run-off in acre-feet	
October.....				73				51		64.5		3,970	
November.....				61				43		50.0		2,980	
December.....				43				34		37.8		2,320	
The period.....												9,270	

ROCK CREEK AT ROCKVALE, MONT.

LOCATION.—Wire gage in NW¼ sec. 2, T. 4 S., R. 23 E., at highway bridge a quarter of a mile south of Rockvale. Relation to 1920-22 datum not determined.

RECORDS AVAILABLE.—October 1920 to September 1922; April 1932 to March 1933 (discontinued).

DISCHARGE.—Maximum during year, 347 second-feet Mar. 13; maximum gage height, 7.17 feet (ice effect); minimum, 43 second-feet Jan. 14 (gage height, 5.44 feet, ice effect).

1920-22, 1932-33: Maximum, 2,310 second-feet June 8, 1932 (gage height, 8.10 feet); minimum, 0.6 second-foot July 16, 1921.

REMARKS.—Records good. Stage-discharge relation affected by ice Dec. 11 to Mar. 10. Numerous diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1.....	119	244	166	119	52	93	16.....	227	240	114	46	59	204
2.....	93	264	156	162	63	84	17.....	244	240	103	59	65	204
3.....	119	248	149	114	66	98	18.....	277	244	114	66	86	244
4.....	137	248	156	114	56	169	19.....	277	227	109	59	86	182
5.....	162	219	146	125	66	156	20.....	282	235	131	66	111	162
6.....	162	227	166	137	54	175	21.....	264	227	137	56	98	169
7.....	175	227	125	182	50	156	22.....	307	208	125	52	79	162
8.....	235	223	125	169	52	227	23.....	312	200	114	66	88	137
9.....	269	215	93	131	52	227	24.....	277	186	169	66	75	156
10.....	286	231	52	131	52	303	25.....	252	208	109	52	84	143
11.....	286	169	52	137	57	235	26.....	256	212	119	74	90	149
12.....	260	149	93	70	56	163	27.....	248	212	119	98	99	169
13.....	235	240	109	66	54	347	28.....	248	204	131	88	100	182
14.....	235	196	162	43	57	286	29.....	235	186	125	93	-----	219
15.....	227	193	149	46	54	252	30.....	277	172	137	70	-----	204
							31.....	219	-----	131	79	-----	182
Month						Maximum		Minimum		Mean		Run-off in acre-feet	
October.....						312		93		232		14,300	
November.....						264		149		216		12,900	
December.....						169		52		125		7,690	
January.....						182		43		91.5		5,630	
February.....						111		50		70.0		3,890	
March.....						347		84		189		11,600	
The period.....						-----		-----		-----		56,000	

WEST FORK OF ROCK CREEK NEAR RED LODGE, MONT.

LOCATION.—Wire gage on highway bridge in SE¼ sec. 6, T. 8 S., R. 20 E., at United States ranger station 3 miles southwest of Red Lodge.

RECORDS AVAILABLE.—April to December 1932 (discontinued).

DISCHARGE.—Maximum during period, 861 second-feet June 24-25, 1932 (gage height, 3.96 feet); minimum, 12 second-feet Oct. 10, 1932 (gage height, 1.06 feet).

REMARKS.—Records good. Discharge interpolated Oct. 2, Nov. 12, Dec. 19. Several small diversions above gage.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1-----	15	20	24	11-----	12	24	22	21-----	23	25	21
2-----	14	28	24	12-----	13	27	22	22-----	30	25	21
3-----	14	28	24	13-----	13	30	24	23-----	30	23	21
4-----	14	23	24	14-----	15	28	25	24-----	29	28	22
5-----	14	28	23	15-----	13	21	24	25-----	25	25	22
6-----	13	28	20	16-----	14	28	23	26-----	25	25	21
7-----	13	26	15	17-----	14	26	23	27-----	27	25	21
8-----	13	26	15	18-----	19	27	24	28-----	29	26	21
9-----	13	28	15	19-----	21	25	23	29-----	27	24	21
10-----	12	25	20	20-----	21	26	22	30-----	31	25	21
								31-----	29		21

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	31	12	19.4	1,190
November-----	30	21	26.1	1,550
December-----	25	15	21.6	1,330
The period-----				4,070

RED LODGE CREEK NEAR BOYD, MONT.

LOCATION.—Wire gage in SW¼ sec. 26, T. 4 S., R. 21 E., about 1½ miles west of Boyd. (Gage datum changed June 19, 1932; relation to old datum unknown.)

RECORDS AVAILABLE.—April to December 1932 (discontinued).

DISCHARGE.—Maximum during period of record, 1,400 second-feet June 8 (gage height, 7.34 feet, old datum); minimum, 8.0 second-feet Dec. 7 (gage height, 1.94 feet).

REMARKS.—Records good. Stage-discharge relation affected by ice Dec. 10-31. Numerous diversions above gage.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1-----	56	43	21	11-----	56	28		21-----	43	31	
2-----	56	40	21	12-----	56	29		22-----	46	28	
3-----	54	40	23	13-----	54	32		23-----	46	21	
4-----	60	37	23	14-----	52	33		24-----	46	28	
5-----	56	31	22	15-----	47	17	25	25-----	47	28	
6-----	51	36	18	16-----	44	37		26-----	40	26	
7-----	54	34	9	17-----	44	36		27-----	39	19	
8-----	54	33	13	18-----	51	34		28-----	39	23	
9-----	52	37	20	19-----	49	33		29-----	39	25	
10-----	56	37	25	20-----	44	33		30-----	41	23	
								31-----	33		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	60	33	48.5	2,980
November-----	43	17	31.1	1,850
December-----	25	9	23.2	1,430
The period-----				6,260

WIND RIVER AT RIVERTON, WYO.

LOCATION.—Water-stage recorder in sec. 2, T. 1 S., R. 4 E., three-quarters of a mile east of Riverton. Zero of gage is 4,844.38 feet above mean sea level.

DRAINAGE AREA.—2,320 square miles.

RECORDS AVAILABLE.—May 1906 to November 1908; May 1911 to September 1927; October 1928 to September 1933.

DISCHARGE.—Maximum during year, 9,510 second-feet June 14 (gage height, 7.20 feet); minimum, 123 second-feet Dec. 10 (gage height, 2.24 feet).

1906-8, 1911-27, 1929-33: Maximum, 12,300 second-feet June 14, 1906; minimum, that of Dec. 10, 1932.

REMARKS.—Records good except those for period of ice effect, Dec. 11 to Mar. 4, which were based on two discharge measurements, temperature records, and comparison with Big Horn River at Thermopolis. Several irrigation diversions above station. Gage-height record furnished by United States Bureau of Reclamation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	280	332	338	270	240	295	161	1,010	2,980	2,570	922	572
2	319	326	338				236	680	5,020	2,200	1,020	572
3	326	345	326	274		306	236	760	6,020	1,900	1,010	554
4	360	326	332				269	812	5,900	1,780	988	527
5	428	293	312				274	812	5,820	1,770	977	509
6	306	280	306	305	225	312	247	680	5,580	1,750	889	527
7	319	306	230				319	236	4,980	1,960	790	750
8	390	269	189				312	252	4,550	2,110	700	856
9	428	252	164				300	247	4,190	2,300	630	911
10	452	300	139				306	230	4,760	2,410	600	878
11	444	286	145	260	165	306	225	572	7,280	2,280	600	801
12	452	252					345	220	8,320	2,160	590	770
13	396	312					332	230	8,350	1,910	563	867
14	420	368					306	236	8,990	1,740	554	720
15	436	338					306	236	8,320	1,580	554	700
16	352	300	195	225	215	280	236	436	8,000	1,470	536	710
17	398	306					326	242	7,170	1,420	563	690
18	476	319					368	242	509	7,110	1,320	650
19	500	332					300	252	536	6,730	1,280	710
20	468	368					300	312	545	6,260	1,180	740
21	420	368	275	250	255	286	398	563	5,380	1,110	710	518
22	452	360					242	382	944	4,920	1,030	690
23	460	345					225	452	1,240	4,240	944	680
24	460	319					225	545	1,150	3,580	889	590
25	428	319					225	563	1,190	3,440	760	518
26	375	326	295	245	275	225	590	1,510	3,390	770	700	405
27	428	326					220	680	1,940	3,350	760	878
28	390	326					225	922	1,920	3,260	780	944
29	412	332					230	1,150	1,700	3,110	823	834
30	368	338					225	1,280	2,060	2,870	823	720
31	338					150		3,050		845	630	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	500	280	403	24,800
November	368	252	319	19,000
December	338		243	14,900
January			259	15,900
February			225	12,600
March	368	150	280	17,200
April	1,280	161	393	23,400
May	3,050	428	944	58,000
June	8,990	2,870	5,470	325,000
July	2,570	760	1,510	92,800
August	1,020	518	725	44,600
September	911	332	591	35,200
The year	8,900		944	683,000

BIG HORN RIVER AT THERMOPOLIS, WYO.

LOCATION.—Chain gage in sec. 36, T. 43 N., R. 95 W., at Thermopolis. Zero of gage is 4,304.80 feet above mean sea level.

DRAINAGE AREA.—8,080 square miles.

RECORDS AVAILABLE.—May 1900 to December 1905; June 1910 to September 1933.

DISCHARGE.—Maximum during year, 15,500 second-feet June 15 (gage height, 9.88 feet); minimum (estimated), 315 second-feet Dec. 11.

1900-1905, 1910-33: Maximum, 29,800 second-feet July 24, 1923 (gage height, 16.2 feet); minimum, 180 second-feet Apr. 5, 1904 (gage height, 0.2 foot).
REMARKS.—Records fair except those estimated for periods of ice effect, Dec. 11-23, Feb. 5-15, and those for periods of no gage-height record, May 16-19, Sept. 24-30, which are fair. Practically no diversions between mouth of Wind River and Thermopolis.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	485	780	557	465	416	440	628	2,380	6,300	4,170	924	1,090
2.....	480	748	599	465	420	455	585	2,400	7,880	3,590	1,020	959
3.....	460	732	652	450	416	496	550	2,430	9,320	3,040	1,030	924
4.....	465	668	652	432	408	520	550	2,310	10,000	2,890	995	942
5.....	508	644	592	416	412	544	571	2,000	9,920	2,660	1,080	977
6.....	460	620	508	436	380	564	606	1,750	9,920	2,380	1,050	1,030
7.....	460	606	440	432	360	582	652	1,640	9,520	2,510	1,020	1,080
8.....	485	620	391	432	340	628	676	1,590	8,640	2,590	822	1,140
9.....	514	644	342	428	320	684	660	1,380	8,240	2,960	772	1,120
10.....	564	606	328	436	320	724	578	1,520	7,680	3,320	764	1,110
11.....	606	599	315	440	330	716	532	1,390	9,500	2,950	652	1,140
12.....	620	652	320	450	340	724	514	1,430	11,500	2,830	636	1,180
13.....	636	716	320	440	335	740	485	1,550	12,900	2,550	606	1,120
14.....	620	716	320	450	330	780	485	1,670	13,700	2,320	571	1,080
15.....	620	748	330	460	339	865	538	1,770	15,000	2,350	571	1,020
16.....	636	668	340	450	348	908	526	1,740	14,800	1,980	564	977
17.....	606	613	350	440	348	882	550	1,720	13,500	1,520	550	959
18.....	692	599	340	440	350	874	636	1,720	13,400	1,710	557	959
19.....	797	652	350	440	352	924	724	1,700	13,200	1,560	636	924
20.....	831	668	370	440	360	916	748	1,630	12,700	1,410	732	890
21.....	848	684	380	432	370	831	924	1,630	11,800	1,320	764	856
22.....	780	716	390	432	368	748	1,020	1,660	10,100	1,180	732	822
23.....	772	708	400	432	379	684	1,030	1,780	7,680	1,070	684	788
24.....	780	636	412	432	368	585	1,070	1,990	6,970	1,010	740	800
25.....	764	526	420	432	368	557	1,230	2,250	5,830	959	780	810
26.....	692	592	408	424	370	571	1,500	2,450	5,300	908	2,830	820
27.....	684	652	424	420	370	564	1,670	2,720	5,180	840	6,890	840
28.....	724	644	428	424	385	592	1,940	3,120	4,730	831	6,490	845
29.....	740	606	424	424	-----	620	2,100	3,930	4,220	831	1,970	850
30.....	780	538	450	428	-----	628	2,320	4,650	4,730	882	1,190	850
31.....	780	-----	470	432	-----	606	-----	5,410	-----	874	1,140	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	848	460	642	39,500
November.....	780	526	653	38,900
December.....	752	315	420	25,800
January.....	465	416	437	26,900
February.....	420	320	364	20,200
March.....	924	440	676	41,600
April.....	2,230	485	887	52,800
May.....	5,410	1,390	2,170	133,000
June.....	15,000	4,220	9,470	564,000
July.....	4,170	831	2,000	123,000
August.....	6,890	550	1,280	78,700
September.....	1,180	788	963	57,300
The year.....	15,000	315	1,660	1,200,000

BIG HORN RIVER AT KANE, WYO.

LOCATION.—Water-stage recorder in sec. 4, T. 56 N., R. 93 W., half a mile east of Kane. Zero of gage is 3,610.23 feet above mean sea level.

DRAINAGE AREA.—15,900 square miles.

RECORDS AVAILABLE.—August 1923 to September 1933.

DISCHARGE.—Maximum during year, 19,300 second-feet June 16 (gage height, 9.39 feet); minimum, not determined, occurred during winter.

1928-33: Maximum, that of June 16, 1933; minimum, 250 second-feet July 19, 1931 (gage height, 0.00 foot).

REMARKS.—Records good except those for the periods July 5-6, Aug. 16-26, Aug. 30 to Sept. 2, Sept. 4, 5, 7-10, 11, which are estimated, and those for periods of ice effect, Nov. 13-23, Dec. 2-5, Dec. 7 to Mar. 18, which were based on two discharge measurements, temperature records, and comparison with Big Horn River at Thermopolis. Chain gage used Sept. 6-30. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	790	1,390	1,220				1,310	4,640	8,680	5,530	730	2,000
2.....	785	1,350	1,180				1,220	4,400	11,800	5,230	760	1,800
3.....	760	1,330	1,160			700	1,100	3,820	13,600	4,570	795	1,590
4.....	730	1,320	1,100				1,080	3,560	15,900	3,870	1,270	1,800
5.....	745	1,300	1,000				1,200	4,130	16,300	3,430	1,140	1,150
6.....		805	1,280				1,160	4,380	15,600	3,070	1,140	1,030
7.....		859	1,290				1,170	3,860	14,800	2,230	1,040	1,050
8.....		968	1,230			900	1,200	3,210	13,800	2,770	968	1,070
9.....	1,020	1,210		640			1,150	2,820	12,400	2,970	853	1,080
10.....	968	1,250					1,140	2,540	12,500	3,670	795	1,100
11.....	1,010	1,220					1,140	2,360	13,600	3,670	710	1,110
12.....	1,090	1,080					1,140	2,670	15,300	3,570	660	1,540
13.....	1,120	1,100	550			1,000	1,200	3,190	16,800	3,310	624	1,810
14.....	1,140	1,100					1,120	2,920	17,400	2,970	588	1,790
15.....	1,140	1,120					1,180	2,610	17,000	2,530	554	1,770
16.....	1,140	1,050					1,330	2,570	18,300	2,330	550	1,710
17.....	1,110	1,080			536	1,250	1,450	2,640	18,800	2,270	540	1,220
18.....	1,270	950	600				1,400	2,490	17,700	2,070	550	1,190
19.....	1,480	1,050				1,560	1,480	2,480	16,400	1,830	560	1,100
20.....	1,500	1,060				1,600	1,590	2,690	15,300	1,640	680	1,180
21.....	1,650	1,100				1,630	1,640	3,000	14,400	1,470	720	1,160
22.....	1,670	1,120				1,460	1,720	3,840	12,900	1,330	700	1,050
23.....	1,790	1,200	630			1,440	1,780	4,730	11,100	1,260	680	1,000
24.....	1,740	1,260				1,390	2,020	5,410	9,900	1,220	760	972
25.....	1,580	1,220				1,280	2,150	5,340	8,850	1,170	800	1,000
26.....	1,500	1,190				1,360	2,240	5,260	8,050	1,070	3,200	1,020
27.....	1,480	1,140				1,440	2,510	5,450	7,300	904	8,680	1,030
28.....	1,400	1,180	650			1,630	2,940	6,570	6,600	873	7,350	1,050
29.....	1,370	1,210				1,650	3,400	6,500	5,850	755	6,770	1,060
30.....	1,400	1,210				1,570	4,110	6,420	5,300	715	3,500	1,030
31.....	1,400					1,400		6,900		700	2,200	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,790	730	1,210	74,400
November.....	1,390	950	1,180	70,200
December.....	1,220		728	44,800
January.....			650	40,000
February.....			550	30,500
March.....	1,650		1,170	71,900
April.....	4,110	1,080	1,640	97,600
May.....	6,900	2,360	3,980	245,000
June.....	18,800	5,300	13,100	780,000
July.....	5,560	700	2,420	149,000
August.....	8,680	540	1,640	101,000
September.....	2,000	972	1,270	75,600
The year.....	18,800		2,450	1,780,000

• Estimated.

BIG HORN RIVER NEAR HARDIN, MONT.

LOCATION.—Chain gage in NW¼ sec. 19, T. 1 S., R. 34 E., at highway bridge on Crow Indian Reservation half a mile above mouth of Little Horn River and 2 miles northeast of Hardin.

DRAINAGE AREA.—20,700 square miles.

RECORDS AVAILABLE.—June 1904 to May 1925; August 1927 to June 1933 (discontinued).

DISCHARGE.—Maximum during year, 27,400 second-feet June 18 (gage height, 9.18 feet); minimum, 353 second-feet Feb. 14 (ice present).

1904-25, 1928-33: Maximum, 45,900 second-feet Mar. 11, 1929 (gage height, 11.1 feet); minimum, that of Feb. 14, 1933 (ice present).

REMARKS.—Records good except those for periods of ice effect, Nov. 7-20, Dec. 6 to Mar. 4, which are fair. Numerous diversions. Some storage on tributary streams.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1,790	2,000	1,860	1,650	1,120	1,720	2,140	5,020	9,390
2	1,720	2,000	1,930	1,650	1,050	2,140	2,000	5,590	11,300
3	1,650	1,930	2,000	1,720	1,050	2,600	1,860	5,020	13,400
4	1,580	1,930	2,000	1,860	985	4,760	1,720	4,510	14,600
5	1,520	1,930	2,140	1,860	795	9,850	1,580	5,300	17,600
6	1,450	1,930	1,580	1,930	732	8,500	1,580	5,590	18,200
7	1,580	1,860	1,120	2,000	658	7,660	1,520	5,590	17,000
8	1,580	1,790	858	2,000	598	6,900	1,450	5,590	17,000
9	1,650	1,790	732	2,000	562	6,210	1,450	6,210	16,400
10	1,720	2,000	490	1,930	490	5,020	1,580	6,210	15,200
11	1,720	2,140	490	1,930	490	4,070	1,580	6,210	14,000
12	1,720	2,000	442	1,860	454	2,930	1,580	5,590	15,200
13	1,650	1,720	408	1,860	375	3,110	1,580	5,020	17,000
14	1,580	1,520	550	1,860	353	3,290	1,580	4,760	18,200
15	1,520	1,380	610	1,790	419	3,110	1,720	4,510	21,400
16	1,580	1,180	858	1,650	478	2,930	1,930	4,510	23,300
17	1,580	1,180	1,120	1,520	514	2,760	2,000	4,070	25,300
18	1,860	1,380	1,380	1,380	670	2,600	2,290	3,870	27,400
19	2,290	1,520	1,520	1,380	732	2,440	2,600	3,670	25,300
20	2,140	1,790	1,520	1,320	795	2,140	2,760	3,670	23,300
21	2,290	2,000	1,520	1,180	858	2,000	2,930	3,480	20,700
22	2,440	2,000	1,520	1,250	985	1,930	3,110	3,870	18,800
23	2,440	1,930	1,520	1,320	1,120	2,000	3,110	8,070	17,000
24	2,440	1,930	1,450	1,320	1,180	1,860	3,290	6,900	15,800
25	2,600	1,930	1,450	1,320	1,250	1,720	3,480	6,210	13,400
26	2,440	1,930	1,520	1,250	1,180	1,860	3,670	6,550	11,300
27	2,290	1,930	1,520	1,120	1,380	1,930	3,870	6,900	10,300
28	2,000	1,930	1,650	1,130	1,520	2,140	4,070	7,660	9,390
29	2,000	1,850	1,580	1,180	-----	2,290	4,510	7,660	9,390
30	2,000	1,860	1,580	1,180	-----	2,440	4,760	7,660	8,500
31	2,000	-----	1,520	1,120	-----	2,140	-----	8,500	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,600	1,450	1,900	117,000
November	2,140	1,180	1,810	108,000
December	2,140	408	1,300	79,900
January	2,000	1,120	1,570	96,500
February	1,520	353	814	45,200
March	9,850	1,720	3,450	212,000
April	4,760	1,450	2,440	145,000
May	8,500	3,480	5,610	345,000
June	27,400	8,500	16,500	982,000
The period	-----	-----	-----	2,130,000

WILLOW CREEK NEAR CROWHEART, WYO.

LOCATION.—Water stage recorder in SW $\frac{1}{4}$ sec. 20, T. 3 N., R. 4 W., 2 miles southwest of Crowheart.

DRAINAGE AREA.—50 square miles.

RECORDS AVAILABLE.—May to October 1909, May 1921 to June 1923, April 1925 to September 1933.

DISCHARGE.—Maximum during year, 284 second-feet May 21 (gage height, 3.00 feet); minimum, not determined, occurred during winter.

1921–23, 1925–33: Maximum, 750 second-feet July 26, 1923; minimum not determined.

REMARKS.—Records good except those for the periods Oct. 9–14, 23–26, 28–31, 1932, July 31 to Aug. 4, Aug. 27 to Sept. 1, 1933, which were estimated. No records for Nov. 1, 1932, to Apr. 26, 1933. Small diversion for irrigation above station. Gage-height record furnished by United States Indian Service.

Revised discharge, in second-feet, for high-water periods in 1932

May 19.....	90	June 14.....	104	June 23.....	120
May 20.....	109	June 15.....	138	June 24.....	106
May 21.....	148	June 16.....	137	June 25.....	114
May 22.....	153	June 17.....	114	June 26.....	101
June 4.....	89	June 18.....	104	June 27.....	92
June 5.....	107	June 21.....	92		
June 6.....	94	June 22.....	109		

Discharge, in second-feet, 1932–33

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1.....	8.0		7.4	94	36	11	7.4
2.....	8.3		7.4	132	31	11	7.0
3.....	8.6		8.0	150	26	10	7.4
4.....	8.6		7.8	164	27	10	7.4
5.....	8.6		7.6	170	24	9.5	7.8
6.....	8.6		7.6	174	23	8.6	6.8
7.....	8.3		7.4	166	23	8.3	6.4
8.....	8.6		7.6	162	36	9.2	7.0
9.....	8.4		7.6	183	31	8.0	7.0
10.....	8.2		7.8	225	28	8.6	7.0
11.....	8.0		7.8	237	27	9.5	7.4
12.....	7.8		8.0	237	22	7.6	7.8
13.....	7.6		8.3	239	21	8.9	7.6
14.....	7.4		8.9	199	21	7.2	7.8
15.....	7.2		8.9	172	20	6.6	7.8
16.....	7.2		8.9	156	20	7.4	7.8
17.....	7.6		8.6	152	20	7.2	6.6
18.....	8.6		8.6	137	16	7.0	6.2
19.....	8.0		8.3	120	15	8.0	6.6
20.....	7.8		8.0	97	15	7.2	6.8
21.....	8.0		8.0	87	13	7.4	6.8
22.....	8.0		8.0	79	13	7.6	7.0
23.....	7.8		8.0	71	13	7.8	7.4
24.....	7.6		8.0	62	13	7.8	7.4
25.....	7.4		8.0	58	13	8.3	7.6
26.....	7.2		8.3	54	13	9.5	7.8
27.....	7	7.4	8.6	47	13	9.2	7.8
28.....	7	7.2	8.9	49	12	8.8	7.6
29.....	7	7.2	8.9	46	12	8.5	7.6
30.....	7	7.6	25	41	12	8.1	7.6
31.....	7		59		12	7.7	

Monthly discharge, in second-feet, of Willow Creek near Crowheart, Wyo., 1931-33

Month	1931-32				1932-33			
	Maximum	Minimum	Mean	Run-off in acre-feet	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	8	7	7.43	457	8.6	7	7.83	481
April 16-30.....	8	6.7	7.39	220				
May.....	153	7.6	52.8	3,250	59	7.4	10.3	633
June.....	138	53	90.8	5,400	239	41	132	7,860
July.....	66	14	25.7	1,580	36	12	20.0	1,230
August.....	15	8.6	10.2	627	11	6.6	8.44	519
September.....	9.5	7.3	8.46	503	7.8	6.2	7.27	433

NOTE.—Monthly discharge in the above table for year 1931-32 supersedes the record published in Water-Supply Paper 731 because of revision of high-water records in May and June (see table on preceding page).

BULL LAKE CREEK NEAR LENORE, WYO.

LOCATION.—Water-stage recorder near north line of sec. 17, T. 3 N., R. 2 W., 14 miles southeast of Lenore and a quarter of a mile above mouth.

DRAINAGE AREA.—222 square miles.

RECORDS AVAILABLE.—1909 (discharge measurements only); May 1918 to September 1933.

DISCHARGE.—Maximum during year, 3,270 second-feet June 14 (gage height, 6.98 feet); minimum, not determined, occurred during winter.

1918-33: Maximum, 3,990 second-feet June 16, 1918 (gage height, 4.3 feet, old datum); minimum not determined.

REMARKS.—Records fair except those for period of ice effect, Dec. 6 to Apr. 16, which were based on scattered gage heights and temperature records. Two small ditches divert above station. Natural storage at Bull Lake. Gage-height record furnished by United States Bureau of Reclamation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	46	26	7.4	12	118	895	1,170	627	202
2	76	44	26			118	1,220	940	634	198
3	67	27	25			124	1,480	818	614	184
4	61	40	24			128	1,530	770	590	184
5	61	37	23			128	1,460	794	566	184
6	64	40	18	7.8	14	128	1,430	810	518	220
7	58	35				118	1,410	850	475	314
8	56	33				106	1,370	940	455	362
9	56	32				97	1,280	1,150	440	386
10	58	32				112	1,540	1,200	435	376
11	56	31	14	7.8	14	131	2,210	1,160	435	342
12	56	31				124	2,480	1,080	435	318
13	56	30				121	2,880	980	430	300
14	58	30				118	2,990	868	430	282
15	53	28				118	2,930	826	430	286
16	53	28	16	10	14	121	2,690	786	430	264
17	61	28		12	14	131	2,470	738	440	269
18	88	28		12	14	140	2,430	714	440	278
19	85	28		14	16	150	2,370	706	425	232
20	79	27		14	26	157	2,210	676	400	228
21	73	26	18	14	32	170	2,030	669	386	209
22	73	27			33	206	1,800	620	366	202
23	67	27			34	252	1,660	596	347	177
24	64	27			35	256	1,530	578	309	167
25	64	26			40	286	1,440	572	278	157
26	58	26	16	14	46	357	1,360	560	282	150
27	53	25		14	56	435	1,270	572	282	144
28	53	26		70	490	1,210	584	260	137	
29	49	26		85	512	1,370	590	240	134	
30	49	26		115	566	1,400	596	232	115	
31	49					698		608	216	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	88	49	62.4	3,840
November	46	25	30.6	1,820
December	26		17.7	1,090
January			a 15	922
February			a 12	666
March			10.6	652
April	115		27.7	1,650
May	698	97	217	13,300
June	2,990	895	1,810	106,000
July	1,200	560	79	48,600
August	634	216	414	25,500
September	386	115	233	13,900
The year	2,990		30 ^a	220,000

• Estimated.

LITTLE WIND RIVER NEAR FORT WASHAKIE, WYO.

LOCATION.—Water-stage recorder in SE¼ sec. 1, T. 1 S., R. 2 W., above Ray Ditch and 6 miles above mouth of North Fork, at Fort Washakie.

DRAINAGE AREA.—118 square miles.

RECORDS AVAILABLE.—May 1921 to September 1933.

DISCHARGE.—Maximum during year, 2,080 second-feet June 14 (gage height, 5.58 feet); minimum, not determined, occurred during winter.

1921-33: Maximum, 5,220 second-feet July 9, 1926 (gage height, 7.59 feet); minimum not determined.

REMARKS.—Records good except those for the periods Oct. 9-14, 21, Nov. 9-10, Apr. 1-2, 23-28, July 9-10, which are estimated. No records Nov. 19 to Mar. 31. Stage-discharge relation affected by ice Nov. 9-10, 12. Water diverted for irrigation above station. Gage-height record furnished by the United States Indian Service.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1.....	24	24	20	85	590	288	97	57
2.....	24	26	20	93	798	254	96	52
3.....	24	24	20	79	765	254	94	46
4.....	24	19	20	96	765	270	87	43
5.....	24	24	18	86	645	254	81	41
6.....	24	26	17	80	705	238	75	44
7.....	24	22	18	63	675	270	68	50
8.....	25	21	17	62	705	345	63	51
9.....	25	21	16	51	735	300	61	56
10.....	25	20	16	56	1,310	280	60	56
11.....	25	20	17	54	1,520	227	58	52
12.....	26	23	18	52	1,590	216	55	51
13.....	26	26	18	55	1,800	196	50	52
14.....	26	24	18	58	1,520	187	48	50
15.....	26	19	20	76	1,310	178	46	69
16.....	26	22	21	96	1,170	178	45	100
17.....	27	23	24	107	1,030	170	45	89
18.....	31	22	26	122	1,030	170	45	80
19.....	29	-----	34	107	960	162	47	74
20.....	29	-----	31	122	830	154	50	69
21.....	32	-----	27	154	675	138	45	62
22.....	34	-----	26	170	618	130	43	58
23.....	34	-----	30	162	535	122	42	55
24.....	26	-----	40	170	535	114	40	49
25.....	26	-----	34	187	485	107	40	52
26.....	31	-----	36	227	435	107	52	57
27.....	30	-----	40	270	390	107	62	54
28.....	28	-----	90	254	460	100	72	50
29.....	24	-----	100	270	510	99	84	48
30.....	23	-----	90	345	390	100	79	46
31.....	24	-----	-----	460	-----	97	62	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	34	23	26.6	1,640
November 1-18.....	26	19	22.6	807
April.....	100	16	30.7	1,330
May.....	460	51	138	3,480
June.....	1,800	390	850	50,600
July.....	345	97	187	11,500
August.....	97	40	61.0	3,750
September.....	100	41	57.1	3,400

NORTH FORK OF LITTLE WIND RIVER AT FORT WASHAKIE, WYO.

LOCATION.—Water-stage recorder in SW¼ sec. 33, T. 1 N., R. 1 W., at Fort Washakie, a quarter of a mile above mouth.

DRAINAGE AREA.—127 square miles.

RECORDS AVAILABLE.—May 1921 to September 1933.

DISCHARGE.—Maximum during year, 1,190 second-feet June 14 (gage height, 3.78 feet); minimum, not determined, occurred during winter.

1921-33: Maximum, 2,640 second-feet July 9, 1926 (gage height, 4.85 feet); minimum, 16 second-feet Jan. 9, 1922, from current-meter measurement.

REMARKS.—Records good except those for estimated periods, Oct. 10-14, 23-25, Nov. 11-18, Apr. 1-2, June 5-9, July 6-7, Sept. 22-23. No records Nov. 20 to Mar. 31. Stage-discharge relation affected by ice, Nov. 11, 12. Water diverted for irrigation above station. Gage-height record furnished by United States Indian Service.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1.....	24	23	23	72	494	318	66	33
2.....	24	22	23	77	646	282	66	31
3.....	24	21	23	65	718	253	65	28
4.....	25	20	23	72	746	236	63	28
5.....	25	22	23	66	736	227	58	28
6.....	25	24	23	63	800	210	56	28
7.....	25	20	23	53	775	245	53	28
8.....	26	22	23	53	800	278	48	29
9.....	26	24	23	45	825	286	45	30
10.....	26	22	23	52	1,000	286	42	30
11.....	26	18	23	56	1,080	264	40	29
12.....	25	22	24	62	1,080	240	38	32
13.....	25	25	24	72	1,160	211	36	32
14.....	25	22	24	89	1,100	194	34	32
15.....	25	20	24	84	975	167	33	41
16.....	25	22	25	95	865	160	33	51
17.....	26	22	29	96	825	151	32	50
18.....	28	22	26	110	780	140	31	48
19.....	28	22	34	104	732	132	31	50
20.....	26	-----	28	114	656	122	33	50
21.....	28	-----	29	138	579	110	29	50
22.....	27	-----	30	149	415	100	28	48
23.....	27	-----	41	140	486	93	28	46
24.....	25	-----	62	149	452	87	28	42
25.....	25	-----	48	169	415	80	30	45
26.....	25	-----	53	211	386	74	40	48
27.....	26	-----	56	233	350	71	42	48
28.....	26	-----	86	206	334	71	42	47
29.....	23	-----	104	224	354	69	41	45
30.....	23	-----	87	290	336	68	37	42
31.....	22	-----	-----	390	-----	65	34	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	28	22	25.4	1,560
November 1-19.....	25	18	21.8	822
April.....	104	23	36.2	2,150
May.....	390	45	123	7,560
June.....	1,160	334	667	41,500
July.....	318	65	171	10,500
August.....	66	28	41.4	2,550
September.....	51	28	39.0	2,320

OWL CREEK NEAR LUCERNE, WYO.

LOCATION.—Chain gage in sec. 7, T. 43 N., R. 94 W., 2 miles south of Lucerne.

DRAINAGE AREA.—505 square miles.

RECORDS AVAILABLE.—February 1932 to February 1933 (discontinued).

DISCHARGE.—Maximum during year, 16 second-feet Nov. 27 (gage height, 1.18 feet); minimum, 0.2 second-foot Oct. 1, 21 (gage height, 0.50 foot).

1932-33: Maximum, 176 second-feet Feb. 26, 1932 (gage height, 3.14 feet); no flow Sept. 23, 1932.

REMARKS.—Records good except those for the period Dec. 1 to Feb. 28, which are based on two discharge measurements and temperature records. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Day	Oct.	Nov.	Jan.	Feb.
1-----	0.3	9.4	-----	-----	16-----	0.7	8.8	-----	-----
2-----	.4	7.3	-----	-----	17-----	.5	12	-----	-----
3-----	.5	12	-----	-----	18-----	.6	9.7	-----	-----
4-----	.4	9.7	-----	-----	19-----	.6	6.1	-----	-----
5-----	.4	11	-----	-----	20-----	.9	6.7	-----	-----
6-----	.3	10	-----	-----	21-----	.2	7.3	-----	-----
7-----	.3	8.5	*5.7	-----	22-----	1.7	11	-----	-----
8-----	.5	7.9	-----	-----	23-----	4.0	12	-----	-----
9-----	1.0	9.4	-----	-----	24-----	8.2	9.7	-----	-----
10-----	1.3	8.8	-----	-----	25-----	3.8	14	-----	-----
11-----	1.2	11	-----	-----	26-----	2.0	13	-----	-----
12-----	.7	8.8	-----	-----	27-----	3.4	16	-----	-----
13-----	.5	9.1	-----	-----	28-----	2.6	14	-----	-----
14-----	.4	11	-----	-----	29-----	5.8	14	-----	-----
15-----	.6	8.2	-----	*5.8	30-----	3.8	9.4	-----	-----
					31-----	6.1		-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	8.2	0.2	1.73	106
November-----	16	6.1	10.2	607
December-----			5	307
January-----			5	307
February-----			6	333
The period-----				1,660

* Result of discharge measurement.

† Estimated.

GREYBULL RIVER AT MEETEETSE, WYO.

LOCATION.—Water-stage recorder in sec. 4, T. 48 N., R. 100 W., at Meeteetse. Zero of gage is 5,718.63 feet above mean sea level.

DRAINAGE AREA.—690 square miles.

RECORDS AVAILABLE.—June to September 1897; April to October 1913; July 1920 to September 1933.

DISCHARGE.—Maximum during year, 4,550 second-feet June 15 (gage height, 6.42 feet); minimum, not determined, occurred during winter.

1897, 1903, 1920-33: Maximum, 7,320 second-feet Aug. 14, 1930 (gage height, 8.2 feet); minimum, 11 second-feet Mar. 26, 1931 (gage height, 3.42 feet).

REMARKS.—Records fair. Discharge estimated Nov. 9-27, Dec. 4 to Apr. 15, on basis of two discharge measurements and temperature records, and Sept. 1-30 on intermittent gage readings. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1	100	130	108				492	2,500	838	190	195
2	100	130	112				420	2,480	795	256	190
3	100	122	98			110	450	2,420	810	245	185
4	106	104	89				484	2,240	797	175	180
5	104	118	80				361	1,910	745	222	175
6	95	132					368	1,690	868	206	170
7	97	118					293	1,480	779	190	165
8	106	112	65	* 62		100	268	1,500	779	175	160
9	122	100					249	2,000	795	175	160
10	118	95					188	2,440	584	175	175
11	127						226	2,930	544	175	170
12	125						216	2,730	544	175	160
13	122	75	55			120	194	2,930	431	190	165
14	116						184	2,550	431	175	170
15	102						255	3,590	467	160	175
16	104				* 28	144	305	3,100	497	160	175
17	125					226	312	3,370	453	175	175
18	134	85	60			243	368	3,120	397	175	168
19	137					204	398	2,860	327	175	160
20	127					132	484	2,530	327	175	185
21	134					132	796	2,350	327	160	175
22	153					130	1,010	2,030	307	160	162
23	148	80	65			127	809	1,900	297	160	150
24	125					90	850	1,610	282	155	155
25	122					132	980	1,490	262	155	155
26	139	85				226	1,200	1,430	245	562	152
27	134	90				305	1,100	1,230	237	256	150
28	137	94	60			382	995	1,390	207	390	150
29	122	92				467	1,040	1,150	197	256	150
30	130	100				659	2,020	972	211	228	150
31	120						2,460		197	200	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	153	95	120	7,380
November	132		94.1	5,600
December	112		66.8	4,110
January			60	3,690
February			40	2,220
March			75	4,610
April	659	90	175	10,400
May	2,490	184	638	39,200
June	3,590	972	2,200	131,000
July	868	190	481	29,600
August	562	155	207	12,700
September	195	150	167	9,940
The year	3,590		359	260,000

* Result of discharge measurement.

† Estimated.

GREYBULL RIVER NEAR BASIN, WYO.

LOCATION.—Chain gage in sec. 17, T. 51 N., R. 94 W., 8 miles west of Basin.

DRAINAGE AREA.—1,130 square miles.

RECORDS AVAILABLE.—April 1930 to September 1933.

DISCHARGE.—Maximum during year, 2,580 second-feet June 10 (gage height, 5.4 feet); minimum, 0.7 second-foot Aug. 8-10, Sept. 8, 18-22 (gage height, 0.62 foot).

1930-33: Maximum, 3,120 second-feet June 8, 1931 (gage height, 6.4 feet); no flow several days during July 1931 and July 23, 1932.

REMARKS.—Records good except those estimated for periods Nov. 5-14, Apr. 22-25, June 4-7. No records Dec. 8 to Mar. 31. Numerous diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1.....	1	141	90	124	1,530	1,750	44	4.8	5.6
2.....	1	143	94	132	778	2,270	23	15	3.1
3.....	9	143	87	141	536	2,440	18	23	2.6
4.....	1	158	90	146	522	2,500	15	8.6	1.5
5.....	1	150	94	153	599	2,300	9	6.0	1.2
6.....	1		90	160	392	1,800	5	3.7	1
7.....	9		84	172	392	1,400	20	3.1	.8
8.....	1.2	130		143	217	1,020	6	.7	.7
9.....	1			120	163	1,840	20	.7	1.2
10.....	132			106	178	2,540	7.8	1.7	3.6
11.....	190			97	230	2,430	6.8	11	6.2
12.....	257	110		111	302	2,290	16	6.8	3.6
13.....	62			136	158	2,210	4.7	5.0	1.7
14.....	30			138	175	1,700	4.2	5.8	1.4
15.....	28	126		146	235	1,570	12	5.8	.9
16.....	35	118		153	175	1,380	38	4.5	.9
17.....	41	118		148	222	1,720	9.8	5.2	.8
18.....	41	132		155	204	2,020	10	5.8	.7
19.....	28	141		290	246	1,430	6.2	7	.7
20.....	136	150		494	302	1,150	4.5	19	.7
21.....	134	153		338	338	1,000	9.4	12	.7
22.....	113	136		340	398	770	6	10	.7
23.....	124	134		350	487	550	5.2	11	.8
24.....	108	122		370	515	431	5.8	12	1.2
25.....	100	116		500	557	392	12	13	1.9
26.....	92	111		978	613	240	4.7	627	3.1
27.....	90	100		1,040	676	217	5	141	2.3
28.....	108	95		1,200	754	172	7	116	1.5
29.....	130	86		1,440	938	143	7.4	55	.9
30.....	146	86		1,310	1,190	77	13	22	.8
31.....	132				1,520		5	12	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	257	0.9	73.1	4,490
November.....	158	86	125	7,440
December 1-7.....	94	84	89.9	1,250
April.....	1,440	97	371	22,100
May.....	1,530	158	501	30,800
June.....	2,540	77	1,390	82,700
July.....	44	4.2	11.6	713
August.....	627	.7	37.9	2,330
September.....	6.2	.7	1.76	105

WOOD RIVER NEAR MEETEETSE, WYO.

LOCATION.—Chain gage in sec. 27, T. 48 N., R. 101 W., 7 miles southwest of Meeteetse and 1,200 feet above mouth.

DRAINAGE AREA.—218 square miles.

RECORDS AVAILABLE.—September 1910 to October 1912; May 1915 to September 1917; April 1930 to September 1933.

DISCHARGE.—Maximum during year, 852 second-feet June 6 (gage height, 3.26 feet); minimum, 28 second-feet Mar. 24 (gage height, 1.28 feet).

1910–12, 1915–17, 1930–33: Maximum (estimated), 1,700 second-feet June 8, 1912; minimum, 27 second-feet Mar. 26, 29, 1931.

REMARKS.—Records fair. Discharge estimated for periods Mar. 1–7, Apr. 1–15. No record Oct. 1 to Feb. 28. Diversions for irrigation above station.

Discharge, in second-feet, 1932–33

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	40	212	712	126	82	100
2			212	780	106	81	93
3			218	816	120	91	78
4			224	798	106	81	81
5			206	766	112	78	88
6	50	35	188	838	124	78	93
7	55		165	789	112	79	88
8	65		157	712	124	79	74
9	50		157	686	118	67	86
10	44		129	699	129	64	74
11	50	40	129	726	129	62	78
12	64		124	780	120	64	67
13	64		129	807	122	64	84
14	35		157	789	108	64	82
15	38		179	722	112	67	73
16	50	55	209	382	118	73	61
17	47	67	218	376	129	68	65
18	40	65	218	200	131	68	61
19	40	67	251	167	122	78	58
20	38	49	260	284	118	78	62
21	35	37	309	95	118	73	64
22	32	52	348	131	116	82	61
23	30	76	309	133	112	81	60
24	30	81	302	120	91	62	61
25	32	126	320	108	88	65	60
26	54	126	412	154	82	173	58
27	42	179	412	173	82	152	55
28	54	188	400	215	79	116	57
29	46	206	379	212	78	131	57
30	48	221	548	140	81	104	60
31	47		658		79	120	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	65	30	46.1	2,830
April	221		72.3	4,300
May	658	124	263	16,200
June	838	95	477	28,400
July	131	78	199	6,700
August	173	62	84.7	5,210
September	100	55	71.3	4,240
The period				67,900

BENCH CANAL NEAR BURLINGTON, WYO.

LOCATION.—Staff gage in sec. 8, T. 51 N., R. 97 W., 200 yards below head gate and 7 miles southwest of Burlington.

RECORDS AVAILABLE.—April 1930 to September 1933.

DISCHARGE.—Maximum during year, 203 second-feet June 28 to July 5 (gage height, 1.5 feet); no flow during winter.

1930-33: Maximum, 203 second-feet July 8, 1932 (gage height, 1.66 feet), and June 28 to July 5, 1933 (gage height, 1.5 feet); no flow at times.

REMARKS.—Records fair. Discharge estimated Sept. 12-30. No record Oct. 1 to Apr. 25. Complete regulation at head gate. Gage-height record furnished by Bench Canal Co. Canal diverts water from Greybull River for irrigation of 10,000 to 15,000 acres around Burlington.

Discharge, in second-feet, 1932-33

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		24	182	203	18	128	16		67	190	33	11	25
2		34	165	203	25	128	17		79	191	98	11	25
3		34	165	203	25	113	18		92	178	98	11	25
4		34	165	203	33	113	19		105	178	98	11	25
5		34	165	203	25	84	20		105	179	33	11	25
6		34	165	158	25	84	21		119	179	33	18	25
7		34	165	158	25	84	22		119	180	33	18	25
8		34	165	158	25	70	23		119	180	33	18	25
9		34	165	173	11	33	24		134	182	33	18	25
10		34	182	158	18	33	25		134	182	33	18	30
11		34	166	158	18	33	26	15	149	185	33	25	35
12		44	184	158	18	33	27	24	149	202	33	98	40
13		44	170	158	18	33	28	24	149	203	33	113	30
14		55	186	128	18	30	29	24	149	203	25	128	25
15		55	188	33	11	30	30	34	165	203	25	128	25
							31		182		25	128	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 26-30	34	15	24.2	240
May	182	24	83.2	5,120
June	203	165	180	10,700
July	203	25	102	6,270
August	128	11	34.8	2,140
September	128	25	48.0	2,860
The period				27,300

SHOSHONE RIVER BELOW SHOSHONE RESERVOIR, WYO.

LOCATION.—Water-stage recorder in lot 76, T. 52 N., R. 102 W., about $4\frac{1}{2}$ miles west of Cody.

DRAINAGE AREA.—1,470 square miles.

RECORDS AVAILABLE.—January 1921 to September 1933.

DISCHARGE.—Maximum during year, 10,600 second-feet June 18 (gage height, 8.50 feet); minimum, 14 second-feet Mar. 29, Apr. 1 (gage height, —0.5 foot).

REMARKS.—No diversions between station and Shoshone Dam. Flow completely regulated by storage in Shoshone Reservoir; capacity, 456,000 acre-feet. Complete records furnished by United States Bureau of Reclamation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	273	243	280	216	200	190	77	1,080	1,420	4,330	1,610	779
2.....	269	194	276	216	216	190	164	1,090	1,430	3,920	1,630	785
3.....	265	240	280	236	219	190	178	1,080	1,440	3,790	1,650	779
4.....	262	209	149	223	197	190	197	1,080	1,440	3,690	2,310	772
5.....	262	296	216	219	194	190	194	1,080	1,490	3,600	4,120	785
6.....	262	273	269	209	197	190	178	1,080	1,590	3,470	3,980	785
7.....	250	265	296	212	203	190	161	1,070	1,700	3,430	3,870	838
8.....	247	250	401	200	209	190	155	1,090	1,670	3,260	3,770	900
9.....	236	247	396	203	209	190	197	1,080	1,800	3,140	3,550	893
10.....	240	319	392	197	209	190	240	1,080	2,120	3,030	3,440	879
11.....	250	332	411	203	209	190	240	906	2,460	2,530	3,350	886
12.....	247	340	379	197	209	190	240	673	1,900	2,750	2,710	893
13.....	265	336	387	194	209	190	236	673	2,140	2,560	2,480	893
14.....	206	348	319	197	200	190	226	673	4,700	2,390	3,380	900
15.....	269	361	348	194	190	190	233	679	7,660	2,240	3,330	893
16.....	258	284	323	194	190	190	223	679	9,150	2,100	3,310	879
17.....	206	332	311	194	190	190	307	667	10,200	2,030	3,300	865
18.....	269	280	276	194	190	190	319	667	10,300	1,990	3,290	886
19.....	240	332	288	194	190	190	416	818	9,970	1,540	3,260	886
20.....	194	348	288	200	190	190	420	1,390	9,150	2,010	3,260	893
21.....	209	357	269	190	190	190	406	1,380	8,230	2,110	3,260	893
22.....	280	280	265	187	190	190	474	1,400	7,590	2,060	3,260	893
23.....	323	396	262	200	190	184	685	1,400	7,220	1,960	3,260	886
24.....	233	332	258	200	190	178	685	1,400	6,850	1,900	3,250	872
25.....	258	296	236	197	190	172	691	1,400	6,500	1,840	3,240	872
26.....	233	344	216	197	190	169	691	1,400	6,150	1,730	3,210	858
27.....	327	288	226	203	190	166	710	1,400	5,820	1,630	3,210	852
28.....	240	284	229	203	190	172	1,100	1,390	5,410	1,620	2,340	852
29.....	250	284	236	203	-----	77	1,110	1,400	5,010	1,610	1,010	852
30.....	219	280	229	203	-----	141	1,080	1,400	4,700	1,600	872	614
31.....	327	-----	229	203	-----	133	-----	1,420	-----	1,580	818	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	327	194	254	15,600
November.....	396	194	299	17,800
December.....	411	149	288	17,700
January.....	236	187	203	12,500
February.....	219	190	198	11,000
March.....	190	77	180	11,100
April.....	1,110	77	408	24,300
May.....	1,420	667	1,100	67,600
June.....	10,300	1,420	4,910	292,000
July.....	4,330	1,580	2,520	155,000
August.....	4,120	818	2,880	177,000
September.....	900	614	850	50,600
The year.....	10,300	77	1,180	852,000

SHOSHONE RIVER AT BYRON, WYO.

LOCATION.—Water-stage recorder in sec. 34, T. 56 N., R. 97 W., at Byron.

DRAINAGE AREA.—2,300 square miles.

RECORDS AVAILABLE.—January 1929 to September 1933.

DISCHARGE.—Maximum during year, 8,060 second-feet June 20 (gage height, 4.91 feet); minimum, 80 second-feet Apr. 18 (gage height, 0.74 foot).

1929-33: Maximum, about 13,900 second-feet June 25, 1932 (gage height, 6.45 feet); minimum, 29 second-feet Feb. 14, 1932, from discharge measurement.

REMARKS.—Records good except those for the periods of ice effect, Nov. 6-18, Dec. 9 to Mar. 15, which are estimated on the basis of two discharge measurements and temperature records, and those estimated, Mar. 23-29, May 3-6, July 23-24. Water diverted for irrigation above station. Flow regulated by Shoshone Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	326	418	386	-----	-----	260	272	1,000	646	3,170	558	565
2.....	294	396	375	-----	-----		288	353	678	2,840	584	500
3.....	267	348	375	-----	-----		326	300	602	2,620	651	475
4.....	272	386	380	-----	-----		310	260	630	2,470	693	420
5.....	283	408	277	-----	-----		251	220	638	2,260	2,320	408
6.....	283	418	326	-----	-----	270	262	180	638	2,170	2,700	361
7.....	277	430	177	-----	-----		246	152	686	2,070	2,490	320
8.....	321	425	196	-----	-----		215	191	746	1,970	2,320	349
9.....	358	420	200	° 371	-----		136	241	616	1,880	2,170	396
10.....	353	425	200	-----	-----		136	315	670	1,740	2,020	426
11.....	375	400	220	-----	-----	270	256	299	940	1,540	1,900	378
12.....	358			-----	-----		283	256	1,290	1,360	1,840	372
13.....	364			-----	-----		299	246	782	1,160	1,763	366
14.....	353			-----	-----		326	256	2,730	968	1,800	372
15.....	337			-----	-----		348	299	5,580	932	1,860	372
16.....	331	410	270	-----	-----	250	262	272	6,940	779	1,900	378
17.....	337			-----	° 248	277	267	230	7,800	763	1,930	408
18.....	337			-----	-----	267	201	225	7,980	721	2,050	402
19.....	369			-----	-----	256	108	210	7,770	672	2,020	390
20.....	358			-----	-----	272	236	402	7,910	644	2,120	432
21.....	348	459	350	-----	-----	267	283	595	7,590	742	2,290	469
22.....	358	465		-----	-----	241	310	970	7,020	735	2,340	463
23.....	348	430		-----	-----	230	262	950	6,280	710	2,290	444
24.....	342	459		-----	-----	240	230	638	5,820	680	2,260	457
25.....	337	453		-----	-----	240	152	616	5,360	651	2,320	513
26.....	326	430	320	-----	-----	250	130	638	4,680	624	3,340	546
27.....	310	430		-----	-----	250	122	678	4,120	552	2,940	520
28.....	283	430		-----	-----	260	122	702	4,060	520	2,650	469
29.....	304	424		-----	-----	260	294	686	3,840	532	920	450
30.....	321	408		-----	-----	272	396	638	3,510	565	644	432
31.....	304	-----	-----	-----	-----	262	-----	574	-----	558	637	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	375	267	327	20,100
November.....	465	348	419	24,900
December.....	386	177	291	17,800
January.....	-----	-----	° 350	21,500
February.....	-----	-----	° 280	15,600
March.....	277	230	259	15,900
April.....	396	108	244	14,500
May.....	1,000	152	438	26,900
June.....	7,980	602	3,620	215,000
July.....	3,170	520	1,280	78,700
August.....	3,340	558	1,850	114,000
September.....	565	320	428	25,500
The year.....	7,980	108	816	590,000

° Result of discharge measurement.

° Estimated.

LITTLE HORN RIVER NEAR CROW AGENCY, MONT.

LOCATION.—Chain gage in NE¼ sec. 13, T. 3 S., R. 34 E., at Chicago, Burlington & Quincy Railroad bridge 2 miles south of Crow Agency and 14 miles above mouth.

DRAINAGE AREA.—1,190 square miles.

RECORDS AVAILABLE.—September 1911 to September 1924 and August 1928 to December 1932 (discontinued). March 1905 to June 1906 at Crow Agency, about 2 miles downstream. Crow Agency ditch diverts water between two locations.

DISCHARGE.—1905-6; 1911-24, 1928-32: Maximum, 8,200 second-feet July 23, 1923 (gage height, 14.0 feet); no flow July 28 to Aug. 6, 1921.

REMARKS.—Records fair. Several diversions above station. Some regulation by head-gate operations above station.

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1.....	110	166	148	11.....	144	164	-----	21.....	150	172	-----
2.....	110	153	148	12.....	144	164	-----	22.....	150	166	-----
3.....	117	159	148	13.....	148	164	-----	23.....	155	157	-----
4.....	124	155	148	14.....	144	159	-----	24.....	207	129	-----
5.....	127	155	115	15.....	146	164	-----	25.....	164	155	-----
6.....	133	150	-----	16.....	138	207	-----	26.....	194	174	-----
7.....	136	150	-----	17.....	142	242	-----	27.....	201	164	-----
8.....	136	150	-----	18.....	146	214	-----	28.....	207	155	-----
9.....	144	155	-----	19.....	146	172	-----	29.....	201	155	-----
10.....	148	164	-----	20.....	146	183	-----	30.....	194	150	-----
								31.....	172	-----	-----
Month											
				Maximum		Minimum		Mean		Run-off in acre-feet	
October.....				207		110		153		9,410	
November.....				242		129		166		9,880	
December 1-5.....				148		115		141		1,400	

TONGUE RIVER NEAR DECKER, MONT.

LOCATION.—Chain gage in sec. 23, T. 9 S., R. 40 E., $1\frac{1}{2}$ miles east of Decker and 2 miles north of Wyoming State line.

DRAINAGE AREA.—1,610 square miles.

RECORDS AVAILABLE.—April 1928 to September 1933.

DISCHARGE.—Maximum during year, 5,180 second-feet June 3 (gage height, 6.55 feet); minimum, 37 second-feet Aug. 1 (gage height, 0.40 foot).

1928-33: Maximum, 7,220 second-feet June 2, 1929 (gage height, 8.25 feet); minimum, 8 second-feet July 29, 1931 (gage height, 0.02 feet).

REMARKS.—Records good except those for periods of ice effect, Nov. 7-20, Dec. 1 to Mar. 20, which are estimated on the basis of two discharge measurements and temperature records. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	175	273	-----	-----	180	363	1,130	4,330	458	38	163
2.....	183	260	-----	-----		355	1,070	4,790	404	46	160
3.....	183	254	-----	-----		344	966	5,140	375	43	153
4.....	188	239	-----	-----		348	1,020	4,980	355	60	144
5.....	188	227	-----	-----		324	1,670	4,950	324	48	135
6.....	193	221	-----	-----	225	330	1,590	4,940	300	48	126
7.....	188	215	-----	-----		310	1,870	4,810	296	49	115
8.....	199	210	-----	-----		300	1,510	4,600	293	55	98
9.....	204	200	-----	-----		283	1,780	4,430	280	53	86
10.....	210	190	-----	-----		280	1,620	4,230	257	57	104
11.....	216	180	° 157	-----	280	267	1,700	3,980	221	58	100
12.....	218	160	-----	-----		254	1,550	3,450	202	57	102
13.....	216	170	-----	-----		276	1,340	3,110	180	57	102
14.....	210	190	-----	-----		306	1,180	2,880	170	53	104
15.....	210	200	-----	-----		344	1,130	2,550	163	51	104
16.....	207	210	-----	-----	300	404	1,190	2,330	148	44	113
17.....	221	230	-----	-----		515	1,330	2,150	153	38	104
18.....	236	248	-----	-----		629	1,400	1,860	144	40	111
19.....	254	248	-----	° 125		1,070	1,830	1,710	137	43	117
20.....	196	248	-----	-----		602	2,090	1,540	122	41	104
21.....	180	242	-----	-----	293	505	2,440	1,430	100	46	102
22.....	218	239	-----	-----	359	779	2,580	1,210	98	64	111
23.....	230	230	-----	-----	495	1,290	3,110	1,130	98	80	122
24.....	239	224	-----	-----	395	1,640	3,520	1,070	76	92	156
25.....	257	221	-----	-----	440	1,450	3,300	958	72	90	163
26.....	273	218	-----	-----	375	950	3,380	793	68	94	180
27.....	296	216	-----	-----	338	1,050	3,500	688	64	117	199
28.....	317	210	-----	-----	327	1,130	3,160	607	60	153	186
29.....	300	207	-----	-----	310	1,340	2,990	545	53	199	193
30.....	286	204	-----	-----	306	1,250	3,290	476	44	213	151
31.....	276	-----	-----	-----	363	-----	3,710	-----	43	202	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	317	175	225	13,800
November.....	273	160	219	13,000
December.....	-----	-----	^b 165	10,100
January.....	-----	-----	^b 160	9,840
February.....	-----	-----	^b 130	7,220
March.....	495	-----	288	17,700
April.....	1,640	254	643	38,300
May.....	3,710	966	2,060	127,000
June.....	5,140	476	2,720	162,000
July.....	458	43	186	11,400
August.....	213	38	75.1	4,620
September.....	199	86	130	7,740
The year.....	5,140	38	584	423,000

° Result of discharge measurement.

^b Estimated.

TONGUE RIVER NEAR MILES CITY, MONT.

LOCATION.—Staff gage in NW¼SW¼ sec. 29, T. 6 N., R. 48 E., on right abutment of Tongue and Yellowstone River irrigation district dam 12 miles south of Miles City.

RECORDS AVAILABLE.—May 1929 to October 1932 (discontinued).

DISCHARGE.—1929-32: Maximum, 5,910 second-feet June 5, 1929 (gage height, 4.4 feet); no flow at times.

REMARKS.—Records fair. Numerous diversions.

Discharge, in second-feet, 1932

Day	Oct.	Day	Oct.	Day	Oct.
1.....	0	11.....	18	21.....	438
2.....	0	12.....	12	22.....	414
3.....	0	13.....	12	23.....	438
4.....	0	14.....	12	24.....	486
5.....	0	15.....	190	25.....	462
6.....	0	16.....	190	26.....	414
7.....	0	17.....	226	27.....	368
8.....	0	18.....	438	28.....	324
9.....	12	19.....	438	29.....	302
10.....	18	20.....	510	30.....	280
				31.....	262

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	510	0	202	12, 400

GOOSE CREEK NEAR SHERIDAN, WYO.

LOCATION.—Water-stage recorder in sec. 35, T. 55 N., R. 86 W., 14 miles southwest of Sheridan and half a mile above Cave Creek.

DRAINAGE AREA.—110 miles.

RECORDS AVAILABLE.—September 1929 to September 1933.

DISCHARGE.—Maximum during year, 1,560 second-feet June 3 (gage height, 4.55 feet); minimum, not determined, probably occurred during winter.

1929–33: Maximum, 1,640 second-feet May 22, 1932 (gage height, 4.64 feet); minimum not determined.

REMARKS.—Records good except those estimated for periods of ice effect, Nov. 12–13, Dec. 11 to Mar. 25, which were estimated on the basis of two discharge measurements and temperature records, and those estimated July 24, Sept. 25–30. Water diverted above station from East Fork of Goose Creek into Little Goose Creek. Flow partly regulated by storage in Dome Lake.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1.....	14	28	16			18	114	1,250	122	36	28
2.....	13	26	16				116	1,380	94	37	27
3.....	13	24	16				116	1,460	82	33	25
4.....	13	16	15				137	1,470	72	29	27
5.....	13	23	14				188	1,430	79	30	34
6.....	13	21	8			16	200	1,340	83	32	32
7.....	13	19	12				190	1,260	77	32	32
8.....	14	18	11				202	1,080	74	31	30
9.....	14	24	9				177	910	65	36	32
10.....	13	20	11				135	1,030	58	36	30
11.....	14	16	9	^a 13		18	109	1,270	53	30	28
12.....	14	15					100	1,060	49	26	30
13.....	13	16	9				95	918	36	25	30
14.....	13	18					104	815	26	14	28
15.....	32	18					125	745	25	12	26
16.....	49	22	11			20	168	724	27	22	23
17.....	45	21					235	738	30	22	16
18.....	29	22					298	662	29	22	15
19.....	26	22			^a 10		337	579	27	23	15
20.....	25	22					381	470	25	24	14
21.....	33	20	15			25	490	417	26	26	14
22.....	32	20				27	644	329	25	28	14
23.....	31	15				35	698	291	23	25	13
24.....	25	20				51	698	291	25	25	13
25.....	22	18				54	717	209	27	24	13
26.....	30	17	12			70	698	192	28	28	13
27.....	27	18				101	731	175	28	30	12
28.....	25	18				146	686	148	30	67	12
29.....	16	16				143	701	148	41	39	12
30.....	24	16				127	829	141	42	31	12
31.....	18						1,050		38	28	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	49	13	21.8	1,340
November.....	28	15	19.6	1,170
December.....			^b 12.1	744
January.....			^b 12	738
February.....			^b 10	555
March.....			14	861
April.....	146		38.0	2,260
May.....	1,050	95	370	22,800
June.....	1,470	141	764	45,500
July.....	122	23	47.3	2,910
August.....	67	12	29.1	1,790
September.....	34	12	21.7	1,290
The year.....	1,470		113	82,000

^a Result of discharge measurement.

^b Estimated.

POWDER RIVER AT ARVADA, WYO.

LOCATION.—Chain gage in sec. 16, T. 54 N., R. 77 W., at Arvada, a quarter of a mile above Wildhorse Creek. Zero of gage is 3,623.8 feet above mean sea level.

DRAINAGE AREA.—6,050 square miles.

RECORDS AVAILABLE.—May 1919 to September 1933; July 1915 to April 1919 just above mouth of Clear Creek, 16 miles downstream.

DISCHARGE.—Maximum during year, 10,600 second-feet Aug. 29 (gage height, 7.60 feet); no flow Oct. 1–17, July 23 to Aug. 4, Aug. 11–28.

1919–33: Maximum, determined by slope area method, 72,000 second-feet (revised) Sept. 29, 1923 (gage height, 23.7 feet); no flow during part of summers of 1919, 1921–23; 1931–33. Average, 17 years (1916–33), 555 second-feet.

REMARKS.—Records fair except those for period of ice effect, Oct. 19–22, Nov. 9–21, Nov. 30 to Mar. 19, which are estimated on basis of two discharge measurements and temperature records. Diversions from tributaries upstream.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	122				604	1,730	1,860	73	0	912
2	0	180				480	1,320	2,580	67	0	615
3	0	160			a 80	300	1,070	1,950	63	0	260
4	0	152				250	576	1,570	63	0	230
5	0	140				320	972	1,440	48	0	150
6	0	180				340	2,590	1,500	58	69	120
7	0	160				280	2,450	1,260	54	37	106
8	0	150			a 150	260	1,890	1,210	593	22	99
9	0	a 140				430	1,340	1,020	102	13	109
10	0	a 130				320	1,150	972	68	5	1,540
11	0	a 100				260	1,190	828	39	0	1,570
12	0	a 110	b 18			260	2,140	2,530	33	0	510
13	0	a 120			a 300	220	3,810	1,420	30	0	230
14	0	a 130				200	4,000	747	24	0	260
15	0	a 120				260	3,860	659	17	0	637
16	0	a 120				200	3,070	520	13	0	440
17	0	a 120				270	1,580	440	9	0	145
18	10	a 130			a 500	250	1,120	420	4	0	142
19	a 50	a 140				260	1,150	490	12	0	120
20	a 30	a 140		b 1	828	290	1,320	864	13	0	120
21	a 29	a 140			758	270	1,220	1,220	5	0	110
22	a 80	a 142			700	340	1,540	96	3	0	107
23	135	135			790	692	2,980	360	0	0	107
24	118	115			876	900	5,180	1,230	0	0	102
25	135	115			780	2,180	2,750	270	0	0	96
26	135	120			540	2,140	2,180	230	0	0	96
27	145	190			490	1,890	1,860	155	0	0	97
28	107	155			540	1,490	1,950	110	0	0	99
29	120	152			540	1,380	2,020	84	0	8,130	96
30	109	160			604	2,030	1,780	78	0	3,650	106
31	115				637		1,630		0	1,600	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	145	0	42.5	2,610
November	190	100	139	8,270
December			a 65	4,000
January			a 15	922
February			a 10	555
March	876		411	25,300
April	2,180	200	646	38,400
May	5,180	876	2,050	126,000
June	2,580	78	966	57,500
July	593	0	44.9	2,760
August	8,130	0	436	26,800
September	1,570	96	311	18,500
The year	8,130	0	431	312,000

a Estimated.

b Result of discharge measurement.

POWDER RIVER AT MOORHEAD, MONT.

LOCATION.—Water-stage recorder in sec. 18, T. 9 S., R. 48 E., $\pm$ Moorhead.

RECORDS AVAILABLE.—May 1929 to August 1933.

DISCHARGE.—Maximum during year, about 14,800 second-feet Aug. 30 (gage height, 10.85 feet); no flow July 28 to Aug. 2. Maximum stage, 12.38 feet Feb. 28, 1932 (ice).

1929-33: Maximum, that of Aug. 30, 1933; no flow July 16-17, 1931, Aug. 6-11, 1932, July 28 to Aug. 2, 1933.

REMARKS.—Records poor. Stage-discharge relation affected by ice Oct. 18-21, Nov. 1 to Mar. 16. Some diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1.....	30						565	2,360	3 060	136	0
2.....	31						494	2,040	3 500	104	0
3.....	38						434	1,560	3 740	96	.5
4.....	35						418	1,190	3 850	94	41
5.....	30						375	900	3 960	94	53
6.....		156	115	140	14	105					
7.....	26						412	1,000	3 740	72	34
8.....	28						412	2,380	3 500	68	40
9.....	40						306	2,640	3 280	53	36
10.....	39						418	2,500	2 950	194	43
11.....	36						440	2,150	2 520	145	36
12.....											
13.....	36						440	2,090	2 420	102	30
14.....	41						458	2,230	3 390	86	28
15.....	59						464	2,480	4 540	72	
16.....	79						458	2,950	4 200	64	
17.....		95	13	83	11		452	3,390	2 150	58	
18.....							429	3,280	1 480	28	
19.....						1,160	424	2,950	1 290	20	
20.....						991	452	2 460	1 040	16	
21.....						880	526	2 210	817	14	
22.....						790	607	2 230	688	14	26
23.....											
24.....											
25.....											
26.....	133					621	635	2,560	702	13	
27.....	119					579	579	3,060	910	12	
28.....	235					299	702	2,950	880	11	
29.....	239					274	871	7,850	1 470	8.6	
30.....	217					476	970	5,470	710	7.7	
31.....											
26.....	200	240	42	47	42	552	1,240	3,850	407	5.9	
27.....	200					532	2,020	3,620	266	1.5	
28.....	203					464	2,150	3,620	213	0	
29.....	197					500	2,230	3,280	187	0	875
30.....	191					513	2,460	3,060	164	0	8,470
31.....	194					565		2,950		0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	239	26	102	6,270
November.....			164	9,760
December.....			56.2	3,460
January.....			88.6	5,450
February.....			20.9	1,160
March.....	1,160		421	25,900
April.....	2,460	375	764	45,500
May.....	7,850	900	2,810	173,000
June.....	4,540	164	2,070	123,000
July.....	194	0	51.3	3,150
August 1-30.....	8,470	0	337	20,100
The period.....				416,000

POWDER RIVER NEAR MIZPAH, MONT.

LOCATION.—Wire gage near center of sec. 30, T. 6 N., R. 52 E., at highway bridge 2 miles southeast of Mizpah and 36 miles southeast of Miles City.

RECORDS AVAILABLE.—August 1928 to March 1933 (discontinued).

DISCHARGE.—Maximum during year, 1,340 second-feet Mar. 19 (gage height, 3.86 feet); no flow Dec. 8, 9 (ice effect).

1928-33: Maximum, 14,700 second-feet Mar. 12, 1929 (gage height, 8.9 feet); no flow at various times in August, September, and December 1932.

REMARKS.—Records fair. Stage-discharge relation affected by ice Nov. 14 to Mar. 18. Some diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1-----	6.8	* 166	460	175	4.0	150	16-----	38	190	* 24	150	11	275
2-----	6.8	140	* 340				17-----	38		* 31			
3-----	6.8	165	* 220				18-----	33		38			
4-----	9.2	148	102				19-----	28		62			1,340
5-----	19	148	38				20-----	75		75			1,110
6-----	28	182	* 25	150	4.0	150	21-----	138	415	115	* 68	82	980
7-----	38	182	* 12				22-----	200			* 65		662
8-----	62	* 173	0				23-----	262			62		925
9-----	88	* 165	0				24-----	325			38		740
10-----	82	157	* 4				25-----	296			* 35		625
11-----	82	148	8	150	11	275	26-----	247	415	115	33	82	590
12-----	68	140	26				27-----	247			38		740
13-----	56	140	10				28-----	247			38		* 760
14-----	47	31	19				29-----	247			* 29		780
15-----	38	190	* 17				30-----	165			21		740
							31-----	191			24		780

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	325	6.8	110	6,760
November-----		31	246	14,600
December-----	460	0	89.5	5,500
January-----		21	119	7,320
February-----			28.8	1,600
March-----	1,340		467	28,700
The period-----				64,500

* Interpolated.

LITTLE MUDDY RIVER BASIN

LITTLE MUDDY RIVER NEAR WILLISTON, N.DAK.

LOCATION.—Wire gage in sec. 31, T. 155 N., R. 100 W., half a mile upstream from bridge on United States highway 2 and $4\frac{1}{2}$ miles northeast of Williston.

RECORDS AVAILABLE.—June 1932 to July 1933 (discontinued); February 1904 to April 1909 at site just above Camp Creek, 2 miles upstream.

DISCHARGE.—Maximum during year, 798 second-feet Mar. 8–10 (gage height, 11.54 feet, ice); minimum (estimated), 0.1 second-foot Feb. 1–20, 1933.

1904–9, 1932–33: Maximum (estimated), 4,340 second-feet Apr. 11, 1904 (gage height, 10.3 feet, on former gage); minimum, that of Feb. 1–20, 1933.

REMARKS.—Records good except those for period of ice effect, Nov. 8 to Mar. 31, which are fair. Discharge interpolated Mar. 24–29.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1.....	7.2	11.0	5.0		0.1	546	139	23.0	23.0	6.7
2.....	7.2	10.0				534	100	22.0	20.8	5.8
3.....	6.8	10.0				438	90	20.0	17.3	5.8
4.....	6.8	10.0				391	82	19.4	15.9	4.9
5.....	6.4	10.0				259	72	18.0	14.5	4.9
6.....	6.4	10.0	5.0		0.1	227	60	16.6	12.7	4.9
7.....	6.0	10.0				250	29	17.3	9.1	4.0
8.....	6.0					798	31	21.0	8.5	4.0
9.....	5.7					798	43	22.0	8.5	4.0
10.....	5.7					798	56	21.0	8.5	4.9
11.....	5.4		0.2		0.1	702	64	18.7	8.5	4.9
12.....	6.0					702	77	17.3	8.5	4.0
13.....	6.0					546	56	15.9	8.5	4.0
14.....	6.0					510	50	15.9	9.1	4.0
15.....	6.0					450	43	17.3	8.0	3.4
16.....	6.4		8.0	0.2		414	40	16.6	7.6	3.4
17.....	6.4					380	40	17.3	7.6	3.4
18.....	6.4					380	41	17.3	8.0	3.4
19.....	7.2					314	40	17.3	8.5	4.0
20.....	7.6					270	35	17.3	7.6	4.0
21.....	7.6		.5		4.0	259	31	17.3	7.6	3.4
22.....	8.4					8.0	237	29	33.0	7.6
23.....	9.2					44.0	207	27	45.6	7.6
24.....	11.5					64	230	24	90.0	7.2
25.....	12.5					86	253	22	95.0	7.6
26.....	13.5		.5		113	276	24	50.4	7.6	2.8
27.....	13.5					259	299	24	42.0	7.6
28.....	14.0					546	322	24	34.6	7.6
29.....	14.0						345	24	30.0	7.6
30.....	13.0						369	24	27.8	7.6
31.....	11.5					325		23.0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	14.0	5.4	8.27	508
November.....	11.0		8.50	506
December.....			2.39	147
January.....			.20	12
February.....	546		40.2	2,230
March.....	798	207.0	414	25,500
April.....	139	22.0	48.0	2,860
May.....	95	15.9	27.7	1,700
June.....	23.0	7.2	9.88	588
July 1–29.....	6.7	2.8	4.04	232
The period.....				34,300

LITTLE MISSOURI RIVER BASIN

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.

LOCATION.—Wire gage in NE¼ sec. 27, T. 140 N., R. 102 W., at highway bridge at Medora.

DRAINAGE AREA.—6,190 square miles.

RECORDS AVAILABLE.—May 1903 to October 1908; October 1921 to September 1924; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 20,800 second-feet May 24 (gage height, 12.44 feet); no flow Jan. 21 to Feb. 21 (ice effect), Aug. 26, Sept. 22, 23.

1903-8; 1921-24; 1928-33: Maximum, 38,700 second-feet June 7, 1929 (gage height, 17.2 feet); no flow Jan. 21 to Feb. 21 (ice effect), Aug. 26, Sept. 22, 23, 1933.

REMARKS.—Records fair. Stage-discharge relation affected by ice Nov. 7 to Mar. 18. Small diversions for irrigation from headwater tributaries.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	10	306	83	b 6.0		1,120	1,610	1,040	1,390	a 119	12	0.5
2.....	11	a 290	75			1,200	1,040	825	980	147	12	.5
3.....	11	274	49			1,290	825	a 858	735	109	12	.5
4.....	11	256	49			1,390	a 724	890	705	70	12	.5
5.....	12	247	36			960	622	800	960	57	9.8	.6
6.....	19	330	31	b 0.0		890	545	960	705	52	4.3	.6
7.....	29	260	22			890	a 520	890	520	36	5.4	.6
8.....	29	159	16			1,040	495	765	426	32	4.3	.6
9.....	29	108	2			1,290	472	735	322	109	5.4	.6
10.....	35	73	2			1,290	448	678	266	240	4.3	2.1
11.....	35	73	b 2	b 0.0		1,850	a 405	622	266	650	4.3	2.1
12.....	55	39				2,210	362	960	322	735	3.2	2.1
13.....	60	32				1,850	322	1,390	266	404	5.4	2.1
14.....	78	14				1,850	322	1,340	174	284	4.3	1.0
15.....	87	15	5			1,850	362	1,290	159	202	4.3	.8
16.....	76	26	b 5	b 1.5		1,850	a 372	1,170	141	147	4.3	3.2
17.....	57	a 24				2,330	383	1,040	131	125	4.3	.8
18.....	45	23				3,440	448	1,040	125	128	3.2	.6
19.....	45	a 28				4,200	622	825	a 152	99	2.1	.5
20.....	47	33				3,140	a 503	622	180	68	2.1	.3
21.....	52	76	b 6	b 0		2,090	1,390	520	171	61	2.1	.2
22.....	57	251				1,500	1,200	472	165	59	2.1	.0
23.....	87	201				9	1,200	960	2,330	193	38	1.0
24.....	208	a 176				24	a 1,200	890	20,500	196	32	1.0
25.....	379	152				65	1,200	960	14,400	162	28	.8
26.....	354	90	b 6	b 0	152	1,390	a 1,080	9,700	139	21	.0	.4
27.....	379	97				1,730	1,200	6,990	114	12	2.1	.3
28.....	379	112				598	4,530	1,200	4,040	101	12	2.1
29.....	354	97				4,870	1,120	3,000	94	12	.9	.3
30.....	a 338	90				3,140	a 1,080	2,860	91	12	.7	.4
31.....	a 322					2,090		2,720		14	.7	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	379	10	119	7,320
November.....	330	14	132	7,860
December.....	83		15.1	928
January.....		0	2.42	149
February.....	735	0	56.6	3,140
March.....	4,870	890	1,960	121,000
April.....	1,610	322	749	44,600
May.....	20,500	472	2,790	172,000
June.....	1,390	91	341	20,300
July.....	735	12	133	8,180
August.....	12	0	4.27	263
September.....	3.2	0	.78	46
The year.....	20,500	0	531	386,000

• Interpolated.

• Estimated.

KNIFE RIVER BASIN

KNIFE RIVER AT HAZEN, N.DAK.

LOCATION.—Wire gage in NE¼ sec. 19, T. 144 N., R. 86 W., at Hazen.

RECORDS AVAILABLE.—October 1928 to August 1933 (discontinued).

DISCHARGE.—Maximum during year, 1,980 second-feet Mar. 17; maximum gage height, 14.5 feet Mar. 8 (ice effect); minimum (estimated), no flow Jan. 21 to Feb. 5 (ice effect).

1928-33: Maximum, 3,070 second-feet Feb. 21, 1930 (gage height, 23.2 feet; minimum, that of Jan. 21 to Feb. 5, 1933).

REMARKS.—Records good except those estimated for periods of ice effect, Oct. 22-27, Nov. 9 to Feb. 25, Mar. 8-11, which are fair. No record June 17-27. Some diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	3.6	56				1,810	550	64	101	12	6.8
2	3.6	50				1,730	450	60	78	12	6.8
3	3.6	50			0	1,560	380	56	64	14	6.0
4	3.6	39				1,480	352	53	53	14	6.0
5	3.6	50				1,500	325	50	50	15	6.0
6	3.6	50	15	14		1,300	224	46	50	15	
7	8.4	46				1,050	159	46	50	13	
8	11	46			8	1,040	140	46	43	13	
9	11	46				1,030	105	50	41	14	
10	11					1,020	97	46	40	15	
11	12					1,010	89	45	35	15	
12	12					996	89	44	29	14	
13	15					1,070	81	43	27	14	
14	15					1,200	81	43	23	14	
15	15	20				1,350	81	44	21	12	
16	15		5	7		1,540	81	42	21	11	
17	15					1,980	89	43		11	
18	18				7	1,980	89	39		10	
19	22					1,730	89	37		10	
20	26					1,470	89	37		9.2	
21	30					1,310	113	38		9.2	
22						872	140	39		8.0	
23						787	140	40		8.0	
24						550	436	70		8.0	
25	28					535	286	260		6.8	
26		35	14	0	89	580	179	658		6.0	
27					565	722	81	408		6.0	
28	27				1,370	787	78	380	14	6.0	
29	22					996	64	273	12	4.4	
30	27					1,160	64	236	12	6.0	
31	35					770		212		6.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	35	3.6	17.3	1,060
November	56		33.4	1,990
December			11.4	701
January		0	6.8	418
February	1,370	0	77.5	4,300
March	1,980	535	1,190	73,200
April	550	64	174	10,400
May	658	37	114	7,010
July	15	4.4	10.7	658
August 1-5	6.8	6.0	6.32	63

HEART RIVER BASIN

HEART RIVER AT SUNNY, N.DAK.

LOCATION.—Chain gage in NE¼ sec. 25, T. 39 N., R. 82 W., at highway bridge 0.9 mile west of Sunny.

DRAINAGE AREA.—3,320 square miles.

RECORDS AVAILABLE.—April to September 1924; March 1928 to June 1933 (discontinued).

DISCHARGE.—Maximum during year, 2,530 second-feet Mar. 19; maximum gage height, 17.04 feet Mar. 3 (ice effect); no flow Jan. 16 to Feb. 18 (ice effect).

1924, 1928-33: Maximum, 3,400 second-feet Feb. 28, 1932; maximum gage height, 20.36 feet Mar. 18, 1930 (ice effect); no flow Aug. 20, 1929, Aug. 24, 1932, Jan. 16 to Feb. 20, 1933.

REMARKS.—Records fair except those during periods of ice effect, Nov. 6 to Mar. 31, which are poor. No diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	14	28	40	14		524	1,020	136	218
2.....	20	28				870	870	118	196
3.....	20	32				1,240	564	109	175
4.....	20	32				1,600	52	92	156
5.....	20	32				1,980	374	89	146
6.....	22	14.5			0	1,920	30	86	136
7.....	22					1,860	253	86	136
8.....	22					1,540	218	92	127
9.....	22					1,480	20	109	87
10.....	22					1,420	19	89	78
11.....	19	7.5	13	0		1,730	19	89	73
12.....	19					1,730	185	87	68
13.....	22					2,050	175	86	60
14.....	22					2,180	165	84	50
15.....	22					1,980	165	84	43
16.....	22	14.5	18		.3	2,050	165	79	33
17.....	19					2,120	156	74	31
18.....	19					2,180	156	72	25
19.....	22					2,530	146	73	23
20.....	24					2,390	146	72	24
21.....	26	14.5		0	.6	2,180	118	74	24
22.....	26					1,020	156	76	25
23.....	26					920	165	94	331
24.....	28					824	18	1,130	266
25.....	28					824	19	2,460	30
26.....	30				16	918	278	2,320	27
27.....	30					79	968	968	20
28.....	32					146	1,790	196	486
29.....	32					2,120	165	374	16
30.....	30					1,790	146	524	13
31.....	30					1,180	241	241	241

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	32	14	23.6	1,450
November.....	32		14.8	881
December.....			23.4	1,440
January.....		0	4.92	303
February.....	146	0	8.83	490
March.....	2,530	524	1,610	99,000
April.....	1,020	118	268	15,900
May.....	2,460	72	340	20,900
June.....	331	13	88.4	5,260
The period.....				146,000

CANNONBALL RIVER BASIN

CANNONBALL RIVER NEAR TIMMER, N.DAK.

LOCATION.—Chain gage in NW¼ sec. 21, T. 133 N., R. 82 W., 4 miles southeast of Timmer and 4 miles above mouth of Dogtooth Creek.

DRAINAGE AREA.—3,650 square miles.

RECORDS AVAILABLE.—June 1903 to November 1908; August 1911 to September 1918; October 1921 to September 1922; October 1923 to September 1924; March 1928 to September 1933.

DISCHARGE.—Maximum during year, 1,350 second-feet Mar. 18–21 (ice present); maximum gage height, 11.82 feet Mar. 20; no flow at times.

1903–8, 1911–18, 1921–24, 1928–33: Maximum, 8,600 second-feet June 10, 1932 (gage height, 12.66 feet); maximum gage height, 12.7 feet Feb. 20, 1930 (ice effect); no flow at times during periods 1904–8, 1913, 1929, 1931, 1933.

REMARKS.—Records fair except those during periods of ice effect, Nov. 9 to Mar. 24, which are poor. No diversions.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Sept.
1	0.5	14		75	324	62	88	20	0
2	.4	13		83	424	62	51	20	0
3	.3	10		170	390	54	77	20	3.8
4	.2	6.8		231	356	51	77	11	3.0
5	.2	11		475	407	49	59	3.8	1.8
6	.2	10		624	340	49	44	8.2	.6
7	1.1	8.5		624	276	49	39	11	0
8	2.4	6.8		775	231	62	32	4.6	1.2
9	2.8			835	218	57	34	12	.6
10	1.9			970	180	54	23	6.2	2.4
11	1.7	5.0		670	170	61	77	3.0	1.2
12	2.6			670	152	51	110	3.8	2.4
13	3.0			720	143	46	80	6.2	1.2
14	1.7			624	134	39	68	13	1.2
15	1.1			635	118	39	49	11	.6
16	.8			1,120	102	39	41	2.4	1.2
17	.7			1,270	95	37	35	1.8	0
18	1.5			1,350	95	37	26	.6	0
19	8.9			1,350	80	35	20	0	0
20	8.9			1,350	80	30	12	0	0
21	8.9			1,350	80	28	7	0	0
22	12			1,190	71	30	23	0	0
23	17		12	835	65	65	19	0	0
24	19		25	775	65	102	14	22	0
25	13		80	670	71	407	12	16	0
26	6.8		110	460	71	720	12	11	0
27	6.8		160	498	65	424	11	4.6	0
28	9.3		126	460	65	260	7	3.0	0
29	12			356	62	170	3.8	0	0
30	10			340	62	134	6.2	0	0
31	6.8			340		110		0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	19	0.2	5.24	322
November 1–12	14		8.34	198
February 23–28	160	12	85.5	1,020
March	1,350	75	706	43,400
April	424	62	166	9,880
May	720	28	110	6,760
June	110	3.8	38.6	2,300
July	22	0	6.94	427
September	3.8	0	.70	42

NOTE.—No flow during August. No record Nov. 13 to Feb. 22.

GRAND RIVER BASIN

GRAND RIVER NEAR WAKPALA, S.DAK.

LOCATION.—Chain gage in sec. 26, T. 19 N., R. 29 E., at highway bridge 5 miles south of Wakpala.

DRAINAGE AREA.—5,640 square miles.

RECORDS AVAILABLE.—August 1923 to September 1933; September 1911 to March 1918 at point 5 miles upstream.

DISCHARGE.—Maximum during year, 1,830 second-feet May 27; no flow Aug. 16–22, 25–30, Sept. 6.

1911–18, 1928–33: Maximum, 7,130 second-feet June 17, 19, 1915; no flow at times.

REMARKS.—Records fair. Discharge during period of ice effect, Nov. 11 to Mar. 22, were estimated on basis of two field estimates and temperature records. No diversions or regulation.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	4	38	6		2	150	695	112	303	11	1	4
2.....	4	36					805	100	263	11	1	2
3.....	3	32					630	91	205	11	1	1
4.....	3	35					519	82	210	9	1	.5
5.....	3	45					421	78	331	10	.8	.1
6.....	3	56	4		2	100	342	74	292	13	.7	0
7.....	3	60					303	78	248	16	.7	.2
8.....	3	58					260	84	205	29	.6	.5
9.....	3	57					215	91	164	56	.5	.4
10.....	3	57					190	98	124	83	.5	.2
11.....	3	20		2	5	150	164	105	103	47	.4	.1
12.....	3						143	112	96	41	.4	.1
13.....	3						128	118	88	31	.3	.3
14.....	3						122	124	77	19	.2	47
15.....	3						122	282	71	12	.1	38
16.....	3	6			20	400	126	425	63	5	0	29
17.....	4						128	278	51	2	0	23
18.....	5						157	208	44	2	0	10
19.....	10						132	159	36	10	0	4
20.....	13						750	116	126	31	12	0
21.....	14	8	2			60	800	101	107	28	14	0
22.....	17						900	89	93	27	16	0
23.....	19						1,060	84	100	27	10	.2
24.....	19						1,140	80	218	27	16	.2
25.....	22						905	88	1,220	25	10	0
26.....	22				80		825	192	1,360	22	4	0
27.....	26						600	178	1,540	17	.9	0
28.....	30						409	145	1,440	15	.8	0
29.....	27						361	132	735	14	.8	0
30.....	25						320	118	568	14	.8	0
31.....	29						510	389		.9	6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	30	3	10.7	658
November.....	60		22.8	1,360
December.....			^b 3.0	184
January.....			^b 2.0	123
February.....			^b 24.5	1,360
March.....	1,140		393	24,200
April.....	805	80	231	13,700
May.....	1,540	74	342	21,000
June.....	331	14	107	6,370
July.....	83	.8	16.3	1,000
August.....	6	0	.5	31
September.....	47	0	5.62	334
The year.....	1,540	0	97.2	70,300

^a Result of field estimate.

^b Estimated.

MOREAU RIVER BASIN

MOREAU RIVER AT PROMISE, S.DAK.

LOCATION.—Chain gage in sec. 17, T. 16 N., R. 29 E., three-quarters of a mile north of Promise and half a mile below Virgin Creek.

DRAINAGE AREA.—5,220 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, about 12,600 second-feet May 26 (gage height, 16.8 feet); no flow at times.

1928-33: Maximum, about 13,400 second-feet Sept. 17, 1928 (gage height, 14.6 feet); no flow at times.

REMARKS.—Records good except those for period of ice effect, Feb. 21 to Mar. 22, which were estimated. No diversions or regulation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.6			748	65	429	17	0	5
2	.3	.9			540	127	399	20	0	4
3	.3	.8		125	446	105	426	17	0	4
4	.2	24			374	79	262	14	0	2
5	.2	24			280	67	450	11	0	0
6	.2	24			238	60	368	11	0	6
7	.3	33			200	57	258	11	0	2
8	.3	24		75	174	49	231	13	0	.4
9	.2	10			153	72	226	12	0	.4
10	.1				135	143	178	13	0	.2
11	0		0		123	176	152	18	0	1
12	.1				109	222	131	16	0	0
13	.1			40	90	586	110	13	0	0
14	.1				79	672	92	10	0	0
15	.1				65	1,270	79	13	0	0
16	0				55	1,050	67	11	0	0
17	0				55	1,220	58	12	0	0
18	0			75	50	832	48	11	0	0
19	.2				57	540	46	10	0	6
20	.3	0			74	362	43	8	0	28
21	.4			150	54	268	34	6	0	22
22	.5			225	40	243	32	5	0	17
23	.5		25	320	34	248	29	5	0	12
24	.5			305	752	392	28	4	152	10
25	.4			268	1,460	1,590	27	3	119	8
26	.4			280	700	10,900	24	2	48	7
27	.3		80	478	450	11,000	22	.8	36	5
28	.4			868	310	5,220	20	.4	20	5
29	.4			640	231	2,070	20	.2	13	4
30	.4			450	178	1,190	18	0	10	4
31	.5			1,020		705		0	7	
Month	Maximum		Minimum		Mean		Run-off in acre-feet			
October	0.5		0		0.26		16			
November	33		0		4.71		280			
February					13.0		722			
March	1,020				212		13,000			
April	1,460		34		275		16,400			
May	11,000		49		1,340		82,400			
June	450		18		144		8,570			
July	20		0		9.27		570			
August	152		0		13.1		806			
September	28		0		4.89		291			
The year	11,000		0		170		123,000			

NOTE.—No flow during months omitted.

CHEYENNE RIVER BASIN

CHEYENNE RIVER AT EDMONT, S.DAK.

LOCATION.—Chain gage in sec. 36, T. 8 S., R., 2 E., at Edgemont, 600 feet above Cottonwood Creek. Zero of gage is 3,416.2 feet above mean sea level.

DRAINAGE AREA.—6,050 square miles.

RECORDS AVAILABLE.—June 1903 to November 1906; April 1928 to February 1933 (discontinued).

DISCHARGE.—Maximum discharge during year, 47 second-feet Oct. 21, 29 (gage height, 1.88 feet); minimum (estimated), 1 second-foot Nov. 14, 15.

1903-6, 1928-33: Maximum, 10,500 second-feet June 3, 1929 (gage height, 7.86 feet); no flow Jan. 5, 1929, and several days during June, July, and September 1931.

Maximum stage known, 12.0 feet about May 1, 1922.

REMARKS.—Records fair. Discharge estimated Nov. 12-20, Dec. 1 to Feb. 28, on the basis of two discharge measurements and temperature records. Minor diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Day	Oct.	Nov.	Jan.	Feb.
1.....	3	15	-----	-----	16.....	10	2	-----	-----
2.....	2	23	-----	-----	17.....	11	4	-----	-----
3.....	2	20	-----	-----	18.....	13	6	-----	-----
4.....	2	18	-----	-----	19.....	2	8	-----	-----
5.....	2	19	-----	-----	20.....	6	10	-----	-----
6.....	3	19	-----	-----	21.....	32	15	-----	° 9
7.....	3	19	-----	-----	22.....	18	16	-----	-----
8.....	9	12	-----	-----	23.....	17	10	-----	-----
9.....	15	16	-----	-----	24.....	16	12	-----	-----
10.....	18	3	-----	-----	25.....	8	11	-----	-----
11.....	12	2	-----	-----	26.....	9	10	-----	-----
12.....	13	2	-----	-----	27.....	16	11	-----	-----
13.....	13	2	° 11	-----	28.....	32	23	-----	-----
14.....	13	1	-----	-----	29.....	16	23	-----	-----
15.....	11	1	-----	-----	30.....	26	22	-----	-----
					31.....	18	-----	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	32	2	12.0	738
November.....	23	1	11.8	702
December.....	-----	-----	10	615
January.....	-----	-----	12	738
February.....	-----	-----	8	444
The period.....	-----	-----	-----	3,240

- Result of discharge measurement.
- ° Estimated.

CHEYENNE RIVER NEAR CARLIN, S.DAK.

LOCATION.—Chain gage in sec. 31, T. 9 N., R. 24 E., 4 miles northeast of Carlin and half a mile above Hermaphrodite Creek.

DRAINAGE AREA.—23,400 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, about 104,000 second-feet May 24 (gage height, 15.0 feet); minimum not determined, but probably occurred during winter.

1928-33: Maximum, that of May 24, 1933; minimum not determined.

Maximum floods known, 18.1 feet in May 1920 and 1927.

REMARKS.—Records good except those for period of ice effect, Nov. 6 to Mar. 14, which were based on two discharge measurements and temperature records.

Minor diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	207	401				1,050	1,620	5,040	490	290	7,150
2	216	378				837	1,600	4,510	632	305	4,080
3	229	351		a 70	a 200	735	2,060	3,830	614	315	2,480
4	233	335				677	1,420	3,420	557	325	2,010
5	242	325				641	1,870	3,150	449	455	1,800
6	252					573	2,080	2,850	407	449	1,350
7	261					525	2,110	2,420	476	395	1,180
8	271	a 300		a 30	a 180	504	1,340	2,150	407	497	1,050
9	280					497	1,460	1,930	437	581	900
10	290					476	2,990	1,760	1,270	525	848
11	290					462	5,040	1,660	848	373	755
12	310				a 800	449	3,290	1,760	677	325	795
13	346	a 200		a 35		462	3,940	1,520	597	300	858
14	401				3,500	476	4,910	1,430	504	266	868
15	373				5,430	455	3,060	1,390	407	252	868
16	346				4,970	437	2,440	1,340	686	233	1,080
17	325				4,480	419	3,320	1,180	705	224	1,010
18	315	a 150		a 40	3,970	395	2,180	1,030	565	229	996
19	300				2,380	384	1,790	948	483	211	848
20	310				1,640	395	1,500	890	419	198	725
21	300			40	1,200	17,900	1,220	755	407	182	614
22	300			b 41	996	10,700	1,120	668	378	340	533
23	315	a 170			936	6,880	5,260	614	330	325	469
24	346			a 60	848	6,950	66,600	511	285	407	431
25	368				785	4,910	76,800	686	238	549	401
26	368				765	2,670	32,500	1,060	280	715	378
27	378		b 75	a 150	745	1,900	23,200	1,190	340	924	401
28	395	a 180			848	1,550	14,400	936	346	960	401
29	413				1,420	1,460	8,950	565	315	1,460	431
30	413				1,070	1,690	7,030	504	271	15,000	413
31	437				1,100		5,930		266	18,400	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	437	207	317	19,500
November	401		226	13,400
December			a 100	6,150
January			a 90	5,530
February			a 56.6	3,140
March	5,430		1,330	81,800
April	17,900	384	2,250	134,000
May	76,800	1,120	9,450	581,000
June	5,040	504	1,720	102,000
July	1,270	238	487	29,900
August	18,400	182	1,480	91,000
September	7,150	378	1,200	71,400
The year	76,800		1,580	1,140,000

a Estimated.

b Result of discharge measurement.

RAPID CREEK AT BIG BEND, S.DAK.

LOCATION.—Water-stage recorder in sec. 9, T. 1 N., R. 6 E., at Big Bend.

DRAINAGE AREA.—332 square miles.

RECORDS AVAILABLE.—March 1915 to September 1917; April 1932 to September 1933.

DISCHARGE.—Maximum during year, 1,570 second-feet May 24 (gage height, 5.20 feet); minimum, 4 second-feet Dec. 9 (gage height, 0.39 foot).

1915-17, 1932-33: Maximum, that of May 24, 1933; minimum, that of Dec. 9, 1932.

REMARKS.—Records good except those for period of ice effect, Nov. 9 to Mar. 29, which are estimated on the basis of two discharge measurements and temperature records. Flow of creek regulated by power plant 100 feet above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	39	40			a 35	78	294	345	81	50	50
2	32	39	37				74	260	332	77	52	45
3	32	44	37				62	240	298	79	53	40
4	36	39	31				66	240	273	79	50	42
5	35	37	28				57	228	244	75	46	40
6	34	38	14			a 25	43	220	216	91	42	38
7	34	44	11				65	228	200	114	43	38
8	34	31	5				66	209	191	98	41	41
9	39	28	4				71	216	175	85	44	45
10	37	34	6				56	216	158	88	52	46
11	45	30				a 40	45	206	165	74	47	46
12	46	34					49	212	163	71	42	42
13	47	35	a 10	b 31			38	212	147	73	41	41
14	44	36					44	209	154	66	41	40
15	31	22					61	206	145	68	40	40
16	37	25				a 45	65	203	126	72	38	40
17	38	30					85	194	117	75	38	40
18	37	34	a 20				108	185	112	73	37	38
19	37	37					117	180	103	75	35	38
20	28	39			b 31		151	206	112	62	36	36
21	33	38				a 60	115	212	114	61	43	36
22	44	42					103	236	108	60	45	35
23	45	31					143	662	117	58	46	35
24	45	28					206	1,440	136	57	49	35
25	38	38	a 30				244	965	143	49	43	36
26	43	34				a 70	294	789	112	62	46	38
27	43	34					328	640	97	53	56	38
28	44	38					336	538	90	52	74	39
29	35	38					336	490	85	53	88	38
30	38	39					80	328	428	83	51	67
31	36					75		380		47	54	---

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	47	28	38.4	2,360
November	44	22	35.2	2,090
December	40	4	22.5	1,380
January			30	1,840
February			26	1,440
March	80		47.1	2,900
April	336	38	128	7,620
May	1,440	180	359	22,100
June	345	83	162	9,640
July	114	47	70.3	4,320
August	88	35	47.7	2,930
September	60	35	39.8	2,370
The year	1,440	4	84.2	61,000

a Estimated.

b Result of discharge measurement.

BELLE FOURCHE RIVER NEAR BELLE FOURCHE, S.DAK.

LOCATION.—Staff gage in sec. 2, T. 8 N., R. 2 E., at diversion dam of Belle Fourche irrigation project $1\frac{1}{2}$ miles below Belle Fourche.

DRAINAGE AREA.—4,310 square miles.

RECORDS AVAILABLE.—May to November 1906; January 1912 to September 1933.

DISCHARGE.—Maximum during year, 5,090 second-feet May 25 (gage height, 13.40 feet); minimum, 8 second-feet Aug. 21 (gage height, 2.40 feet).

1912-33: Maximum, 22,400 second-feet Apr. 9, 1924; no flow for several days during 1914 and 1919.

REMARKS.—Diversions for irrigation above station. Flow regulated by Belle Fourche reservoir, capacity, 203,770 acre-feet. Records include amount diverted at Belle Fourche diversion dam. Complete records furnished by United States Bureau of Reclamation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	96	151	99	158	149	142	223	681	483	159	19	66
2.....	99	149	104	180	149	142	213	953	596	139	20	71
3.....	91	146	93	170	80	144	245	527	483	139	21	71
4.....	98	144	74	162	138	146	258	460	297	120	20	85
5.....	111	141	74	158	150	138	240	407	297	121	20	83
6.....	127	141	74	162	80	144	223	465	301	118	19	97
7.....	110	143	73	146	88	154	228	410	349	111	31	94
8.....	113	136	66	139	120	945	215	421	221	112	55	69
9.....	117	135	58	146	88	277	225	503	221	79	52	117
10.....	131	134	61	144	77	183	223	579	221	65	16	139
11.....	146	130	67	144	117	197	215	536	221	58	16	95
12.....	134	133	67	170	117	315	215	959	173	47	13	100
13.....	121	134	192	139	126	634	208	609	173	36	14	112
14.....	116	136	71	141	125	2,800	177	384	173	36	15	325
15.....	116	134	71	142	126	1,500	183	558	131	35	15	241
16.....	138	134	86	130	101	1,200	186	707	215	35	14	240
17.....	135	151	86	77	136	780	189	553	185	34	14	172
18.....	136	135	86	114	136	550	194	553	171	30	14	173
19.....	156	134	86	130	136	530	217	460	161	20	14	174
20.....	55	129	114	149	136	470	595	440	139	17	10	187
21.....	37	135	149	154	142	408	700	407	139	17	8	158
22.....	52	132	86	144	146	348	890	223	139	17	11	154
23.....	80	132	86	149	154	308	1,220	3,890	140	16	21	132
24.....	81	129	86	154	158	284	550	4,180	120	17	15	130
25.....	81	135	114	154	162	276	680	5,090	120	17	18	131
26.....	81	129	114	144	150	268	678	3,610	120	17	21	135
27.....	169	131	114	136	146	252	655	2,190	166	19	44	133
28.....	159	135	114	146	146	216	758	1,330	319	18	56	131
29.....	151	134	114	144	-----	245	744	1,080	236	17	80	128
30.....	150	135	191	142	-----	235	726	706	203	18	84	124
31.....	154	-----	155	144	-----	223	-----	786	-----	18	56	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	169	37	114	7,010
November.....	151	129	137	8,150
December.....	192	58	97.6	6,000
January.....	180	77	146	8,980
February.....	162	77	128	7,110
March.....	2,800	138	466	28,700
April.....	1,220	177	409	24,300
May.....	5,090	223	1,150	70,700
June.....	596	120	230	13,700
July.....	159	16	54.9	3,380
August.....	84	8	26.6	1,640
September.....	325	66	135	8,030
The year.....	5,090	8	259	188,000

WHITE RIVER BASIN

WHITE RIVER AT CRAWFORD, NEBR.

LOCATION.—Staff gage in sec. 10, T. 31 N., R. 52 W., half a mile west of Crawford.

DRAINAGE AREA.—295 square miles.

RECORDS AVAILABLE.—July to December 1897; February 1931 to September 1933.

DISCHARGE.—Maximum during year, 1,080 second-feet by slope-area method Aug. 28 (gage height, 10.3 feet); minimum, 10 second-feet Sept 29–30 (gage height, 1.66 feet).

1931–33: Maximum, that of Aug. 28, 1933; minimum, 9 second-feet Sept. 6–15, 1931 (gage height, 1.52 feet).

REMARKS.—Records good except those for periods of ice effect, Nov. 8–11, 15–16, Dec. 4 to Feb. 28, Mar. 6–9, which were estimated on the basis of three discharge measurements and temperature records. Small diversions for irrigation above station.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	30	24			24	24	34	34	15	15	22
2	17	30	24			26	24	34	33	15	17	20
3	17	30	24			29	24	34	32	17	16	18
4	17	30	24		a 38	32	24	34	32	17	15	17
5	17	24	24			29	24	34	31	16	15	16
6	17	20				25	24	34	30	18	15	15
7	18	20				24	24	34	30	20	15	15
8	18	20	b 22			23	24	34	30	20	15	14
9	20	20				22	24	34	29	20	17	14
10	22	20				24	24	42	29	22	16	14
11	22	20				24	23	48	28	20	15	140
12	21	24				24	22	47	27	19	15	53
13	21	29	b 18	a 26		29	22	42	26	18	15	41
14	20	34				29	22	39	25	18	15	24
15	20	30				29	22	38	24	19	15	20
16	20	26				29	22	35	24	19	14	17
17	20	24				29	22	35	24	19	14	14
18	20	24	b 22			29	22	30	24	19	14	12
19	20	22				29	22	30	22	18	14	11
20	23	24				29	94	29	22	18	14	10
21	26	24				29	134	38	21	17	14	10
22	20	24				29	104	38	20	17	14	12
23	20	24				29	45	42	19	17	83	12
24	20	24				26	45	42	19	16	28	10
25	20	24				24	44	40	19	16	23	11
26	26	24	b 26			23	42	37	19	15	20	11
27	26	24				23	42	35	18	15	15	11
28	30	24				24	39	62	17	14	375	11
29	30	24				24	36	33	17	14	103	10
30	26	24				24	35	33	16	14	35	10
31	30					24		33		14	24	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	30	17	21.3	1,310
November	34	20	24.7	1,470
December			b 23.1	1,420
January			b 26.0	1,600
February			b 30.0	1,670
March	32	22	26.4	1,620
April	134	22	36.6	2,180
May	62	29	37.2	2,290
June	34	16	24.7	1,470
July	22	14	17.3	1,060
August	375	14	33.4	2,050
September	140	10	20.5	1,220
The year	375	10	26.7	19,400

a Result of discharge measurement.

b Estimated.

WHITE RIVER NEAR CHADRON, NEBR.

LOCATION.—Chain gage in sec. 18, T. 33 N., R. 49 W., 2 miles below mouth of Dead Horse Creek, 6 miles west of Chadron.

DRAINAGE AREA.—750 square miles.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year, 992 second-feet Apr. 21 (gage height, 16.8 feet); minimum, 2 second-feet Oct. 1 (gage height, 0.90 foot).

1931-33: Maximum, that of Apr. 21, 1933; no flow Aug. 6-8, Sept. 6-9, 1932.

REMARKS.—Records fair. Discharge estimated during periods of ice effect, Nov. 11-16, Dec. 4 to Mar. 13, on basis of two discharge measurements and temperature records. Diversions for irrigation above station.

Daily discharge, in second-feet, for high-water periods in 1932

Apr. 24..... 1,290 | May 6..... 646
Apr. 25..... 646

NOTE.—Records for above periods not previously published because of lack of definition of rating curve for high stages.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3	5	5	-----	-----	12	20	41	22	8	15
2.....	4	7	5	-----	-----	14	20	39	23	16	9
3.....	6	5	6	* 13	20	10	29	47	58	51	5
4.....	8	5	6	-----	-----	11	49	45	24	26	6
5.....	8	5	6	-----	-----	10	56	39	16	11	3
6.....	6	5	-----	-----	-----	9	58	41	13	10	5
7.....	6	6	-----	-----	-----	8	49	41	17	8	5
8.....	9	6	5	-----	25	9	49	35	18	7	5
9.....	7	10	-----	-----	-----	11	47	31	14	5	3
10.....	8	11	-----	-----	-----	12	119	26	10	11	3
11.....	13	12	-----	-----	30	18	355	28	8	5	9
12.....	17	11	-----	-----	80	18	128	24	8	6	88
13.....	13	13	4	-----	120	16	90	22	7	7	158
14.....	8	11	-----	-----	194	12	68	16	6	8	29
15.....	4	10	-----	-----	131	11	53	15	10	7	24
16.....	6	11	-----	-----	116	9	53	13	10	5	17
17.....	7	12	-----	-----	104	8	49	14	14	7	18
18.....	6	9	4	-----	96	8	49	16	47	6	17
19.....	8	8	-----	-----	86	9	324	14	15	7	16
20.....	10	6	-----	-----	76	394	650	14	8	8	16
21.....	9	6	-----	-----	68	1,090	113	13	9	7	16
22.....	8	7	-----	-----	63	384	80	13	8	8	16
23.....	16	7	6	-----	66	155	670	15	9	8	15
24.....	21	7	-----	-----	68	63	402	14	7	7	12
25.....	13	8	-----	-----	60	49	98	16	8	420	11
26.....	9	7	-----	-----	35	35	68	18	8	530	5
27.....	6	6	-----	-----	15	35	58	18	7	53	5
28.....	6	6	8	-----	14	28	221	20	5	659	4
29.....	5	6	-----	-----	12	26	143	28	8	278	5
30.....	5	5	-----	-----	13	22	60	20	8	58	4
31.....	5	-----	-----	-----	10	-----	43	-----	8	17	-----

* Result of discharge measurement.

Discharge, in second-feet, of White River near Chadron, Nebr., 1932-33—Contd.

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October.....	61	0.4	8.13	500
November.....			15	893
December.....			25	1,540
January.....			25	1,540
February.....			35	2,010
March.....			33.5	2,060
April.....	1,290	5	84.9	5,050
May.....	646	11	47.4	2,910
June.....	38	2	13.9	827
July.....	50	1	5.8	357
August.....	135	0	13.1	806
September.....	9	0	4.0	238
The year.....	1,290	0	25.8	18,700
1932-33				
October.....	21	3	8.4	516
November.....	13	5	7.8	464
December.....			^b 5.5	338
January.....			^b 12	738
February.....			^b 9	500
March.....	194	10	54.3	3,340
April.....	1,090	8	82.9	4,930
May.....	670	20	138	8,480
June.....	47	13	24.5	1,460
July.....	58	5	14	861
August.....	659	5	73.0	4,490
September.....	158	3	18.1	1,080
The year.....	1,090		37.5	27,200

^b Estimated.

NOTE.—Monthly discharge for April and May 1932 not previously published because of lack of definition of rating curve for high stages.

WHITE RIVER NEAR OACOMA, S.DAK.

LOCATION.—Chain gage in sec. 21, T. 103 N., R. 72 W., 6 miles southwest of Oacoma.

DRAINAGE AREA.—10,100 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 6,580 second-feet Sept. 1 (gage height, 5.3 feet); minimum, 14 second-feet Nov. 10 (discharge measurement).

1928-33: Maximum, 12,100 second-feet May 8, 1932 (gage height, 6.8 feet); minimum, that of Nov. 10, 1932.

REMARKS.—Records fair. Discharge estimated during periods of ice effect, Nov. 8-10, Nov. 19 to Mar. 22, on basis of three discharge measurements and temperature records. No diversions or regulation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	55	134	-----	} a 40	} a 200	492	620	660	45	20	4, 180
2.....	58	116	-----			424	596	816	39	25	1, 850
3.....	60	109	-----			356	484	756	41	24	1, 320
4.....	67	102	-----			325	450	431	44	21	1, 220
5.....	79	98	-----			310	533	265	50	18	1, 120
6.....	73	95	-----	} a 20	} a 175	290	564	195	51	130	944
7.....	67	97	-----			281	756	178	412	387	596
8.....	70	50	-----			271	1, 170	170	116	345	418
9.....	71	40	-----			266	1, 390	158	45	265	306
10.....	76	14	-----			252	1, 610	126	45	164	245
11.....	79	76	-----	} a 25	} a 200	247	1, 960	109	51	128	192
12.....	82	79	-----			229	2, 320	88	28	114	160
13.....	120	86	-----			229	2, 260	72	280	98	136
14.....	82	92	-----			215	1, 470	58	143	74	126
15.....	79	92	-----			198	1, 280	48	124	95	116
16.....	76	64	-----	} a 50	} a 350	211	1, 630	63	146	208	107
17.....	98	67	-----			229	2, 140	48	126	74	100
18.....	122	73	b 56			206	1, 500	40	116	39	90
19.....	138	70	-----			400	186	710	35	103	40
20.....	146	75	-----			450	174	438	34	105	41
21.....	126	} a 80	-----	} a 80	500	166	412	37	120	44	85
22.....	116		-----		650	155	405	40	124	84	405
23.....	118		-----		730	149	381	44	126	80	301
24.....	114		-----		768	1, 220	280	71	124	51	231
25.....	102		-----		758	1, 980	275	71	93	62	167
26.....	92	} a 150	-----	} a 150	702	1, 200	2, 160	65	85	51	128
27.....	97		-----		635	1, 590	1, 560	62	63	42	105
28.....	96		-----		608	1, 340	1, 220	62	51	42	84
29.....	95		-----		572	1, 100	1, 080	65	36	1, 390	72
30.....	158		-----		554	840	970	56	24	2, 840	68
31.....	149	-----	-----	-----	538	-----	792	-----	24	2, 840	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	158	55	95.5	5, 870
November.....	134	14	81.0	4, 820
December.....	-----	-----	a 60.0	3, 690
January.....	-----	-----	a 65.0	4, 000
February.....	-----	-----	a 55.5	3, 080
March.....	768	-----	380	23, 400
April.....	1, 980	149	504	30, 000
May.....	2, 320	275	1, 080	66, 400
June.....	816	34	164	9, 760
July.....	412	24	96.1	5, 910
August.....	2, 840	18	317	19, 500
September.....	4, 180	68	502	29, 900
The year.....	4, 180	14	285	206, 000

a Estimated.

b Result of discharge measurement.

NIOBRARA RIVER BASIN

NIOBRARA RIVER AT DUNLAP, NEBR.

LOCATION.—Staff gage on line between secs. 26 and 27, T. 29 N., R. 48 W., at Dunlap, half a mile above Cottonwood Creek.

DRAINAGE AREA.—1,550 square miles.

RECORDS AVAILABLE.—February 1931 to September 1933.

DISCHARGE.—Maximum during year, 1,270 second-feet Aug. 26 (gage height, 10.62 feet); minimum, 3 second-feet Oct. 1, 4, 5, 6, 8, 11.

1931-33: Maximum, that of Aug. 26, 1933; minimum, 1 second-foot Sept. 22, 1932 (gage height, 1.80 feet).

REMARKS.—Monthly records poor. Daily records not sufficiently accurate for publication. Discharge estimated Dec. 10 to Feb. 27 on the basis of two discharge measurements and temperature records. No diversions or regulation.

Discharge, in second-feet, 1932-33

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	52	3	18.6	1,140
November.....	69	38	47.1	2,800
December.....			• 52.6	3,230
January.....			• 77.0	4,730
February.....			• 65.0	3,610
March.....	114	71	89.0	5,470
April.....	121	69	84.7	5,040
May.....	95	69	81.6	5,020
June.....	300	16	43.8	2,610
July.....	16	5	10.8	664
August.....	400	15	58.9	3,620
September.....	86	48	65.8	3,920
The year.....	400	3	57.8	41,900

• Estimated.

NIOBRARA RIVER NEAR SPENCER, NEBR.

LOCATION.—At power plant of Northern Nebraska Power Co. in N½ sec. 30, T. 33 N., R. 11 W., 5 miles southeast of Spencer.

DRAINAGE AREA.—10,800 square miles.

RECORDS AVAILABLE.—May to December 1908, August 1927 to September 1933.

DISCHARGE.—Maximum during year, 10,700 second-feet July 11, minimum, 10 second-feet (leakage through gates) at times.

1927-33: Maximum, 15,200 second-feet Sept. 6, 1930; minimum, 10 second-feet (leakage through gates) at times.

REMARKS.—Records good. Spencer Reservoir capacity greatly reduced by filling up with sand; practically no regulation. Discharge computed from flow over spillway and through turbines and gates. Base data furnished by Northern Nebraska Power Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	903	1,100	1,340	1,120	1,070	3,060	1,350	1,860	981	604	609	1,130
2.....	830	1,110	1,250	1,110	1,090	2,840	1,300	1,560	903	638	1,290	986
3.....	1,010	1,050	1,290	1,160	1,100	2,610	1,360	1,480	897	598	1,080	968
4.....	1,100	1,070	1,210	1,190	1,050	2,380	1,340	1,620	959	594	897	944
5.....	1,120	1,110	1,190	1,220	996	1,900	1,280	1,730	983	559	757	837
6.....	1,120	1,070	952	1,440	900	1,560	1,260	1,620	891	643	699	765
7.....	1,020	1,090	348	1,410	776	2,000	1,210	1,830	965	1,150	722	789
8.....	1,040	1,040	218	1,400	595	1,850	1,160	1,930	1,280	841	748	769
9.....	1,010	833	162	1,350	479	1,550	1,150	1,770	1,370	820	777	762
10.....	1,180	521	139	1,430	377	981	1,210	1,830	1,120	800	661	802
11.....	1,290	642	134	1,280	382	1,520	1,210	1,880	960	3,320	702	964
12.....	1,180	747	165	1,270	430	1,980	1,160	1,980	977	1,010	713	1,080
13.....	1,070	1,120	171	1,300	510	1,020	1,210	2,080	842	905	639	1,090
14.....	1,080	1,420	187	1,260	619	1,880	1,140	1,910	853	1,380	647	1,000
15.....	1,060	610	247	1,260	690	1,900	1,160	1,850	782	1,480	710	1,100
16.....	1,060	579	320	1,210	777	1,890	1,100	1,670	697	1,060	796	1,150
17.....	1,020	695	327	1,120	843	1,870	1,070	1,480	655	1,080	726	953
18.....	1,080	931	388	1,100	998	1,850	1,050	1,400	619	945	785	879
19.....	1,150	1,050	429	1,020	1,320	1,340	1,010	1,310	579	679	660	808
20.....	1,100	1,420	688	1,000	1,560	1,610	1,040	1,210	528	719	728	846
21.....	1,080	1,760	1,080	1,070	1,170	1,680	1,270	1,230	698	726	792	828
22.....	1,160	1,646	1,180	1,210	1,400	1,730	1,400	1,130	645	782	1,760	809
23.....	1,220	1,550	1,140	1,300	1,550	1,600	1,740	1,510	661	872	1,880	816
24.....	1,310	1,370	1,220	1,360	1,660	1,600	1,840	1,340	676	720	1,810	909
25.....	1,290	1,230	1,230	1,350	1,670	1,660	1,670	1,380	931	679	1,160	865
26.....	1,190	1,040	1,200	1,220	1,920	1,500	1,470	1,220	885	622	912	932
27.....	1,130	1,100	1,160	1,280	2,650	1,460	1,460	1,420	700	650	1,130	988
28.....	1,160	1,320	1,160	1,200	2,630	1,410	1,290	1,430	620	622	4,240	973
29.....	1,040	1,390	1,160	1,170	-----	1,340	1,070	1,610	619	559	2,340	887
30.....	1,030	1,470	1,120	1,160	-----	1,450	1,780	1,190	622	517	1,580	847
31.....	1,130	-----	1,110	1,140	-----	1,500	-----	1,100	-----	566	1,250	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,310	830	1,100	67,600
November.....	1,760	521	1,100	65,500
December.....	1,340	134	771	47,400
January.....	1,440	1,000	1,230	75,600
February.....	2,650	377	1,110	61,600
March.....	3,060	981	1,790	110,000
April.....	1,840	1,010	1,290	76,800
May.....	2,080	1,100	1,570	96,500
June.....	1,370	528	830	49,400
July.....	3,320	517	875	53,800
August.....	4,240	639	1,100	67,600
September.....	1,150	808	916	54,500
The year.....	4,240	134	1,140	826,000

JAMES RIVER BASIN

JAMES RIVER AT JAMESTOWN, N.DAK.

LOCATION.—Tape gage on bridge in SE¼ sec. 36, T. 140 N., R. 64 W., 1 mile southeast of Northern Pacific Railway depot at Jamestown.

DRAINAGE AREA.—3,140 square miles.

RECORDS AVAILABLE.—June 1928 to August 1933 (discontinued).

DISCHARGE.—Maximum during year, 642 second-feet Feb. 28 (gage height, 11.78 feet, ice present); no flow June 28–29, July 4–5.

1928–33: Maximum, 1,100 second-feet Mar. 14, 1929 (gage height, 14.2 feet); no flow June 28–29 and July 4–5, 1933.

REMARKS.—Records fair. No diversions.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	11	0.8	1.0	0.6	1.0	475	80	18	4.0	0.4	0.3
2	11	.4	1.2	.6	1.0	304	80	17	3.8	.4	
3	13	.8	1.0	.6	1.0	202	80	16	3.4	.2	
4	14	.4	1.0	.8	1.0	172	80	15	3.4	.0	
5	15	.6	1.0	.8		172	80	75	3.2	.0	
6	17	.6	.8	.8		148	80	29	3.4	.4	0.3
7	16	.6	.8	.8		160	86	29	3.4	.6	
8	16	.8	.8	.8	1.0	148	70	26	3.4	.6	
9	16	.8	.8	1.0		130	45	25	3.2	.6	
10	15	1.0	.8	1.0		70	36	25	3.0	2.4	
11	15	1.0	.8	1.0		66	34	24	2.8	2.4	.2
12	14	1.0	.8	1.0	1.0	113	30	23	2.6	1.0	
13	13	1.0	.6	1.0	1.0	124	29	23	2.6	.6	
14	12	1.0	.6	1.2	1.0	102	28	19	2.4	.6	
15	11	1.0	.6	1.2	1.0	86	28	16	2.4	.6	
16	11	1.0	.6	1.2	1.0	56	27	9.8	2.0	.8	.2
17	10	1.0	.6	1.2	1.0	53	26	9.5	1.4	.8	
18	11	1.0	.6	1.2	1.0	48	91	8.7	1.4	.8	
19	36	1.0	.6	1.0	1.0	45	91	9.1	1.4	.8	
20	12	1.0	.6	1.0	1.0	42	91	8.7	1.2	.8	
21	4.2	1.0	.6	1.2	1.0	42	80	8.7	1.2	1.2	-----
22	3.6	1.0	.6	1.2	1.0	44	80	30	1.2	1.0	-----
23	2.0	1.2	.6	1.2	3.4	46	70	30	1.2	.6	-----
24	.4	1.2	.6	1.2	4.2	47	51	124	1.2	.4	-----
25	.6	1.2	.8	1.2	4.0	50	52	91	.4	.4	-----
26	.6	1.0	.8	1.2	18.0	38	26	44	.2	.4	-----
27	.6	1.0	.6	1.2	221	66	18	11	.2	.4	-----
28	.4	1.0	.8	1.2	520	66	21	8.4	.0	.4	-----
29	.4	1.0	.8	1.2	-----	68	19	5.8	.0	.4	-----
30	.4	1.0	.6	1.2	-----	70	40	4.0	.4	.4	-----
31	.6	-----	.6	1.0	-----	75	-----	4.2	-----	.4	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	36	0.4	9.77	601
November	1.2	.4	.91	54
December	1.2	.6	.74	46
January	1.2	.6	1.03	63
February	520	1.0	28.3	1,570
March	475	38	177	6,580
April	91	18	55	3,279
May	124	4	25.4	1,560
June	4	0	2.01	120
July	2.4	0	.67	41
August 1–18	-----	-----	.26	9.3
The period	-----	-----	-----	13,900

JAMES RIVER NEAR SCOTLAND, S.DAK.

LOCATION.—Chain gage in SW¼ sec. 30, T. 97 N., R. 57 W., 5 miles northeast of Scotland and 200 yards above Dawson Creek.

DRAINAGE AREA.—15,800 square miles.

RECORDS AVAILABLE.—September 1928 to September 1933.

DISCHARGE.—Maximum during year, 441 second-feet July 23 (gage height, 4.08 feet); minimum not determined, but probably occurred during winter.

1928-33: Maximum, 2,970 second-feet Mar. 31, 1929 (gage height, 11.92 feet); minimum, 2 second-feet Sept. 14-18 and Oct. 28 to Nov. 1, 1931.

REMARKS.—Records fair. Discharge estimated during period of ice effect, Nov. 8 to Mar. 5, on the basis of two discharge measurements and temperature records. Operation of water power plant 20 miles upstream may affect flow slightly.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	16	9			• 30	50	112	63	14	17	14
2.....	13	7				41	140	62	13	20	16
3.....	10	8				34	119	67	73	21	17
4.....	9	10				29	106	58	26	28	12
5.....	7	9				26	94	49	12	38	11
6.....	7	8			41	34	89	48	10	24	9
7.....	7	9			31	23	88	45	17	20	8
8.....	7	7			22	36	106	51	25	19	14
9.....	7	7			25	32	123	56	25	32	20
10.....	7	7			24	20	111	49	22	34	18
11.....	6	8			23	14	105	38	12	23	14
12.....	5	7			22	26	110	24	193	17	12
13.....	6	5			24	27	116	22	75	19	11
14.....	7	4		• 3	26	24	122	26	82	15	10
15.....	8	3			26	24	120	32	84	14	19
16.....	8				43	19	120	22	73	18	21
17.....	8				54	12	120	24	58	17	10
18.....	7	• 5	• 7		51	9	116	18	38	13	9
19.....	6				28	8	108	14	32	13	9
20.....	7				26	9	106	10	26	12	8
21.....	12				28	11	110	10	26	12	12
22.....	13				33	10	104	13	41	14	15
23.....	12				30	15	80	15	315	25	13
24.....	9				31	16	80	17	307	27	11
25.....	8	• 6			35	12	122	19	167	27	13
26.....	6				55	9	112	19	96	21	11
27.....	6				41	19	91	15	57	24	9
28.....	9				31	28	71	20	46	20	8
29.....	13				36	26	68	19	40	12	8
30.....	15				31	34	84	17	34	9	10
31.....	14				50		75		22	15	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	16	5	8.9	547
November.....	10	3	6.4	381
December.....			• 4	246
January.....			• 6	369
February.....			• 5	278
March.....	55	22	32.8	2,020
April.....	50	8	22.6	1,340
May.....	140	68	104	6,400
June.....	67	10	31.4	1,870
July.....	315	10	66.5	4,090
August.....	38	9	20.0	1,230
September.....	21	8	12.4	738
The year.....	315		26.9	19,500

• Estimated.

• Result of discharge measurement.

BIG SIOUX RIVER BASIN

BIG SIOUX RIVER AT AKRON, IOWA

LOCATION.—Chain gage in sec. 31, T. 93 N., R. 48 W., at Akron.

DRAINAGE AREA.—7,080 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 10,900 second-feet Sept. 5 (gage height, 17.8 feet); minimum not determined but occurred during winter.

1928-33: Maximum, 14,000 second-feet Mar. 15, 1929 (gage height, 18.63 feet); minimum not determined.

REMARKS.—Records good except those for period of ice effect, Nov. 11 to Mar. 4, which were based on two discharge measurements and temperature records. No diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.			
1	132	99	95	70	60	650	2,850	370	142	2'6	97	332			
2	108	94					2,770	367	144	7 ⁰⁰ / ₂	113	416			
3	130	90					1,270	399	137	302	210	4,250			
4	116	101					920	373	130	2'6	250	8,600			
5	120	97	70	80	30	794	766	335	125	125	118	10,700			
6	120	101				727	676	287	120	116	118	8,950			
7	120	104				634	619	451	120	2'3	116	5,880			
8	116	104				607	562	448	118	171	99	2,470			
9	123	58	50	75	25	487	523	384	142	200	120	1,800			
10	116	54				196	481	337	135	152	90	1,440			
11	113	75				50	75	25	300	460	335	130	144	106	1,180
12	108								463	428	318	128	137	111	994
13	108		502	413	316				120	173	85	868			
14	101		460	387	289				113	125	83	759			
15	108	60	60	70	60	422	373	282	106	128	88	691			
16	104					362	348	253	101	132	83	682			
17	94					359	332	236	94	128	83	818			
18	99					396	332	228	90	123	83	836			
19	94	60	60	70	74	188	305	216	83	111	78	787			
20	92					329	295	200	78	101	76	688			
21	104					384	287	183	74	90	76	592			
22	104					381	263	183	76	113	263	505			
23	120	75	70	80	200	410	263	200	74	539	712	466			
24	113					463	261	183	69	377	920	419			
25	104					568	263	171	69	142	899	387			
26	104	85	65	70	500	721	248	171	62	176	613	365			
27	106					815	226	164	60	137	475	329			
28	99					1,280	223	168	56	132	327	318			
29	104					2,020	213	166	56	120	230	284			
30	99	101				2,420	253	149	54	116	173	266			
31	101					2,450		154		99	147				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	132	92	109	6,700
November	104		7 ⁰⁰ / ₂	4,710
December			68.2	4,190
January			74.2	4,560
February			12 ⁰⁰ / ₂	6,660
March	2,450	188	701	43,100
April	2,850	213	587	34,900
May	451	149	268	16,500
June	144	54	10 ⁰⁰ / ₂	5,950
July	762	90	18 ⁰⁰ / ₂	11,400
August	920	76	227	14,000
September	10,700	266	1,90 ⁰⁰ / ₂	113,000
The year	10,700		367	266,000

* Result of discharge measurement.

PLATTE RIVER BASIN

NORTH PLATTE RIVER NEAR NORTHGATE, COLO.

LOCATION.—Water-stage recorder in sec. 11, T. 11 N., R. 80 W., 6 miles south of Colorado-Wyoming line and 6 miles northwest of Northgate.

DRAINAGE AREA.—1,440 square miles.

RECORDS AVAILABLE.—May 1915 to September 1933.

DISCHARGE.—Maximum during year, 2,930 second-feet June 13 (gage height, 4.24 feet); minimum, 30 second-feet Feb. 18 (discharge measurement).

1915-33: Maximum, 6,720 second-feet June 11, 1923 (gage height, 6.24 feet); minimum, that of Feb. 18, 1933.

REMARKS.—Records good except those for Nov. 10 to Apr. 30, which were estimated on the basis of three discharge measurements and comparison with flow of North Platte River at Saratoga. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	107	145	145	58	40	65	300	908	1,300	454	266	110
2.....	102	184						881	1,520	369	364	94
3.....	94	184						856	1,880	312	337	89
4.....	92	200						821	1,970	283	288	80
5.....	97	191						781	1,890	292	248	75
6.....	99	191	85	54	33	95	250	813	2,090	292	225	68
7.....	94	184						838	2,400	270	221	63
8.....	94	184						624	2,530	322	229	63
9.....	102	184						562	2,210	385	244	70
10.....	123	188						516	1,880	374	218	82
11.....	145	177	50	50	30	130	195	473	2,140	322	200	115
12.....	154							413	2,460	297	184	207
13.....	157							369	2,810	266	163	237
14.....	154							413	2,830	237	145	200
15.....	145							454	2,780	240	137	175
16.....	140	180	60	45	30	125	200	491	2,860	252	128	145
17.....	140							510	2,700	244	128	134
18.....	137							542	2,580	233	126	123
19.....	140							689	2,670	221	134	112
20.....	154							788	2,850	214	154	117
21.....	154	170	60	42	40	125	300	890	2,500	229	157	115
22.....	166							1,070	2,050	221	145	117
23.....	178							1,180	1,850	233	137	120
24.....	175							1,040	1,690	240	126	115
25.....	175							873	1,400	214	112	112
26.....	172	155	60	42	45	185	900	711	1,160	204	110	123
27.....	166							659	990	184	120	210
28.....	184							719	813	175	157	225
29.....	188							804	682	169	172	204
30.....	184							873	582	172	163	194
31.....	181							1,050		184	134	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	188	92	142	8,730
November.....	200	145	172	10,200
December.....			76.1	4,680
January.....			48.3	2,970
February.....			35.7	1,980
March.....			123	7,560
April.....			358	21,300
May.....	1,180	369	729	44,800
June.....	2,860	582	2,000	119,000
July.....	454	169	262	16,100
August.....	364	110	183	11,300
September.....	237	63	130	7,740
The year.....	2,860		354	256,000

* Result of discharge measurement.

NORTH PLATTE RIVER AT SARATOGA, WYO.

LOCATION.—Water-stage recorder in sec. 14, T. 17 N., R. 84 W., at Saratoga. Zero of gage is 6,773.8 feet above mean sea level.

DRAINAGE AREA.—2,880 square miles.

RECORDS AVAILABLE.—June 1903 to October 1906; April to December 1909; April 1911 to September 1933.

DISCHARGE.—Maximum during year, 8,660 second-feet June 12 (gage height, 8.58 feet); minimum, 91 second-feet Apr. 18 (gage height, 3.21 feet).

1903-6, 1909, 1911-33: Maximum, 18,000 second-feet June 8, 1909 (gage height, 11.06 feet); minimum, 87 second-feet Sept. 7, 1924.

REMARKS.—Records good except those for periods Nov. 14-22, 24-26, Dec. 9 to Mar. 3, Mar. 22-23, which are estimated on the basis of two discharge measurements and temperature records. A few diversions between Northgate and Saratoga.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	236	400	374	162	147	212	760	2,030	6,090	1,640	350	249
2.....	240	386	356			258	830	1,780	7,100	1,420	496	229
3.....	244	428	386			302	958	1,740	7,200	1,270	599	211
4.....	244	386	312			344	1,050	1,730	7,270	1,150	545	197
5.....	244	321	307			302	830	1,770	7,410	1,070	464	184
6.....	253	386	302	158	131	344	770	1,870	7,460	1,010	414	181
7.....	253	386	270			356	750	1,760	7,530	1,060	380	178
8.....	261	362	155			368	682	1,650	7,220	1,200	374	178
9.....	380	356	140			380	617	1,380	6,840	1,130	380	211
10.....	449	400	132			393	635	1,270	7,130	1,040	393	232
11.....	407	297	136	152	125	393	581	1,140	7,750	914	350	225
12.....	449	338				407	563	1,070	8,110	810	326	362
13.....	480	386				488	504	1,000	7,770	730	307	456
14.....	504	400				464	449	925	7,750	645	278	435
15.....	480	370				528	407	936	7,510	581	261	380
16.....	435	375	153	150	141	572	400	1,000	7,170	563	240	362
17.....	407	380				464	160	1,120	7,270	545	232	338
18.....	414	380				414	120	1,430	6,930	488	229	297
19.....	428	380				368	142	1,910	6,770	472	244	270
20.....	362	410				407	218	2,490	6,530	464	265	249
21.....	435	380	159	144	149	386	386	3,110	6,040	414	265	236
22.....	520	360				380	780	3,770	5,330	414	270	232
23.....	536	338				375	1,000	3,330	4,900	428	253	240
24.....	496	340				368	1,100	2,840	4,530	428	236	249
25.....	393	340				512	1,230	2,660	3,880	414	222	249
26.....	386	350	162	143	160	407	1,550	2,700	3,290	386	218	257
27.....	414	374				374	1,810	3,180	2,800	344	260	297
28.....	428	368				504	1,910	3,840	2,440	326	326	362
29.....	414	338				750	2,190	4,200	2,140	326	338	374
30.....	456	344				626	2,370	4,780	1,870	316	321	356
31.....	407					750		5,450		321	297	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	536	236	389	23,900
November.....	428	297	369	22,000
December.....	386	132	192	11,800
January.....			151	9,280
February.....			140	7,780
March.....	750	212	426	26,200
April.....	2,370	120	858	51,100
May.....	5,450	925	2,250	138,000
June.....	8,110	1,870	6,060	361,000
July.....	1,640	316	720	44,300
August.....	599	218	327	20,100
September.....	456	178	276	16,400
The year.....	8,110	120	1,010	732,000

• Result of discharge measurement.

NORTH PLATTE RIVER ABOVE PATHFINDER RESERVOIR, WYO.

LOCATION.—Water-stage recorder in sec. 27, T. 26 N., R. 84 W., 900 feet below mouth of Lost Creek and 2½ miles above upper end of Pathfinder Reservoir.

DRAINAGE AREA.—7,410 square miles.

RECORDS AVAILABLE.—October 1913 to September 1925; June 1929 to September 1933.

DISCHARGE.—Maximum during year, 12,200 second-feet June 1st (gage height, 5.10 feet); minimum not determined, but probably occurred during winter.

1913–25, 1929–33: Maximum, 18,800 second-feet June 26, 1917 (gage height, 6.2 feet); minimum, 72 second-feet Nov. 14, 1922.

REMARKS.—Records excellent except those of discharge below 670 second-feet, which are good, and those estimated for periods Nov. 16, 21–24, Nov. 28 to Mar. 21, Aug. 21, which were based on comparison with flow of North Platte River at Saratoga. Diversions for irrigation above station.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	255	506	430	500	1, 070	4, 360	7, 480	2, 100	469	403
2.....	262	475	420		1, 050	3, 590	8, 570	1, 760	482	363
3.....	266	475	420		1, 090	2, 990	9, 860	1, 490	393	330
4.....	274	488	419		1, 140	2, 710	10, 400	1, 290	482	304
5.....	283	482	414		1, 210	2, 600	10, 700	1, 170	600	278
6.....	295	482	358	550	1, 190	2, 640	11, 100	1, 060	585	255
7.....	299	436	287		1, 100	2, 760	11, 100	1, 060	500	243
8.....	308	430	247		1, 050	2, 710	11, 300	1, 100	441	243
9.....	321	469	230		1, 120	2, 410	10, 900	1, 320	403	1, 030
10.....	340	446			1, 010	2, 080	10, 400	1, 210	383	820
11.....	519	430	230	700	840	1, 870	10, 800	1, 060	378	1, 180
12.....	500	393			742	1, 710	11, 300	960	398	850
13.....	469	424			800	1, 600	12, 000	830	383	555
14.....	469	452			704	1, 550	11, 600	742	358	475
15.....	475	419			668	1, 440	11, 600	676	344	548
16.....	463	420	260	850	676	1, 340	11, 400	617	317	532
17.....	436	424			780	1, 340	10, 700	742	299	469
18.....	430	446			1, 050	1, 480	10, 400	617	278	446
19.....	430	414			1, 420	1, 780	10, 200	642	278	398
20.....	436	463			1, 840	2, 380	9, 860	585	283	368
21.....	436	445	260	850	1, 580	3, 280	9, 400	513	283	335
22.....	398	420			1, 140	4, 160	8, 380	458	283	308
23.....	463	418			714	960	5, 170	7, 210	424	287
24.....	525	415			651	1, 300	4, 970	6, 350	408	287
25.....	555	414			642	1, 580	4, 780	5, 670	424	287
26.....	525	441	260	850	1, 840	4, 440	4, 780	424	761	278
27.....	488	424			642	2, 240	4, 070	3, 990	414	972
28.....	475	420			694	2, 620	4, 410	3, 360	398	562
29.....	500	450			790	2, 940	5, 140	2, 850	368	441
30.....	513	460			840	3, 820	5, 750	2, 470	368	436
31.....	494			938		6, 440		373	441	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	555	255	416	25,600
November.....	506	393	443	26,400
December.....	430		283	17,400
January.....			* 230	14,100
February.....			* 200	11,100
March.....	938		656	40,300
April.....	3,820	668	1,350	80,300
May.....	6,440	1,340	3,160	194,000
June.....	12,000	2,470	8,870	528,000
July.....	2,100	368	826	50,800
August.....	972	278	422	25,900
September.....	1,180	243	436	25,900
The year.....	12,000		1,440	1,040,000

* Estimated.

NORTH PLATTE RIVER BELOW PATHFINDER RESERVOIR, WYO.

LOCATION.—Water-stage recorder in sec. 24, T. 29 N., R. 84 W., $\frac{1}{4}$ quarter of a mile below Pathfinder Dam.

DRAINAGE AREA.—10,700 square miles.

RECORDS AVAILABLE.—May 1905 to September 1933.

DISCHARGE.—Since completion of reservoir, maximum, 18,900 second-feet June 25-27, 1917; no flow Nov. 23, 1928, Apr. 1 to May 19, 1932, Mar. 24 to Apr. 19, and Apr. 22 to June 2, 1933.

REMARKS.—Flow regulated by Pathfinder Reservoir, completed in June 1909, capacity, 1,070,000 acre-feet. Records furnished by United States Bureau of Reclamation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	June	July	Aug.	Sept.
1.....	590	80	50	50	50	30	0	0	6, 100	5, 380	3, 520
2.....	590	100	50	50	50	30	0	0	6, 090	5, 620	3, 500
3.....	540	100	50	50	50	30	0	830	6, 090	5, 850	5, 240
4.....	470	100	50	50	50	30	0	1, 550	6, 10 ^a	5, 860	5, 500
5.....	490	100	50	50	50	30	0	2, 540	6, 10 ^a	5, 330	5, 440
6.....	510	100	50	50	50	30	0	3, 460	6, 090	5, 040	4, 050
7.....	510	100	50	50	50	30	0	4, 340	6, 070	5, 030	3, 460
8.....	500	100	50	50	50	30	0	5, 280	6, 060	4, 940	3, 510
9.....	500	110	50	50	50	30	0	5, 420	6, 060	4, 970	3, 490
10.....	500	110	50	50	50	30	0	5, 420	6, 10 ^a	5, 000	3, 560
11.....	500	110	60	50	50	30	0	5, 420	6, 090	4, 980	3, 570
12.....	500	110	70	50	75	30	0	6, 070	6, 070	4, 980	3, 550
13.....	500	110	70	50	75	30	0	6, 060	5, 640	4, 940	3, 080
14.....	510	110	70	50	75	20	0	6, 040	5, 660	4, 960	2, 560
15.....	510	90	70	50	75	20	0	6, 040	5, 640	4, 980	2, 520
16.....	210	90	70	50	75	20	0	6, 410	5, 640	5, 030	1, 960
17.....	105	70	70	50	75	20	0	6, 460	5, 610	5, 030	1, 110
18.....	105	40	70	50	75	20	0	6, 490	5, 610	4, 970	1, 040
19.....	100	40	70	50	75	20	0	6, 730	5, 580	5, 120	1, 040
20.....	100	50	70	50	75	20	260	6, 930	5, 200	5, 130	1, 040
21.....	105	50	70	50	75	2	140	6, 930	5, 030	5, 080	1, 040
22.....	105	50	70	50	75	2	0	6, 930	5, 000	5, 050	1, 040
23.....	105	50	70	50	75	2	0	6, 950	5, 000	5, 020	1, 720
24.....	105	50	70	50	50	0	0	6, 860	4, 970	4, 820	2, 080
25.....	105	50	70	50	50	0	0	6, 950	5, 02 ^a	4, 720	1, 550
26.....	105	-50	70	50	50	0	0	6, 950	5, 000	4, 670	1, 980
27.....	105	50	50	50	50	0	0	6, 930	4, 980	4, 700	2, 020
28.....	105	50	50	50	40	0	0	6, 170	4, 970	4, 700	1, 220
29.....	105	50	50	50	-----	0	0	6, 120	5, 030	3, 630	600
30.....	95	50	50	50	-----	0	0	6, 100	5, 360	3, 550	600
31.....	40	-----	50	50	-----	0	-----	-----	5, 390	3, 550	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	590	40	204	18, 700
November.....	110	40	77. 3	4, 600
December.....	70	50	60	3, 690
January.....	50	50	50	3, 070
February.....	75	40	60. 4	3, 350
March.....	30	0	17. 3	1, 060
April.....	260	0	13. 3	791
June.....	6, 950	0	5, 200	314, 000
July.....	6, 100	4, 970	5, 590	344, 000
August.....	5, 860	3, 550	4, 520	302, 000
September.....	5, 500	600	2, 550	152, 000
The year.....	6, 950	0	1, 590	1, 150, 000

NOTE.—No flow during May.

NORTH PLATTE RIVER BELOW CASPER, WYO.

LOCATION.—Water-stage recorder in NW¼NW¼ sec. 4, T. 33 N., R. 78 W., 6½ miles east of Casper.

DRAINAGE AREA.—12,600 square miles.

RECORDS AVAILABLE.—October 1932 to September 1933. Comparable records May 1929 to September 1932 at site at Casper.

DISCHARGE.—Maximum during year, 7,080 second-feet (gage height, 5.48 feet); minimum, 26 second-feet Apr. 12 (gage height, 0.08 foot).

1929-33: Maximum, 13,800 second-feet May 30, 1929; minimum, that of Apr. 12, 1933.

REMARKS.—Records good except those for Dec. 1 to Apr. 21, which are estimated on the basis of three discharge measurements and temperature records, and those estimated Oct. 1-5, 21-24, Nov. 6-30, July 17, 18. Flow regulated by Pathfinder Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1.....	750	160			45	210	134	5,920	5,560	3,990
2.....	735	152			50	163	134	5,920	5,770	3,970
3.....	715	134			60	148	134	5,920	6,080	5,490
4.....	680	156	a 118		55	134	825	5,920	5,980	5,560
5.....	590	160			50	163	2,190	5,900	5,540	5,410
6.....	570	170			45	190	3,310	5,940	5,270	4,360
7.....	578	170			45	186	3,950	6,040	5,180	3,680
8.....	578	170			45	148	4,890	6,000	5,140	3,760
9.....	578	170			45	138	5,070	5,920	5,160	5,120
10.....	554	170			44	127	5,050	5,960	5,210	4,140
11.....	546	170			44	127	5,110	6,000	5,180	3,830
12.....	530	160			42	148	5,600	6,000	5,250	3,830
13.....	516	155			55	152	5,660	5,700	5,270	3,370
14.....	509	160		a 89	65	141	5,700	5,700	5,300	2,820
15.....	509	165			55	182	5,730	5,700	5,320	2,750
16.....	481	160			75	152	6,000	5,700	5,380	2,280
17.....	298	160			80	123	6,140	5,700	5,380	1,530
18.....	239	160			85	116	6,160	5,700	5,340	1,270
19.....	198	155			92	113	6,440	5,680	5,490	1,230
20.....	182	140			150	134	6,560	5,380	5,520	1,230
21.....	172	130			350	167	6,460	5,340	5,390	1,220
22.....	175	125			481	206	6,480	5,340	5,360	1,200
23.....	175	125			244	361	6,480	5,200	5,320	1,460
24.....	163	130			190	642	6,420	5,180	5,180	2,080
25.....	163	125			230	446	6,500	5,200	5,090	1,950
26.....	160	125			292	292	6,540	5,200	5,560	1,710
27.....	167	130			287	239	6,500	5,180	5,200	2,030
28.....	167	125			292	202	5,890	5,160	5,230	1,790
29.....	160	125			355	175	5,900	5,210	4,220	834
30.....	160	122			319	156	5,900	5,520	4,050	735
31.....	160					138		5,540	4,020	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	750	160	392	24,100
November.....	170	122	149	8,870
December.....			b 130	7,990
January.....			b 120	7,380
February.....			b 110	6,110
March.....			b 55	3,380
April.....	481	26	142	8,450
May.....	642	113	194	11,900
June.....	6,560	134	4,930	293,000
July.....	6,040	5,160	5,640	347,000
August.....	6,080	4,020	5,260	323,000
September.....	5,560	735	2,820	168,000
The year.....	6,560	26	1,670	1,210,000

a Result of discharge measurement.

b Estimated.

NORTH PLATTE RIVER AT DOUGLAS, WYO.

LOCATION.—Water-stage recorder in sec. 8, T. 32 N., R. 71 W., half a mile northwest of Douglas.

DRAINAGE AREA.—14,200 square miles.

RECORDS AVAILABLE.—May 1891 to September 1894; April 1919 to September 1923; April 1929 to September 1933.

DISCHARGE.—Maximum during year, 8,580 second-feet Aug. 28 (gage height, 6.12 feet); minimum not determined, occurred during winter.

1891-94, 1919-23, 1929-33: Maximum, 16,600 second-feet Sept. 28, 1923; minimum, 95 second-feet Apr. 1, 4, 1923.

REMARKS.—Records good except those estimated for Dec. 7 to Apr. 22, which were based on three discharge measurements and temperature records. Flow regulated by Pathfinder Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1	950	247	204			130	2,520	1,370	5,920	5,290	3,660
2	863	242	209			150	2,270	1,260	6,200	5,330	3,630
3	863	242	204			160	1,930	1,130	5,860	5,660	3,780
4	839	236	214	• 154		165	1,890	960	5,780	5,800	5,270
5	705	230	220			150	2,090	1,220	5,800	5,720	5,390
6	960	253	220			140	2,020	2,470	5,780	5,160	5,270
7	863	247				140	1,990	3,460	5,820	5,080	3,850
8	655	253	180			170	1,770	4,140	6,000	5,060	3,610
9	645	259				180	1,480	5,090	5,840	5,010	4,070
10	645	288				150	1,140	5,270	5,820	5,060	4,850
11	635	270				130	1,060	5,250	5,800	5,060	3,900
12	635	260				130	1,020	5,320	5,780	5,040	3,630
13	625	270	150			125	923	5,800	5,660	5,040	3,630
14	605	285				150	863	5,860	5,420	5,040	3,150
15	605	290			• 100	148	863	5,880	5,460	5,040	2,750
16	596	295				150	935	5,940	5,390	5,060	2,550
17	577	276				180	998	6,200	5,440	5,100	2,150
18	487	265	140			185	1,100	6,200	5,390	5,060	1,650
19	413	259				185	1,380	6,280	5,370	5,080	1,350
20	341	253				250	1,620	6,900	5,310	5,220	1,290
21	301	236				650	1,830	6,750	4,950	5,180	1,290
22	295	225				1,000	2,300	6,750	4,890	5,060	1,260
23	282	225	160			827	3,170	6,770	4,860	4,990	1,230
24	265	220				782	4,500	6,690	4,860	4,930	1,480
25	265	214				685	3,680	6,770	4,820	4,740	2,120
26	259	214				793	2,810	6,770	4,890	4,740	1,990
27	265	214				1,020	2,350	6,750	4,890	5,620	1,850
28	259	209	150			1,700	2,300	6,490	4,860	7,030	2,100
29	253	209				2,800	2,050	6,000	4,840	4,950	1,850
30	247	209				2,800	1,770	5,980	4,870	3,890	935
31	259						1,530		5,200	3,750	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	960	247	531	32,600
November	295	209	246	14,600
December	220		166	10,200
January			• 135	8,300
February			• 120	6,660
March			• 175	10,800
April	2,800	125	541	32,200
May	4,500	863	1,880	116,000
June	6,900	960	5,060	301,000
July	6,200	4,820	5,420	333,000
August	7,030	3,750	5,120	315,000
September	5,390	935	2,850	170,000
The year	7,030		1,860	1,350,000

• Result of discharge measurement.

• Estimated.

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.

LOCATION.—Water-stage recorder in sec. 35, T. 27 N., R. 66 W., three-quarters of a mile below Guernsey Dam and 1 mile northwest of Guernsey.

DRAINAGE AREA.—16,200 square miles.

RECORDS AVAILABLE.—June 1900 to November 1908; March to October 1912; January 1928 to September 1933.

REMARKS.—Flow regulated by Pathfinder and Guernsey Reservoirs. Only a few minor diversions for irrigation between this station and diversion dam at Whalen. Records furnished by United States Bureau of Reclamation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,060	501	346	221	190	190	237	3,210	3,040	6,150	5,300	4,450
2.....	1,100	375	341	190	211	190	247	3,290	3,220	6,230	5,250	4,430
3.....	1,100	346	318	242	190	226	211	3,620	3,330	6,420	5,250	4,410
4.....	1,060	346	330	221	232	232	269	3,630	3,490	6,500	5,190	4,390
5.....	1,030	341	237	211	242	211	232	4,030	3,910	6,680	5,120	4,430
6.....	1,010	313	346	221	165	190	237	3,810	4,490	6,290	5,100	4,500
7.....	979	247	307	170	253	291	237	3,990	4,710	5,800	5,100	4,620
8.....	931	307	404	211	352	232	221	3,640	5,000	5,670	5,030	4,600
9.....	899	296	381	165	264	258	195	2,960	4,930	5,900	5,030	4,560
10.....	907	291	352	232	253	242	170	2,270	5,290	5,520	5,080	4,520
11.....	907	258	330	165	221	221	195	2,320	5,290	5,520	5,080	4,500
12.....	907	269	232	195	206	216	216	2,180	5,580	5,520	5,080	4,350
13.....	907	285	352	200	211	190	211	2,080	5,650	5,520	5,080	3,860
14.....	907	216	318	155	206	211	226	1,860	5,720	5,650	5,120	3,600
15.....	899	274	274	190	237	237	190	1,670	5,980	5,540	5,120	3,440
16.....	907	268	211	185	221	237	212	1,560	6,100	5,600	5,120	3,170
17.....	915	258	221	247	200	216	175	1,560	6,150	5,410	5,120	2,970
18.....	915	285	237	247	175	190	416	2,020	6,260	5,430	5,120	2,960
19.....	891	307	195	274	200	200	551	1,600	6,360	5,380	5,050	2,890
20.....	845	280	258	253	116	226	703	2,050	6,520	5,190	5,050	2,850
21.....	830	247	216	221	242	274	716	2,170	6,520	5,230	5,050	2,810
22.....	830	318	237	190	165	285	830	3,170	6,390	5,250	5,050	2,750
23.....	830	291	237	160	175	269	868	3,750	6,340	5,230	5,050	2,600
24.....	838	296	212	200	140	280	898	6,670	6,150	5,250	5,050	2,510
25.....	830	242	195	185	109	274	898	7,300	5,950	5,190	5,010	2,480
26.....	830	307	150	195	126	232	883	6,210	5,900	5,190	5,010	2,450
27.....	822	307	190	206	122	175	921	4,770	6,000	5,210	5,030	2,370
28.....	815	247	226	221	221	291	945	2,990	6,180	5,250	4,940	2,000
29.....	815	313	226	253	-----	291	945	2,890	6,310	5,270	4,730	1,850
30.....	830	346	216	150	-----	264	1,910	2,890	6,360	5,300	4,560	1,600
31.....	830	-----	237	211	-----	232	-----	2,970	-----	5,300	4,430	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,100	815	910	56,000
November.....	501	216	299	17,800
December.....	404	150	269	16,500
January.....	274	150	206	12,700
February.....	352	109	202	11,200
March.....	291	175	235	14,400
April.....	1,910	170	506	30,100
May.....	7,300	1,560	3,200	197,000
June.....	6,520	3,040	5,440	324,000
July.....	6,680	5,190	5,600	344,000
August.....	5,300	4,430	5,040	310,000
September.....	4,620	1,600	3,430	204,000
The year.....	7,300	109	2,120	1,540,000

NORTH PLATTE RIVER BELOW WHALEN, WYO.

LOCATION.—In sec. 11, T. 26 N., R. 65 W., at diversion dam at Whalen, 7 miles below Guernsey Dam.

DRAINAGE AREA.—16,300 square miles.

RECORDS AVAILABLE.—May 1909 to September 1933.

DISCHARGE.—Average, 24 years (1909–33), 1,430 second-feet.

REMARKS.—Discharge records obtained by subtracting flow of Interstate and Fort Laramie Canals from flow below Guernsey Reservoir. Flow regulated by Pathfinder and Guernsey Reservoirs.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	450	215	58	26	90	112	2,340	1,220	2,630	1,640	1,370
2	96	271	210	30	51	127	122	2,170	1,320	2,700	1,630	1,360
3	91	242	187	81	46	176	86	2,390	1,230	2,850	1,630	1,350
4	70	242	199	53	64	207	141	2,370	1,170	2,940	1,570	1,290
5	17	237	87	47	78	135	107	2,760	1,400	3,180	1,580	1,240
6	26	182	196	38	29	95	97	2,530	1,650	2,790	1,610	1,180
7	25	116	157	26	174	201	97	2,720	1,650	2,290	1,620	1,270
8	25	176	248	51	175	196	81	2,440	1,970	2,160	1,540	1,250
9	25	165	200	27	91	208	55	1,840	1,970	2,390	1,510	1,200
10	25	160	184	58	80	168	30	1,150	2,270	1,990	1,530	1,200
11	25	127	149	29	57	151	55	1,220	2,260	1,980	1,520	1,190
12	25	138	67	47	58	141	76	1,120	2,500	1,980	1,520	1,110
13	25	158	183	20	51	108	71	1,040	2,510	1,980	1,480	944
14	25	85	145	23	62	124	88	829	2,510	2,070	1,490	862
15	25	143	104	48	47	150	50	621	2,620	1,930	1,600	781
16	25	137	51	52	48	142	72	624	2,670	1,980	1,520	640
17	25	127	67	99	14	110	35	692	2,650	1,810	1,500	587
18	25	154	85	87	18	93	20	1,160	2,710	1,860	1,500	606
19	25	176	26	117	23	113	25	619	2,810	1,830	1,440	581
20	25	149	95	85	16	130	80	878	2,950	1,630	1,440	577
21	25	116	42	49	61	174	62	960	2,960	1,710	1,450	599
22	25	187	71	28	15	185	27	1,940	2,910	1,720	1,450	580
23	25	177	62	16	15	169	27	2,820	3,000	1,690	1,450	532
24	25	188	52	52	15	173	37	5,600	2,960	1,680	1,450	476
25	25	134	43	29	19	169	35	6,170	2,830	1,600	1,410	449
26	25	199	22	43	26	119	24	5,260	2,800	1,590	1,420	438
27	25	199	26	53	22	72	41	3,480	2,860	1,600	1,440	460
28	25	128	53	83	109	166	43	1,560	2,860	1,610	1,850	144
29	25	182	67	20	-----	166	43	1,450	2,840	1,640	1,540	158
30	25	215	48	20	-----	139	1,010	1,380	2,840	1,610	1,410	133
31	505	-----	66	47	-----	112	-----	1,310	-----	1,600	1,350	-----
Month	Maximum					Minimum			Mean		Run-off in acre-feet	
October	505					17			46.8		2,880	
November	450					85			179		10,700	
December	248					22			110		6,760	
January	117					16			48.9		3,010	
February	175					14			53.2		2,950	
March	208					72			145		8,920	
April	1,010					20			95.0		5,650	
May	6,170					619			2,050		128,000	
June	3,000					1,170			2,360		140,000	
July	3,180					1,590			2,030		125,000	
August	1,850					1,350			1,520		93,500	
September	1,370					133			819		48,700	
The year	6,170					14			793		574,000	

NORTH PLATTE RIVER AT TORRINGTON, WYO.

LOCATION.—Water-stage recorder in sec. 15, T. 24 N., R. 61 W. at Torrington.
DRAINAGE AREA.—21,700 square miles.

RECORDS AVAILABLE.—April 1930 to September 1933. Records for April 1926 to September 1930 published by State engineer of Nebraska.

DISCHARGE.—Maximum during year, 6,740 second-feet May 24 (gage height, 3.14 feet); minimum, 228 second-feet Feb. 7 (discharge measurement).

1926-33: Maximum, 14,200 second-feet June 2, 1929; minimum, 226 second-feet Mar. 9, 1932 (discharge measurement).

REMARKS.—Records good except those estimated for Nov. 6 to Feb. 25 on basis of seven discharge measurements and temperature records. Small diversions for irrigation above station. Flow regulated by Pathfinder and Guernsey Reservoirs.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	718	635	560	390	440	502	407	2,180	1,590	2,660	1,590	1,650
2.....	622	689	535			502	389	2,180	1,540	2,640	1,680	1,650
3.....	560	635	548			502	398	2,520	1,500	2,910	1,740	1,650
4.....	524	635	560			560	380	2,660	1,430	3,270	1,720	1,630
5.....	491	622	585			535	380	3,150	1,460	3,390	1,740	1,500
6.....	458	635	524	435	300	524	371	3,320	1,520	3,060	1,680	1,390
7.....	458	610	470			502	371	3,440	1,700	2,570	1,650	1,460
8.....	447	585	410			535	362	3,250	1,870	2,410	1,590	1,410
9.....	447	598	350			502	380	2,680	2,030	2,520	1,520	1,480
10.....	425	572	280			524	371	2,120	2,250	2,200	1,520	1,480
11.....	425	635	370	440	375	480	362	1,920	2,360	2,030	1,540	1,500
12.....	416	535				480	362	1,830	2,480	1,980	1,590	1,460
13.....	398	572				480	353	1,720	2,480	1,960	1,570	1,370
14.....	389	560				469	380	1,520	2,430	1,980	1,610	1,370
15.....	380	585				469	398	1,210	2,340	1,920	1,610	1,350
16.....	389	585	560	455	420	458	362	1,150	2,270	1,900	1,610	1,280
17.....	371	585				447	380	1,170	2,270	1,940	1,610	1,190
18.....	389	598				458	335	1,460	2,360	1,870	1,630	1,170
19.....	425	622				447	290	1,300	2,480	1,830	1,540	1,130
20.....	398	610				436	362	1,210	2,780	1,650	1,520	1,050
21.....	398	572	490	450	475	447	436	1,460	2,890	1,650	1,520	1,050
22.....	398	585				480	316	1,980	2,980	1,760	1,520	1,050
23.....	407	585				469	276	3,320	3,080	1,650	1,480	1,030
24.....	398	560				469	276	5,720	3,200	1,650	1,480	1,010
25.....	398	560				458	398	6,620	3,100	1,610	1,480	994
26.....	407	535	480	425	436	447	436	5,580	3,030	1,590	1,480	1,010
27.....	398	535				447	436	4,220	3,030	1,590	1,570	994
28.....	407	548				407	502	2,730	3,010	1,700	2,800	907
29.....	389	548				416	622	2,270	2,840	1,740	1,980	873
30.....	398	560				407	1,130	2,010	2,710	1,680	1,900	890
31.....	407	-----	370	-----	-----	398	-----	1,790	-----	1,610	1,760	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	718	371	437	26,900
November.....	689	535	590	35,100
December.....	-----	-----	469	28,800
January.....	-----	-----	428	26,300
February.....	-----	228	406	22,500
March.....	560	398	472	29,000
April.....	1,130	276	409	24,300
May.....	6,620	1,150	2,570	158,000
June.....	3,200	1,430	2,370	141,000
July.....	3,390	1,590	2,090	129,000
August.....	2,800	1,480	1,650	101,000
September.....	1,650	873	1,270	75,600
The year.....	6,620	228	1,100	798,000

* Result of discharge measurement.

NORTH PLATTE RIVER AT WYOMING-NEBRASKA LINE

LOCATION.—Water-stage recorder in sec. 10, T. 23 N., R. 60 W., a quarter of a mile above Wyoming-Nebraska line and 1 mile southwest of Henry, Nebr.

DRAINAGE AREA.—22,100 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 6,980 second-feet May 24 (gage height, 4.03 feet); minimum, 236 second-feet Apr. 24 (gage height, 0.62 foot).

1929-33: Maximum, 17,900 second-feet June 2, 1929 (gage height, 6.04 feet); minimum, 209 second-feet Mar. 27, 1931.

REMARKS.—Records good except those estimated for Dec. 6 to Jan. 12, Jan. 18-22, Feb. 1-3, 5-15, 18-25, which were based on two discharge measurements and temperature records, and those estimated Oct. 18-21, 24-29, Oct. 31 to Nov. 4. Large diversions for irrigation between Torrington and this station. Flow regulated by Pathfinder and Guernsey Reservoirs.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	722	654	631	450	480	511	440	2,030	1,550	2,520	1,500	1,570
2	556	699	606			474	440	2,460	1,500	2,440	1,570	1,550
3	503	640	623			468	454	2,570	1,430	2,590	1,570	1,550
4	503	633	623			468	556	447	2,720	1,270	2,820	1,640
5	488	694	640			549	434	2,980	1,270	2,930	1,640	1,430
6	461	722	549	500	350	541	427	3,340	1,330	2,900	1,550	1,280
7	549	703	500			503	427	3,400	1,470	2,440	1,550	1,320
8	581	623	440			572	420	3,420	1,630	2,330	1,500	1,330
9	549	676	360			564	427	2,950	1,660	2,420	1,450	1,360
10	534	666	300			556	414	2,440	1,790	2,210	1,470	1,380
11	534	614		510	400	541	402	2,090	1,930	2,010	1,470	1,400
12	503	606		510		526	408	1,890	2,050	1,930	1,500	1,470
13	488	631	400	511		526	396	1,870	2,110	1,910	1,470	1,450
14	474	598		526		518	360	1,760	2,130	1,890	1,480	1,320
15	474	549		511		488	384	1,500	2,190	1,810	1,430	1,270
16	461	589	590	511	440	503	360	1,350	2,250	1,830	1,380	1,180
17	488	589		468	449	518	366	1,320	2,230	1,890	1,420	1,110
18	491	598		490	450	503	334	1,500	2,290	1,830	1,420	1,080
19	521	657		505		481	292	1,480	2,350	1,790	1,430	1,070
20	488	648		515		468	830	1,220	2,520	1,660	1,400	1,010
21	482	589	520	520	500	474	623	1,400	2,770	1,610	1,400	1,000
22	474	598		505		526	427	1,700	2,840	1,630	1,400	975
23	488	614		481		518	355	3,600	2,930	1,610	1,360	923
24	470	623		461		496	262	5,410	2,910	1,550	1,400	862
25	462	598		454		511	296	6,730	2,660	1,540	1,360	826
26	463	556	500	447	454	511	396	5,720	2,660	1,500	1,430	826
27	455	541		434	468	503	447	4,400	2,630	1,480	1,480	850
28	429	526		468	454	434	454	2,980	2,630	1,480	2,480	850
29	425	564		488	480	440	474	2,230	2,660	1,540	1,990	746
30	434	623	365	481		481	800	1,930	2,610	1,480	1,760	702
31	437		400	480		461		1,740		1,500	1,680	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	722	425	496	30,500
November	722	526	621	37,000
December	640	300	503	30,900
January	526	434	485	29,800
February			437	24,300
March	572	434	507	31,200
April	830	262	433	25,800
May	6,730	1,220	2,650	163,000
June	2,930	1,270	2,140	127,000
July	2,930	1,480	1,970	121,000
August	1,360	1,360	1,530	94,100
September	1,570	702	1,170	69,600
The year	6,730	262	1,080	784,000

NORTH PLATTE RIVER AT MITCHELL, NEBR.

LOCATION.—Water-stage recorder in sec. 27, T. 23 N., R. 56 W., half a mile south of Mitchell.

DRAINAGE AREA.—24,300 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. June 1901 to July 1913 at station near Mitchell. Records April 1916 to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, 5,990 second-feet May 25 (gauge height, 3.25 feet); minimum, 363 second-feet Aug. 17 (gauge height, 0.66 foot).

1901–13, 1916–33: Maximum, 23,600 second-feet June 17, 1921; minimum, 185 second-feet Oct. 3, 4, 1932 (gauge height, 0.58 foot).

REMARKS.—Records good except those estimated for Dec. 6 to Jan. 13, Jan. 17–23, Feb. 6–25, and Mar. 4–9, which were based on three discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder and Guernsey Reservoirs.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	1,480	695	845	770	770	740	606	1,150	935	1,220	457	832	
2.....	1,290	968	785		785	770	606	2,230	748	1,150	490	790	
3.....	1,060	1,060	770		770	770	620	2,330	670	1,110	501	804	
4.....	936	1,020	755		770	750	620	2,267	536	1,270	582	762	
5.....	875	1,000	875		740	750	635	2,940	478	1,410	776	644	
6.....	860	952	830	800	600	740	635	3,480	457	1,520	720	536	
7.....	890	936	650		520	760	635	3,600	446	1,380	657	490	
8.....	890	920			442	780	650	3,540	425	1,150	607	490	
9.....	936	984			450	780	650	3,120	513	1,110	559	446	
10.....	890	1,080			475	785	635	2,720	571	1,040	478	467	
11.....	952	1,030	700	780	575	755	620	2,470	682	935	436	548	
12.....	936	1,050				740	606	2,350	748	875	446	818	
13.....	920	1,020				695	592	2,230	890	860	446	1,090	
14.....	905	875				740	665	578	2,080	875	832	436	1,150
15.....	845	830				725	635	578	1,770	905	762	425	1,150
16.....	830	920	780	770	700	665	564	1,540	920	707	383	1,140	
17.....	815	952	822	725	749	710	536	1,430	875	720	372	1,220	
18.....	830	936	830	760	700	695	508	1,310	875	695	393	1,140	
19.....	860	905			700	635	456	1,390	950	594	404	1,070	
20.....	800	920			680	620	905	1,120	1,110	559	404	935	
21.....	740	860			740	635	1,460	1,110	1,590	513	393	875	
22.....	725	830			800	665	968	1,240	1,610	524	404	790	
23.....	770	830	850	710	820	665	845	2,580	1,810	571	414	720	
24.....	770	920			780	695	710	3,830	1,950	548	404	695	
25.....	770	920			710	740	680	536	5,920	1,920	524	425	682
26.....	815	875			710	800	695	480	5,440	1,740	467	457	720
27.....	800	890	800	710	770	725	522	4,150	1,570	446	548	790	
28.....	815	845		695	755	695	564	2,840	1,520	425	920	875	
29.....	800	860		710	665	592	1,880	1,430	446	1,740	950		
30.....	785	890		710	650	620	1,480	1,310	425	1,070	995		
31.....	695			679	725	620		1,170		414	980		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,480	695	880	54,100
November.....	1,080	695	926	55,100
December.....	875	695	774	47,600
January.....	820	442	636	46,400
February.....	785	620	704	37,500
March.....	1,460	456	651	43,300
April.....	5,920	1,110	2,490	38,700
May.....	1,950	425	1,040	153,000
June.....	1,520	414	813	61,900
July.....	1,740	372	572	50,000
August.....	1,220	446	820	35,200
September.....	1,220	446	820	48,800
The year.....	5,920	372	927	672,000

NORTH PLATTE RIVER NEAR MINATARE, NEBR.

LOCATION.—Water-stage recorder on west line sec. 18, T. 21 N., R. 53 W., 2 miles south of Minatare.

DRAINAGE AREA.—24,700 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records May 1916 to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, 6,370 second-feet May 25 (gage height, 3.02 feet); minimum, 454 second-feet June 8 (gage height, 0.56 foot).

1930-33: Maximum, that of May 25, 1933; minimum, 142 second-feet May 27, 1931 (gage height, 0.60 foot).

Maximum stage since 1916 occurred in June 1921; discharge not determined.

REMARKS.—Records good except those for Nov. 6 to Mar. 7, which were based on six discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder and Guernsey Reservoirs.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,660	1,330	1,370	1,200	1,000	850	836	1,170	1,420	1,080	572	1,400
2	1,870	1,440	1,370				890	1,920	1,080	1,080	640	1,290
3	1,700	1,520	1,410				926	2,590	924	1,100	664	1,250
4	1,680	1,460	1,440				962	2,880	807	1,340	753	1,180
5	1,590	1,410	1,500				800	944	3,120	640	1,070	1,050
6	1,460	1,310	1,480	1,220	950	850	1,040	3,690	510	1,080	878	848
7	1,370	1,390			850	900	1,040	4,140	572	1,710	807	688
8	1,390	1,440			750	1,020	980	3,900	510	1,060	753	652
9	1,330	1,410	850		649	1,060	980	3,720	490	1,230	726	652
10	1,270	1,370			660	1,080	999	3,520	531	1,250	652	766
11	1,330	1,270		1,250	700	1,090	944	3,260	664	1,030	616	970
12	1,390	1,370				1,130	908	2,960	794	1,039	541	1,440
13	1,370	1,390	800			1,150	818	2,780	939	803	531	1,790
14	1,270	1,050				1,130	836	2,680	1,080	821	531	1,810
15	1,110	1,000				1,060	732	2,350	894	924	531	1,810
16	1,170	1,290		1,150	800	999	698	2,150	878	878	521	1,900
17	1,110	1,310				1,040	698	2,040	834	970	500	1,980
18	1,080	1,250	1,000			1,060	681	1,900	807	924	510	1,960
19	1,150	1,210				1,090	681	1,770	939	821	531	1,860
20	1,230	1,170				1,110	1,060	1,530	1,110	753	561	1,690
21	1,250	1,230	1,180	1,050	950	1,060	1,940	1,570	1,450	700	541	1,510
22	1,210	1,270				999	1,370	1,650	1,650	664	541	1,490
23	1,250	1,250				962	1,150	2,220	1,730	700	541	1,490
24	1,170	1,250	1,180			980	1,020	3,930	1,880	753	541	1,420
25	1,150	1,290				962	872	5,580	1,980	726	541	1,290
26	1,170	1,270		950	870	962	854	6,020	1,790	652	894	1,320
27	1,250	1,290				962	818	5,070	1,650	500	954	1,470
28	1,290	1,330				944	872	3,930	1,510	572	1,100	1,490
29	1,290	1,290	1,200			908	890	2,750	1,360	531	1,980	1,470
30	1,390	1,310				836	836	2,190	1,230	541	1,810	1,440
31	1,370					818		1,790		531	1,590	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,870	1,080	1,330	81,800
November	1,520	1,000	1,310	78,000
December			1,100	67,600
January			1,130	69,500
February			861	47,800
March	1,150	800	979	60,200
April	1,940	681	942	56,100
May	6,020	1,170	2,930	180,000
June	1,980	490	1,090	64,900
July	1,980	531	957	58,800
August	1,980	500	763	46,900
September	1,980	652	1,380	82,100
The year	6,020	490	1,230	894,000

NORTH PLATTE RIVER AT BRIDGEPORT, NEBR.

LOCATION.—Water-stage recorder in sec. 28, T. 20 N., R. 50 W., half a mile north of Bridgeport.

DRAINAGE AREA.—25,300 square miles.

RECORDS AVAILABLE.—May 1902 to November 1906; June to September 1915; October 1930 to Sept. 30, 1933. Records October 1915 to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, 6,570 second-feet May 26, 27 (gage height, 7.35 feet); minimum, 530 second-feet June 9 (gage height, 5.20 feet).

1902-6, 1915-33: Maximum, 23,000 second-feet June 19, 1921; minimum not determined.

REMARKS.—Records good except those for Nov. 11 to Mar. 8, which were based on seven discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder and Guernsey Reservoirs.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,880	1,630	1,660	1,600	1,380	1,150	1,230	1,270	1,810	1,210	718	2,420
2.....	2,150	1,660	1,660				1,250	1,570	1,460	1,110	862	2,220
3.....	2,310	1,780	1,660				1,230	2,490	1,230	1,150	918	2,010
4.....	2,050	1,850	1,660				1,230	3,120	1,010	1,270	899	1,990
5.....	1,950	1,630	1,600				1,080	3,370	862	1,880	956	1,790
6.....	1,920	1,680	1,550	1,610	1,250	1,200	1,020	3,550	666	2,220	1,150	1,550
7.....	1,920	1,730	1,120		1,080	1,250	1,020	4,180	666	2,170	1,170	1,330
8.....	1,920	1,780	1,050		900	1,320	1,020	4,360	683	1,940	1,090	1,170
9.....	1,900	1,780	1,000		700	1,430	1,020	4,250	615	1,610	956	1,070
10.....	1,880	1,780	971	1,620	718	1,430	1,020	3,940	615	1,550	880	1,170
11.....	1,920	1,560	1,200	1,650	900	1,500	1,000	3,740	615	1,380	754	1,550
12.....	1,920	1,660				1,500	1,000	3,320	632	1,110	649	1,970
13.....	1,900	1,680				1,470	1,000	3,090	683	975	718	2,270
14.....	1,880	1,730				1,470	1,000	2,980	808	918	718	2,540
15.....	1,730	1,780				1,520	980	2,800	880	1,110	683	2,620
16.....	1,680	1,850	1,300	1,550	1,150	1,500	960	2,520	826	1,090	666	2,540
17.....	1,730	1,850				1,500	923	2,250	808	1,030	649	2,590
18.....	1,730	1,800				1,470	942	2,080	790	1,110	615	2,590
19.....	1,730	1,780				1,430	942	1,920	790	1,010	615	2,440
20.....	1,710	1,780				1,430	1,140	2,040	918	880	649	2,420
21.....	1,710	1,780	1,450	1,400	1,250	1,380	1,750	1,810	1,330	736	649	2,340
22.....	1,710	1,780				1,380	2,150	1,700	1,610	700	683	2,270
23.....	1,710	1,680				1,380	1,780	1,970	1,660	790	718	2,150
24.....	1,680	1,590	1,460			1,310	1,500	3,040	1,810	844	700	2,100
25.....	1,690	1,560	1,500			1,310	1,270	4,580	1,940	862	1,070	2,080
26.....	1,660	1,540	1,600	1,350	1,150	1,270	1,200	6,570	2,060	862	2,220	2,290
27.....	1,660	1,520				1,270	1,200	6,130	1,940	790	1,940	2,250
28.....	1,660	1,590				1,250	1,230	4,920	1,770	649	2,100	2,290
29.....	1,540	1,610				1,250	1,270	3,680	1,550	615	2,420	2,320
30.....	1,500	1,630				1,230	1,340	2,590	1,350	547	3,060	2,420
31.....	1,540					1,230		2,080		632	2,590	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2,310	1,500	1,800	111,000
November.....	1,850	1,520	1,700	101,000
December.....	1,660	971	1,400	86,100
January.....		1,310	1,520	93,500
February.....		700	1,120	62,200
March.....	1,520		1,340	82,400
April.....	2,150	923	1,190	70,800
May.....	6,570	1,270	3,160	194,000
June.....	2,060	615	1,150	68,400
July.....	2,220	547	1,100	68,900
August.....	3,060	615	1,110	68,200
September.....	2,620	1,070	2,090	124,000
The year.....	6,570	547	1,560	1,130,000

* Result of discharge measurement.

NORTH PLATTE RIVER AT LISCO, NEBR.

LOCATION.—Water-stage recorder in sec. 33, T. 18 N., R. 46 W., half a mile south of Lisco.

DRAINAGE AREA.—26,900 square miles.

RECORDS AVAILABLE.—September 1931 to September 1933.

DISCHARGE.—Maximum during year, 8,150 second-feet May 26 (gage height, 3.13 feet); minimum, 279 second-feet July 29 (gage height, 0.88 foot).

1931-33: Maximum and minimum, those of 1933.

REMARKS.—Records good except those for period of ice effect, Nov. 6 to Mar. 10, which were based on six discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,490	1,820	1,760				1,340	1,430	2,040	1,030	587	2,620
2	1,620	1,820	1,760				1,320	1,500	1,760	1,010	660	2,300
3	2,020	1,900	1,760	1,800	1,400	1,650	1,210	1,980	1,480	1,030	720	2,100
4	2,140	2,020	1,700				1,230	3,390	1,360	1,240	780	2,000
5	2,020	2,100	1,720				1,110	3,660	1,180	1,360	765	1,910
6	2,000	2,060	1,700				1,140	3,820	1,080	1,730	919	1,800
7	2,060	2,140					1,190	4,150	919	2,000	950	1,620
8	2,100	2,100		1,900	1,000	1,600	1,230	4,660	760	1,890	998	1,440
9	2,060	2,000	1,250				1,250	4,620	610	1,640	982	1,340
10	2,040	2,040					1,160	4,700	472	1,480	888	1,310
11	2,040	1,980		1,950	780	1,550	1,160	4,480	558	1,360	765	1,440
12	2,020	1,900				1,530	1,160	4,150	810	1,080	690	1,980
13	2,020	1,960	1,300	2,000	1,100	1,570	1,180	3,620	810	810	902	2,200
14	2,080	1,940				1,530	1,120	3,280	795	765	587	2,400
15	1,980	1,920				1,470	1,040	3,200	919	826	572	2,850
16	1,820	1,960				1,430	1,040	3,020	857	1,010	544	2,880
17	1,880	1,880				1,380	1,020	2,690	705	1,060	500	2,720
18	1,880	1,900	1,400	1,850	1,600	1,400	1,060	2,420	765	1,030	486	2,920
19	1,940	1,940				1,250	1,090	2,220	780	904	458	2,920
20	1,900	1,940				1,280	1,820	2,100	1,010	735	472	2,590
21	1,900	1,880				1,250	2,310	2,140	1,050	602	544	2,530
22	2,120	1,880				1,400	2,570	1,870	1,340	587	660	2,470
23	2,120	1,840	1,530	1,750	1,960	1,430	2,490	2,390	1,600	660	660	2,300
24	2,060	1,820				1,400	1,880	2,590	1,640	645	587	2,220
25	2,000	1,860				1,230	1,570	4,440	1,710	765	630	2,200
26	2,020	1,820		1,550		1,280	1,470	6,480	1,820	765	1,730	2,470
27	2,000	1,800		1,460	1,720	1,320	1,470	7,750	1,760	675	2,590	2,390
28	2,020	1,780				1,340	1,340	6,820	1,580	529	2,590	2,330
29	1,900	1,780	1,650			1,380	1,320	5,230	1,360	388	2,390	2,240
30	1,900	1,800		1,500		1,360	1,380	3,700	1,190	374	2,560	2,330
31	1,840					1,300		2,560		444	3,350	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,140	1,490	1,970	121,000
November	2,140	1,780	1,920	114,000
December			1,500	92,200
January			1,790	110,000
February		780	1,430	79,400
March		1,230	1,460	89,800
April	2,570	1,020	1,890	82,700
May	7,750	1,430	3,580	220,000
June	2,040	472	1,160	69,000
July	2,000	374	981	60,300
August	3,350	458	1,040	64,000
September	2,920	1,310	2,230	133,000
The year	7,750	374	1,710	1,240,000

* Result of discharge measurement.

NORTH PLATTE RIVER AT OSHKOSH, NEBR.

LOCATION.—Water-stage recorder on west line sec. 2, T. 16 N., R. 44 W., 1 mile south of Oshkosh. Prior to Apr. 23, 1933, staff gage at same site. Gage datum not changed.

DRAINAGE AREA.—27,500 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records April 1916 to October 1917 and March 1928 to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, 6,370 second-feet May 27 (gage height, 3.25 feet); minimum, 270 second-feet July 31 (gage height, 0.99 foot).

1916-17, 1928-33: Maximum, 19,200 second-feet June 4, 1929; minimum, 253 second-feet July 21, 1931 (gage height, 1.12 feet).

REMARKS.—Records fair except those for period of ice effect, Dec. 6 to Mar. 3, which were based on three discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,320	2,000	1,910	1,850	1,700	2,200	1,300	1,850	2,470	1,010	412	3,480
2.....	1,380	1,910	1,960				1,260	1,800	2,250	890	512	2,700
3.....	1,980	1,960	2,000				1,240	2,200	1,780	722	540	2,540
4.....	2,320	2,030	2,000				2,100	1,240	3,270	1,490	991	626
5.....	2,280	2,120	1,960				880	1,240	3,840	1,360	1,140	642
6.....	2,100	2,120	1,860	2,000	1,100	1,550	1,340	3,950	1,180	1,470	674	1,920
7.....	2,000	2,100	1,360	2,270		2,380	1,320	4,140	1,080	1,800	754	1,830
8.....	2,000	1,910				3,140	1,320	4,620	770	2,060	991	1,600
9.....	1,980	1,960	1,260	2,150		2,650	1,220	4,740	658	1,900	950	1,420
10.....	1,880	1,960				1,880	1,170	4,860	610	1,600	850	1,330
11.....	1,980	1,860	1,320	2,100	930	1,810	1,150	4,680	512	1,510	706	1,380
12.....	1,880	1,860			950	1,810	1,080	4,310	626	1,270	596	1,740
13.....	1,910	1,930			973	1,810	1,130	3,950	674	1,050	526	2,060
14.....	1,960	1,950			1,200	1,810	1,200	3,540	582	810	458	2,300
15.....	1,980	1,900			1,400	1,810	1,200	3,350	610	830	390	2,600
16.....	2,180	2,050	1,430	2,000	1,850	1,740	1,200	3,170	610	870	401	2,780
17.....	2,050	2,100				1,720	1,180	2,910	526	870	378	2,800
18.....	2,100	2,030				1,680	1,280	2,700	498	810	378	2,880
19.....	1,980	2,030				1,680	1,630	2,500	568	754	401	2,960
20.....	1,960	1,910				1,630	1,980	2,520	754	626	458	3,010
21.....	2,050	1,880	1,550	1,850	2,150	1,650	2,480	2,540	810	540	470	3,040
22.....	2,400	1,810				1,720	2,900	2,440	950	568	526	2,990
23.....	2,480	1,910				1,720	3,300	2,650	1,220	568	554	2,960
24.....	2,280	1,930				1,650	2,700	2,910	1,530	610	610	3,090
25.....	2,200	1,960				1,590	2,130	3,250	1,470	738	610	2,700
26.....	2,180	1,880	1,700	1,600	2,100	1,500	1,900	4,680	1,600	790	1,420	2,650
27.....	2,100	1,860		1,550		1,420	1,850	6,130	1,740	658	2,650	2,700
28.....	2,080	1,960		1,530		1,460	1,900	5,860	1,620	498	3,300	2,700
29.....	2,050	1,960				1,480	1,830	5,090	1,420	321	2,540	2,620
30.....	2,050	1,860		1,750		1,460	1,800	4,060	1,200	287	2,780	2,600
31.....	2,050					1,360		3,140		312	3,300	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2,480	1,320	2,040	125,000
November.....	2,120	1,810	1,960	117,000
December.....	2,000		1,570	96,500
January.....	2,270	1,530	1,920	118,000
February.....		930	1,630	90,500
March.....	3,140	880	1,800	111,000
April.....	3,300	1,080	1,620	96,400
May.....	6,130	1,800	3,600	221,000
June.....	2,470	498	1,110	66,000
July.....	2,060	287	931	57,200
August.....	3,300	378	981	60,300
September.....	3,480	1,330	2,450	146,000
The year.....	6,130	287	1,800	1,300,000

• Result of discharge measurement.

NORTH PLATTE RIVER AT NORTH PLATTE, NEBR.

LOCATION.—Water-stage recorder in sec. 28, T. 14 N., R. 30 W., half a mile north of North Platte and 4½ miles above mouth of South Platte River.

DRAINAGE AREA.—32,000 square miles.

RECORDS AVAILABLE.—February 1895 to September 1915; October 1930 to September 1933. Records October 1915 to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, 9,980 second-feet May 29 (gage height, 4.50 feet); minimum, 314 second-feet July 31, Aug. 1 (gage height, 2.40 feet).

1895-1933: Maximum, 27,100 second-feet June 6, 1909; minimum, 20 second-feet Sept. 20, 1904.

REMARKS.—Records good except those for period of ice effect, Nov. 8 to Mar. 5, which were based on four discharge measurements and temperature records, and those estimated Apr. 20-26. Numerous diversions for irrigation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.7	Aug.	Sept.	
1.....	1,580	2,590	2,520	2,550	2,700	2,800	2,240	2,170	4,660	1,110	612	3,120	
2.....	1,510	2,520	2,520				2,140	1,950	3,660	1,070	767	3,250	
3.....	1,480	2,620	2,520				1,920	2,300	2,480	884	612	3,750	
4.....	1,600	2,620	2,480				1,810	2,850	2,140	767	633	3,000	
5.....	1,840	2,660	2,520				1,680	3,120	1,840	668	622	2,740	
6.....	2,550	2,620	2,140	2,700	1,800	907	1,600	3,880	1,530	675	842	3,170	
7.....	2,850	2,660	1,810			1,270	1,630	5,250	1,380	1,060	995	2,200	
8.....	2,740	2,740	1,500			1,440	1,650	4,660	1,700	1,040	950	2,170	
9.....	2,590	2,590				1,600	1,650	5,560	1,400	1,200	920	1,980	
10.....	2,620	2,340				2,800	1,600	6,240	1,010	1,330	950	1,680	
11.....	2,660	2,200	1,550	2,850	950	3,000	1,510	7,160	816	1,920	980	1,560	
12.....	2,620	2,590				3,330	1,560	6,620	868	1,460	950	2,270	
13.....	2,550	2,410				2,770	1,510	6,320	767	1,040	920	2,930	
14.....	2,550	2,480				2,440	1,560	5,440	686	920	907	3,000	
15.....	2,550	2,410				2,440	1,600	4,830	633	776	855	2,770	
16.....	2,590	2,520	1,650	2,750	1,400	2,370	1,630	4,490	612	674	1,010	2,850	
17.....	2,590	2,440				2,270	1,580	4,230	522	602	829	3,040	
18.....	2,590	2,590				2,140	1,460	3,980	432	560	721	3,290	
19.....	2,550	2,700				1,780	1,380	3,790	390	504	664	3,250	
20.....	2,370	2,620				2,200	2,100	3,440	432	494	644	3,120	
21.....	2,440	2,620	2,300	2,450	2,500	2,170	3,200	3,040	375	407	664	3,170	
22.....	2,410	2,700				2,080	5,200	2,930	375	602	855	3,170	
23.....	2,930	2,700				2,240	5,800	2,960	441	767	855	3,120	
24.....	2,890	2,700				2,410	4,700	2,620	504	770	920	3,000	
25.....	3,040	2,590				2,340	4,000	2,110	544	675	1,180	2,890	
26.....	3,080	2,550	2,500	2,570	2,800	2,240	3,800	2,930	744	676	950	2,810	
27.....	2,770	2,590				2,200	3,440	3,290	995	632	1,140	2,590	
28.....	2,660	2,550				2,240	2,740	4,600	995	571	1,810	2,410	
29.....	2,700	2,590				2,500	2,370	2,110	9,980	1,120	466	5,130	2,620
30.....	2,590	2,590					2,340	2,110	8,050	1,250	390	5,900	2,520
31.....	2,620					2,340		7,400		379	3,530		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3,080	1,480	2,490	153,000
November.....	2,740	2,200	2,570	153,000
December.....			2,050	126,000
January.....			2,660	164,000
February.....			1,960	109,000
March.....	3,330	907	2,310	142,000
April.....	5,800	1,380	2,360	140,000
May.....	9,980	1,950	4,460	274,000
June.....	4,660	375	1,180	70,200
July.....	1,920	329	804	49,400
August.....	5,900	612	1,270	78,100
September.....	3,750	1,560	2,780	165,000
The year.....	9,980	329	2,240	1,620,000

* Result of discharge measurement.

PLATTE RIVER NEAR OVERTON, NEBR.

LOCATION.—Water-stage recorder in sec. 6, T. 8 N., R. 19 W., 4 miles south of Overton.

DRAINAGE AREA.—58,400 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records June 1918 to December 1923 and April 1925 to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, 8,440 second-feet Apr. 23 (gage height, 4.82 feet); no flow July 1 to Aug. 30.

1918–23, 1925–33: Maximum, 36,700 second-feet June 14, 1921; no flow at times.

REMARKS.—Records fair. Discharge estimated Dec. 8 to Mar. 7 on basis of two discharge measurements and temperature records. Numerous diversions from headwaters.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Aug.	Sept.
1.....	871	1,990	2,880	2,700	2,750	2,500	2,270	2,970	6,800	0	3,600
2.....	964	1,990	2,880				2,160	2,450	5,620	0	2,490
3.....	1,110	1,830	2,970				2,050	2,490	4,470	0	2,510
4.....	1,160	2,050	2,720				1,830	3,220	2,460	0	2,540
5.....	1,230	1,920	2,800				1,730	3,720	2,760	0	2,560
6.....	1,230	1,920	2,760	2,800	1,900	1,400	1,560	4,300	2,260	0	2,290
7.....	1,310	2,230	2,600			2,100	1,470	4,640	1,760	0	2,030
8.....	1,730	2,340	1,650			2,230	1,440	5,340	1,370	0	1,720
9.....	2,190	2,020				1,790	1,470	5,810	1,030	0	1,500
10.....	2,410	2,050				1,580	1,500	5,910	900	0	1,370
11.....	2,370	1,640	1,700	2,900	1,000	2,410	1,310	6,750	760	0	1,280
12.....	2,370	2,340				4,490	1,260	7,560	670	0	2,030
13.....	2,340	2,680				4,590	1,340	7,600	541	0	2,450
14.....	2,270	3,140				4,010	1,260	7,600	444	0	2,490
15.....	2,120	2,160				3,580	1,180	6,720	294	0	2,600
16.....	1,990	2,090	1,800	2,800	1,450	3,140	1,130	5,690	191	0	2,720
17.....	1,860	2,050				2,930	1,040	5,150	113	0	2,450
18.....	1,950	1,760				2,880	917	4,830	60	0	2,290
19.....	2,020	2,200				2,570	825	4,470	23	0	2,370
20.....	2,020	2,600				* 1,540	3,490	1,860	4,070	11	0
21.....	2,190	2,900	2,450	2,500	2,500	3,810	4,150	3,960	67	0	2,600
22.....	2,410	3,360				3,960	7,190	3,420	56	0	2,600
23.....	2,570	3,220				3,490	7,840	3,420	21	0	2,850
24.....	3,090	2,760				3,090	6,170	3,760	8	0	2,890
25.....	2,680	3,050				* 2,160	3,090	4,890	3,370	5	0
26.....	2,490	2,720	2,600	2,700	3,200	2,970	4,250	3,280	4	0	2,890
27.....	2,300	2,570				2,840	3,960	3,060	3	0	2,890
28.....	2,410	2,620				2,640	3,770	2,890	2	0	2,890
29.....	1,890	2,680				2,450	3,360	2,850	1	0	2,720
30.....	2,050	2,760				2,600	3,400	4,410	1	0	2,600
31.....	2,050					2,410		8,190		1,800	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3,090	871	1,990	122,000
November.....	3,360	1,640	2,390	142,000
December.....	2,970		2,260	139,000
January.....		2,160	2,720	167,000
February.....			2,060	114,000
March.....	4,590	1,400	2,870	176,000
April.....	7,840	825	2,620	156,000
May.....	8,190	2,450	4,640	285,000
June.....	6,800	1	1,120	66,600
August.....	1,800	0	58.1	3,570
September.....	3,600	1,280	2,450	146,000
The year.....	8,190	0	2,100	1,520,000

* Result of discharge measurement.

NOTE.—No flow during July.

PLATTE RIVER NEAR DUNCAN, NEBR.

LOCATION.—Staff gage in sec. 12, T. 16 N., R. 2 W., $1\frac{1}{2}$ miles south of Duncan
Zero of gage is 1,478.7 feet above mean sea level.

DRAINAGE AREA.—61,600 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933. At points 7 miles
downstream June 1895 to September 1915.

DISCHARGE.—Maximum during year, 8,490 second-feet Apr. 25 (gage height,
4.02 feet); no flow June 24 to July 6, Aug. 3, 4, 16-18, 21, Sept. 4-9.

1895-1915, 1928-33: Maximum, 51,100 second-feet June 23, 1915; no flow
at times.

REMARKS.—Records fair. Discharge estimated for Mar. 19, 20 and for period Nov.
17 to Feb. 15 on the basis of one discharge measurement and temperature
records. Numerous diversions from headwaters. Flow partly regulated by
reservoirs in Wyoming.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	15	1,710	1,400	1,600	5,390	2,310	3,240	2,530	0	71	2
2.....	14	1,470			4,730	2,040	2,970	3,170	0	14	2
3.....	15	1,570			4,880	1,800	2,620	5,880	0	0	2
4.....	17	1,750			6,130	1,620	2,020	4,880	0	0	0
5.....	19	1,750			6,250	1,530	1,870	4,070	0	2	0
6.....	17	1,620	1,800	750	6,130	1,450	2,500	3,000	0	5	0
7.....	17	1,490			5,550	1,430	3,000	2,250	25	6	0
8.....	17	1,280			3,980	1,430	3,750	1,410	52	5	0
9.....	19	1,660			3,630	1,390	4,600	1,050	61	5	0
10.....	21	2,150			3,420	1,120	4,500	948	34	5	29
11.....	20	1,770	2,000	450	2,040	1,100	5,230	675	5	5	262
12.....	21	1,660			2,750	934	5,080	540	10	4	460
13.....	19	1,660			2,870	802	5,500	590	15	3	864
14.....	96	1,350			3,200	778	5,820	478	6	2	1,020
15.....	675	1,170	2,200		3,600	990	6,070	420	7	1	1,190
16.....	850	334	2,500	500	3,670	906	6,320	295	6	0	1,370
17.....	948			550	3,560	892	5,180	176	20	0	1,330
18.....	962			571	3,380	778	4,690	101	71	0	1,220
19.....	934			900	3,200	802	4,280	47	38	2	1,120
20.....	934			1,800	1,800	802	3,900	15	21	2	1,050
21.....	934		1,000	3,500	1,280	802	3,710	71	6	0	1,050
22.....	1,330			5,200	1,470	1,450	3,820	15	6	4	1,020
23.....	284			7,870	3,980	4,320	4,190	2	8	6	1,050
24.....	778			6,800	4,780	5,230	4,110	0	8	5	1,150
25.....	1,750			6,380	4,240	8,130	3,000	0	5	2	1,120
26.....	1,750		1,600	6,010	3,940	6,130	3,000	0	5	2	1,150
27.....	1,870			4,410	2,940	4,980	3,140	0	4	1	1,370
28.....	1,970			4,880	2,750	3,670	3,310	0	2	1	1,410
29.....	1,750				2,620	3,480	3,280	0	2	2	1,280
30.....	1,750				2,650	3,520	2,750	0	1	2	1,260
31.....	1,770				2,620		2,530		13	2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,970	14	696	42,800
November.....	2,150	334	1,350	80,300
December.....			1,800	49,200
January.....			2,130	131,000
February.....	7,870		2,260	126,000
March.....	6,250	1,280	3,660	225,000
April.....	8,130	778	2,220	132,000
May.....	6,320	1,870	3,870	238,000
June.....	5,880	0	1,090	64,900
July.....	71	0	13 9	855
August.....	71	0	5 1	314
September.....	1,410	0	726	43,200
The year.....	8,130	0	1,570	1,130,000

• Result of discharge measurement.

• Estimated.

PLATTE RIVER NEAR ASHLAND, NEBR.

LOCATION.—Chain gage in sec. 29, T. 13 N., R. 10 E., 3 miles northeast of Ashland. Zero of gage (lowered 1.04 feet Aug. 19, 1929; elevation given in Water-Supply Papers 686, 701, 716, and 731 is 1.0 foot high) is 1,020.1 feet above mean sea level.

DRAINAGE AREA.—83,800 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 19,800 second-feet May 8 (gage height, 4.5 feet); minimum, not determined, occurred during winter.

1928-33: Maximum, 58,000 second-feet Feb. 28, 1932 (gage height, 6.7 feet); minimum not determined.

REMARKS.—Records fair. Discharge estimated during periods of ice effect, Nov. 15-28, Dec. 7 to Feb. 24 on basis of two discharge measurements and temperature records. Numerous diversions from headwaters. Flow partly regulated by reservoirs in Wyoming.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3,310	4,540	4,490			14,400	12,600	12,300	5,080	1,680	1,900	2,220
2.....	3,420	4,440	5,080			12,900	10,800	10,900	4,640	1,650	2,090	2,560
3.....	3,340	3,880	5,020	2,700	3,500	11,000	7,900	10,900	4,540	1,620	2,220	2,480
4.....	3,240	3,710	5,020			9,700	8,050	9,210	6,160	1,600	2,300	2,280
5.....	3,130	3,790	5,130			12,900	7,200	7,690	9,450	1,660	2,180	2,200
6.....		4,640	4,960			11,200	7,270	6,410	8,200	2,430	2,260	2,200
7.....	3,210	4,390				11,200	6,800	6,220	7,200	1,710	3,130	2,140
8.....	3,670	4,340		5,000	1,800	11,600	6,610	12,600	6,540	2,180	3,240	2,090
9.....	3,670	4,490	2,700			10,300	6,090	11,000	5,540	9,210	2,800	2,010
10.....	3,340	4,440				8,280	5,360	11,500	4,910	15,900	2,670	1,900
11.....	3,540	4,440				7,200	4,960	9,540	4,850	7,690	3,160	1,850
12.....	3,630	3,380				6,670	4,590	10,400	4,340	9,620	2,800	1,900
13.....	3,630	3,420	1,150	4,500	1,200	6,090	4,740	11,600	3,710	12,300	2,730	3,060
14.....	3,500	3,670				5,190	4,150	11,100	3,580	7,690	2,410	3,790
15.....	3,090	3,200				6,870	4,060	10,600	3,130	6,350	2,160	4,740
16.....	2,700				1,490	7,900	3,920	10,800	2,860	4,540	1,980	5,900
17.....	3,200			4,200		9,290	3,380	10,400	2,430	4,290	1,960	6,940
18.....	3,460	2,600	1,400		2,200	8,280	3,380	9,700	2,240	10,600	1,980	8,120
19.....	3,420			4,850		10,300	3,200	9,050	2,200	8,810	2,650	8,500
20.....	3,710			5,000		7,550	2,860	7,900	1,980	7,270	2,860	7,000
21.....	3,420					5,300	2,960	7,340	1,830	4,440	2,480	4,060
22.....	4,440				6,000	4,490	3,240	6,480	1,760	3,840	2,700	3,460
23.....	4,290	2,000	1,600	5,200		5,300	3,090	6,940	1,730	3,500	2,960	3,130
24.....	4,240				9,500	8,650	10,500	7,070	1,650	3,630	3,200	2,890
25.....	4,540				10,600	9,880	8,810	8,280	1,650	2,460	3,420	2,890
26.....	4,800	3,400			13,400	7,200	11,400	6,540	1,600	2,370	2,990	3,340
27.....	5,360	3,600			13,800	7,550	10,500	6,670	1,620	2,350	2,890	2,960
28.....	3,060	3,800			12,900	6,540	10,000	6,090	1,580	2,460	2,700	3,060
29.....	1,730	3,970	2,200	5,000		7,200	8,420	6,090	1,570	2,320	2,620	3,060
30.....	4,290	3,970				8,120	8,050	6,030	1,630	2,070	2,510	3,220
31.....	4,240					12,600		5,780		1,960	2,350	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	5,360	1,730	3,610	222,000
November.....	4,640		3,580	213,000
December.....	5,130		2,400	148,000
January.....			4,500	277,000
February.....	13,800		4,320	240,000
March.....	14,400	4,490	8,760	539,000
April.....	12,600	2,860	6,500	387,000
May.....	12,600	5,780	8,810	542,000
June.....	9,450	1,570	3,670	218,000
July.....	15,900	1,600	4,850	268,000
August.....	3,420	1,900	2,590	159,000
September.....	8,500	1,850	3,530	210,000
The year.....	15,900		4,770	3,450,000

* Result of discharge measurement.

ROCK CREEK NEAR ROCK RIVER, WYO.

LOCATION.—Water-stage recorder in sec. 4, T. 20 N., R. 76 W., 1½ miles southeast of Rock River.

DRAINAGE AREA.—184 square miles.

RECORDS AVAILABLE.—May 1928 to February 1933 (discontinued). Record March 1911 to November 1912 obtained at Phelan ranch in sec. 6, T. 20 N., R. 76 W.

DISCHARGE.—Maximum during year, 12 second-feet Oct. 9 (gage height, 0.53 foot); minimum not determined.

1928–33: Maximum, 1,180 second-feet May 29, 30, 1928; no flow Sept. 2–20, 1931, and Sept. 23, 1932.

REMARKS.—Records good except those for Oct. 21 to Feb. 28, which were estimated on the basis of two discharge measurements and temperature records. Diversions for irrigation above station. Flow partly regulated by two reservoirs.

Discharge, in second-feet, 1932–33

Day	Oct.	Jan.	Feb.	Day	Oct.	Jan.	Feb.	Day	Oct.	Jan.	Feb.
1.....	3			11.....	5	° 3.8		21.....	4		
2.....	3			12.....	4			22.....			
3.....	3			13.....	4			23.....			
4.....	4			14.....	4			24.....			
5.....	4			15.....	3			25.....			
6.....	3			16.....	3			26.....			
7.....	3			17.....	3		° 2	27.....			
8.....	4			18.....	3			28.....			
9.....	8			19.....	5			29.....			
10.....	7			20.....	4			30.....			
								31.....			

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	8		^b 4.0	246
November.....			^b 4.0	238
December.....			^b 3.0	184
January.....			^b 3.5	215
February.....			^b 2.4	133
The period.....				1,020

^a Result of discharge measurement.

^b Estimated.

DEER CREEK AT GLENROCK, WYO.

LOCATION.—Staff gage in sec. 4, T. 33 N., R. 75 W., at Glenrock, a quarter of a mile above mouth.

DRAINAGE AREA.—216 square miles.

RECORDS AVAILABLE.—April 1916 to September 1924; May 1928 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 1,810 second-feet May 23 (gage height, 6.50 feet); no flow July 28–30, Aug. 5, 6.

1916–24, 1928–33: Maximum, 4,600 second-feet Apr. 15, 1924; no flow during summers of 1919, 1922, 1933.

REMARKS.—Records good except those estimated for Apr. 30 to May 8, May 10–18. No record Dec. 9 to Apr. 28. Diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1.....		1,300	494	1.2	0.6	1.5	16.....		440	6	0.6	0.6	2.6
2.....		1,180	382	1.2	1.8	1.2	17.....		500	2.8	.8	1.5	5.5
3.....		1,100	348	1.2	1.0	1.2	18.....		620	2.6	.8	1.6	3.0
4.....		1,080	304	1.2	.4	1.2	19.....		780	2.2	.6	1.8	3.2
5.....		1,070	250	1.2	0	1.3	20.....		806	2.0	.7	1.8	3.0
6.....		1,050	220	.9	.5	2.4	21.....		1,090	1.8	.6	1.7	3.4
7.....		900	182	1.2	.7	2.0	22.....		1,030	2.4	.6	1.8	3.6
8.....		680	163	1.2	.8	1.9	23.....		1,560	2.2	.6	.6	3.6
9.....		502	140	1.2	.6	11.0	24.....		1,170	1.9	.2	.6	3.8
10.....		400	116	1.0	.6	7.5	25.....		919	2.0	.3	.6	4.5
11.....		380	93	.8	.4	8.5	26.....		780	1.1	.3	.9	5.5
12.....		350	74	1.0	.2	7.5	27.....		772	1.8	.2	1.1	7.5
13.....		340	84	1.0	.7	6.5	28.....		730	1.4	0	1.4	9.0
14.....		345	41	.8	.4	5.5	29.....	1,500	586	2.2	.1	2.0	8.9
15.....		380	18	.8	.2	3.0	30.....	1,350	524	1.4	.1	1.8	12.0
							31.....		517		.2	1.0	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May.....	1,560	340	770	47,300
June.....	494	1.1	98.1	5,840
July.....	1.2	0	.73	45
August.....	2	0	.96	59
September.....	12	1.2	4.68	278
The period.....				53,500

NOTE.—Records Oct. 1 to Dec. 8, 1932, published in Water-Supply Paper 731.

BOXELDER CREEK NEAR CAREYHURST, WYO.

LOCATION.—Water-stage recorder in sec. 13, T. 33 N., R. 74 W., 2 miles upstream from Careyhurst.

DRAINAGE AREA.—202 square miles.

RECORDS AVAILABLE.—May to October 1911; April 1916 to September 1924; May 1928 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 2,360 second-feet May 23 (gage height, 9.04 feet); no flow Oct. 4, 5.

1911, 1916-24, 1928-33: Maximum, that of May 23, 1933; no flow at times.

REMARKS.—Records good except those estimated for periods Oct. 23-31, Apr. 30 to May 18. No record Nov. 1 to Apr. 28. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Apr.	May	June	Jul	Aug.	Sept.
1	1.7		640	535	1.2	0.8	0.7
2	2.1		560	514	1.4	.8	.6
3	1.1		560	454	1.0	.8	.6
4	0		560	380	.8	.8	.6
5	0		510	320	.8	.8	.6
6	1.9		440	252	.7	.8	.6
7	2.1		320	206	.7	.8	.6
8	2.6		200	168	.8	.8	.8
9	2.8		132	130	.8	.8	1.0
10	3.5		120	107	.8	.8	.6
11	4.5		100	81	.7	.8	.6
12	5.5		100	71	.8	.8	.7
13	8		110	57	.8	.8	.7
14	11		150	42	.8	1.2	.7
15	16		200	35	.8	1.4	.7
16	15		270	14	.8	1.0	.7
17	2.8		360	4.5	.8	1.0	.7
18	2.6		460	2.4	.8	1.0	.8
19	4		563	4.0	.8	1.1	.7
20	14		612	13	.8	1.1	.8
21	20		748	2.6	1.0	1.1	.6
22	24		801	3.0	1.7	1.1	.6
23	22		1,480	2.4	2.4	1.0	.6
24	18		1,140	1.4	2.1	1.0	.6
25	16		896	1.2	1.1	1.1	.7
26	14		776	1.1	.6	2.6	.7
27	12		794	1.0	.6	79	.8
28	12		787	1.0	.7	24	.8
29	14	780	650	1.1	.8	3.5	.8
30	16	740	594	1.2	.8	1.1	.8
31	16		563		.8	1.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	24	0	9.20	566
May	1,480	100	522	32,100
June	535	1.0	114	6,780
July	2.4	.6	.95	58.4
August	79	.8	4.35	267
September	1.0	.6	.69	41.1

LA PRELE CREEK NEAR DOUGLAS, WYO.

LOCATION.—Water-stage recorder in sec. 6, T. 31 N., R. 73 W., 16 miles southwest of Douglas.

DRAINAGE AREA.—146 square miles.

RECORDS AVAILABLE.—August 1919 to September 1933.

DISCHARGE.—Maximum during year, 998 second-feet May 23 (gage height, 10.4 feet); minimum, 1.0 second-foot Aug. 15-19.

1919-33: Maximum, 1,220 second-feet May 11, 1920 (gage height, 11.4 feet); minimum, 0.4 second-foot Oct. 2, 1919 (gage height, 3.29 feet). Average, 14 years (1919-33), 49.1 second-feet.

REMARKS.—Records fair. Discharge estimated Oct. 4-5, 11, Nov. 9-18, 20, 21 and Nov. 23 to Mar. 14 on basis of one discharge measurement and temperature records. Diversions for irrigation above station. Gage-height record furnished by Douglas Reservoir Water Users Association.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1.2	12			46	694	348	1.9	2.4	2.7
2.....	1.1	12			27	567	327	2.3	2.9	2.3
3.....	1.1	12			5.6	593	292	2.3	2.7	2.3
4.....	1.1	12			17	589	257	2.4	2.4	2.3
5.....	1.2	12			35	575	218	2.7	2.2	2.4
6.....	1.3	13		9	22	521	183	2.9	2.2	2.4
7.....	2.0	13			22	476	156	3.4	2.3	2.4
8.....	4.2	13			34	405	131	3.7	2.3	1.1
9.....	6.2	10			16	316	108	3.7	2.0	4.2
10.....	6.7	10			11	289	87	3.7	1.1	4.2
11.....	7.5	9			7.3	298	74	4.0	1.1	4.2
12.....	8.5	9		15	4.0	286	76	3.7	1.2	4.2
13.....	9.1	10	5.6		4.2	260	52	3.7	1.4	4.2
14.....	12	9			1.1	246	41	9.1	1.2	4.2
15.....	13	8		20	1.9	264	33	12	1.0	4.2
16.....	9.8	8		17	8.2	316	28	7.0	1.0	4.2
17.....	11	7		16	75	364	23	5.3	1.0	4.5
18.....	12	7		18	158	429	21	4.0	1.0	4.2
19.....	14	6.4		24	237	460	14	3.4	1.0	4.2
20.....	16	6.2		26	211	456	9.1	2.7	1.2	4.2
21.....	12	6.0		36	282	535	8.8	2.3	1.2	4.2
22.....	12	5.9		34	345	553	7.9	2.2	1.1	3.7
23.....	12			38	351	900	5.9	2.0	1.1	3.7
24.....	12			37	316	718	2.4	2.0	1.1	3.7
25.....	12.0			31	306	576	2.3	2.3	1.3	4.0
26.....	9.1	6		33	389	519	2.3	1.7	1.9	4.0
27.....	10			35	533	515	2.3	1.4	2.9	4.0
28.....	10			35	732	501	2.3	1.6	4.0	4.0
29.....	11			35	786	413	2.2	1.6	2.9	4.0
30.....	12			36	696	373	1.9	1.6	2.9	3.7
31.....	12			38		356		2.2	2.7	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	16	1.1	8.49	522
November.....	13	5.9	8.62	513
December.....			5.5	338
January.....			6	369
February.....			6	333
March.....	38		21.3	1,310
April.....	786	1.1	189	11,200
May.....	900	246	463	28,500
June.....	348	1.9	83.9	4,990
July.....	12	1.4	3.38	208
August.....	4	1	1.83	113
September.....	4.5	1.1	3.59	214
The year.....	900	1	67.2	48,600

* Result of discharge measurement.

* Estimated.

LA PRELE CREEK NEAR ORPHA, WYO.

LOCATION.—Staff gage in sec. 16, T. 33 N., R. 72 W., 1 mile south of Orpha and three-quarters of a mile above mouth.

DRAINAGE AREA.—227 square miles.

RECORDS AVAILABLE.—April to August 1916; April to September 1918; April 1923 to September 1924; May 1928 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 1,140 second-feet May 23 (gage height, 5.95 feet); minimum, 0.8 second-foot June 26, 27 (gage height, 0.2° foot).

1916, 1918, 1923–24, 1928–33: Maximum, that of May 23, 1933; no flow several days during 1931 and 1932.

REMARKS.—Records good except those estimated for periods May 1–8, 10–18, 20. No record Dec. 1 to Apr. 30. Diversions for irrigation above station. Flow regulated by La Prele Reservoir, capacity, 20,000 acre-feet.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1-----	6.0	241	2.6	3.3	4.5	16-----	76	14	5.1	2.8	3.6
2-----	6.0	177	4.2	4.2	3.6	17-----	76	12	4.2	2.2	3.9
3-----	6.0	156	10	5.4	3.0	18-----	76	7.8	3.3	2.4	4.5
4-----	6.0	150	14	4.8	3.9	19-----	77	3.9	2.8	3.0	4.2
5-----	6.0	143	13	3.9	4.2	20-----	100	3.6	2.0	3.3	4.8
6-----	6.0	115	9.3	3.0	4.5	21-----	167	2.6	1.4	3.9	5.4
7-----	6.0	64	5.4	2.4	4.8	22-----	204	2.2	1.0	3.3	5.7
8-----	6.0	57	2.8	2.6	5.4	23-----	723	1.4	1.2	2.8	6.0
9-----	6.0	49	2.6	2.6	5.7	24-----	1,070	1.0	1.4	2.8	6.6
10-----	40	39	3.3	2.0	6.6	25-----	867	1.4	1.0	2.8	7.2
11-----	75	22	3.9	1.4	6.3	26-----	730	1.2	1.2	3.9	6.9
12-----	75	19	4.5	1.4	5.4	27-----	617	.9	1.8	4.8	6.0
13-----	75	18	3.9	1.6	5.1	28-----	558	1.4	2.0	5.4	5.7
14-----	75	16	3.0	2.2	4.2	29-----	466	2.0	3.0	6.0	4.8
15-----	75	17	5.4	2.4	3.6	30-----	387	2.8	3.6	5.7	4.5
						31-----	330		3.6	4.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May-----	1,070	6.0	226	13,900
June-----	241	.9	44.7	2,660
July-----	14	1.0	4.08	251
August-----	6.0	1.4	3.33	205
September-----	7.2	3.0	5.02	299
The period-----				17,300

NOTE.—Records for Oct. 1 to Nov. 30, 1932, published in Water-Supply Paper 731.

LA BONTE CREEK NEAR LA BONTE, WYO.

LOCATION.—Chain gage in sec. 21, T. 31 N., R. 71 W., $1\frac{1}{2}$ miles above mouth and 3 miles east of La Bonte.

DRAINAGE AREA.—302 square miles.

RECORDS AVAILABLE.—April 1916 to September 1924; May 1928 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 1,360 second-feet May 22 (gage height, 3.96 feet); no flow Aug. 10-14.

1916-24, 1928-33: Maximum, 2,750 second-feet May 22, 23, 1923 (gage height, 7.5 feet); no flow during summers of 1917, 1918, 1931, 1933.

REMARKS.—Records fair. No record Dec. 1 to Apr. 14, Apr. 16 to May 20. Diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1			274	6	3	0.5	16			19	5	0.1	0.2
2			204	6	1	.6	17			15	5	.1	.2
3			189	6	.2	.5	18			14	5	.2	.2
4			172	6	.6	.5	19			13	5	1	.2
5			148	5	.5	.5	20			12	5	1	.2
6			130	6	.2	.2	21		754	12	5	1	.2
7			112	5	.1	.2	22		754	12	5	1	.2
8			97	5	.1	.5	23		1,320	11	5	1	.2
9			84	5	.1	1	24		1,000	11	3	1	.2
10			66	5	0	.8	25		862	11	2	1	.2
11			52	5	0	.6	26		645	9	3	1	.5
12			49	5	0	.5	27		738	7	3	1	.6
13			46	6	0	.5	28		473	6	3	2	.2
14			186	19	0	.2	29		419	6	3	1	.2
15	44		59	6	.1	.2	30		361	6	5	1	.2
							31		331		4	.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 21-31	1,320	331	696	15,200
June	274	6	67.7	4,030
July	19	2	5.23	322
August	3	0	.65	40
September	1	.2	.37	22
The period				19,600

NOTE.—Records Oct. 1 to Nov. 30, 1932, published in Water-Supply Paper 731.

HORSESHOE CREEK NEAR GLEND0, WYO.

LOCATION.—Staff gage in sec. 26, T. 29 N., R. 68 W., 4 miles southeast of Glendo.

DRAINAGE AREA.—203 square miles.

RECORDS AVAILABLE.—April 1916 to September 1919; April 1921 to September 1924; May 1928 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 1,050 second-feet May 23 (gage height, 5.50 feet); minimum, 1.0 second-foot Sept. 8, 9 (gage height, 0.69 foot).

1916-19, 1921-24, 1928-33: Maximum, 1,210 second-feet June 2, 1929 (gage height, 6.8 feet); no flow during summers of 1918 and 1919.

REMARKS.—Records good except those estimated for May 19-22. No record Dec. 1 to Apr. 12, Apr. 14 to May 17. Diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1			185	3.3	2.8	1.6	16			13	3.0	2.2	3.3
2			166	3.3	2.8	1.8	17			9.2	3.2	2.5	2.8
3			144	3.3	3.0	1.6	18		322	7.2	3.2	2.2	1.7
4			140	3.2	2.9	1.4	19		390	5.8	3.0	2.5	1.7
5			120	3.2	2.8	1.8	20		380	5.0	2.8	2.0	1.7
6			91	3.6	2.5	1.6	21		450	5.5	2.9	2.2	1.5
7			84	3.6	2.8	1.4	22		480	5.5	2.8	2.2	1.5
8			81	3.3	2.9	1.1	23		797	4.1	2.9	1.7	1.5
9			65	3.3	3.3	1.0	24		457	4.1	2.6	1.7	1.6
10			52	3.0	2.8	1.6	25		404	5.5	2.6	1.8	2.3
11			41	3.2	3.2	1.4	26		396	5.3	2.9	1.6	2.0
12			35	3.0	3.0	1.4	27		336	4.6	3.0	1.5	1.5
13	8.8		31	3.0	3.3	1.8	28		298	4.1	2.8	1.6	1.5
14			28	3.2	2.8	2.4	29		274	3.6	2.0	1.6	1.5
15			17	3.2	2.6	4.1	30		232	3.3	2.2	1.5	1.4
							31		207		2.1	1.5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 18-31	797	207	387	10,700
June	185	3.3	45.5	2,710
July	3.6	2.0	2.99	184
August	3.3	1.5	2.38	146
September	24	1.0	2.57	149
The period				13,900

NOTE.—Records for Oct. 1 to Nov. 30, 1932, published in Water-Supply Paper 731.

COTTONWOOD CREEK AT WENDOVER, WYO.

LOCATION.—Chain gage in sec. 15, T. 27 N., R. 67 W., at Wendover, half a mile above mouth of creek.

DRAINAGE AREA.—159 square miles.

RECORDS AVAILABLE.—April 1916 to September 1924; May 1925 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 212 second-feet May 23 (gage height, 3.18 feet); minimum, 0.9 second-foot Sept. 25 (gage height, 1.96 feet).

1916-24, 1929-33: Maximum, 840 second-feet June 1, 1925 (gage height, 5.02 feet); no flow July 12, 15, 1932.

Maximum stage known, 10.6 feet Aug. 15, 1927 (discharge, about 5,800 second-feet).

REMARKS.—Records good except those estimated for May 1-8, 10-17, 19-20. No record Dec. 1 to Apr. 12, Apr. 14-30. Diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1.....		120	38	4.6	2.4	3.0	16.....		45	12	2.7	2.4	2.7
2.....		115	30	5.4	3.0	2.7	17.....		40	11	4.6	3.0	3.0
3.....		110	17	6.2	3.0	1.8	18.....		37	9.4	2.7	3.0	3.0
4.....		105	13	6.2	2.4	1.8	19.....		50	6.2	3.0	2.1	2.7
5.....		95	17	4.6	2.7	2.1	20.....		60	6.2	2.4	2.4	3.0
6.....		90	17	7.0	2.4	1.8	21.....		71	7.0	2.7	3.0	2.7
7.....		85	17	8.6	2.7	2.7	22.....		63	7.8	3.0	2.7	2.7
8.....		75	14	6.2	1.8	3.0	23.....		167	6.2	2.1	2.7	3.8
9.....		66	15	4.6	3.0	4.6	24.....		157	5.4	3.0	3.0	2.4
10.....		70	15	3.8	2.4	3.0	25.....		134	7.8	2.7	2.7	.9
11.....		65	11	4.6	1.8	3.0	26.....		116	7.8	3.0	4.6	2.1
12.....		60	12	4.6	2.1	3.0	27.....		95	7.8	2.4	4.6	2.1
13.....	4.6	55	13	3.0	3.0	3.0	28.....		95	9.4	1.8	3.0	2.7
14.....		50	9.4	4.6	3.0	2.4	29.....		87	6.2	2.4	3.0	2.7
15.....		50	10	6.2	2.4	3.0	30.....		62	5.4	2.1	3.0	2.7
							31.....		50		2.4	3.0	

Mouth	Maximum	Minimum	Mean	Run-off in acre-feet
May.....	167	37	81.9	5,040
June.....	38	5.4	12.1	720
July.....	8.6	1.8	3.97	244
August.....	4.6	1.8	2.78	171
September.....	4.6	.9	2.67	159
The period.....				6,330

NOTE.—Records for Oct. 1 to Nov. 30, 1932, published in Water-Supply Paper 731.

LARAMIE RIVER NEAR JELM, WYO.

LOCATION.—Water-stage recorder in sec. 15, T. 12 N., R. 77 W., a quarter of a mile north of Colorado-Wyoming line and 4 miles south of old Jelm. Zero of gage is 7,685.32 feet above mean sea level.

DRAINAGE AREA.—297 square miles.

RECORDS AVAILABLE.—June 1904 to October 1905; May 1911 to September 1933.

DISCHARGE.—Maximum during year, 1,590 second-feet June 5 (gage height, 3.71 feet); minimum not determined, but probably occurred during winter.

1904-5, 1911-33: Maximum, 4,200 second-feet June 9, 1923 (gage height, 4.15 feet); minimum not determined.

REMARKS.—Records excellent except those for periods Nov. 8-9, 11-14, 21-23, Dec. 8 to Apr. 10, which were based on two discharge measurements and temperature records. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	34	52	44	20	28	26	60	125	1,280	292	87	34	
2.....	32	50	42					120	1,470	252	81	30	
3.....	32	50	42					115	1,440	245	78	30	
4.....	32	46	40					110	1,400	322	72	29	
5.....	32	47	39					117	1,490	237	64	29	
6.....	30	52	36	24	17	28	74	120	1,470	194	60	28	
7.....	28	46	30					99	1,460	264	62	26	
8.....	28	46	28					93	1,220	326	62	29	
9.....	35	46						79	1,220	256	60	40	
10.....	40	44						78	1,400	184	54	47	
11.....	43	46	16	21	18	32	79	79	1,430	158	53	58	
12.....	46						101	67	1,490	147	49	101	
13.....	54						83	69	1,400	127	46	72	
14.....	60						87	72	1,380	115	44	58	
15.....	56						52	99	76	1,280	113	43	52
16.....	52	53	18	22	21	34	117	83	1,220	105	42	47	
17.....	50	56					149	99	1,180	99	43	44	
18.....	52	56					204	141	1,240	101	44	44	
19.....	50	58					130	187	1,070	97	47	47	
20.....	43	52					62	222	1,120	93	53	49	
21.....	54	46	21	24	28	36	171	288	998	87	47	46	
22.....	56						264	343	862	83	43	46	
23.....	54						352	339	745	87	42	47	
24.....	50						49	252	330	639	83	37	43
25.....	43						50	174	322	598	70	36	40
26.....	54	52	24	24	53	135	375	529	69	36	67		
27.....	49	46				113	448	480	69	47	89		
28.....	52	49				127	618	433	65	54	85		
29.....	47	42				133	731	399	65	49	72		
30.....	50	43				130	900	343	65	43	62		
31.....	46						1,110		70	36			

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	60	28	44.6	2,740
November	58	42	48.6	2,890
December	44		25	1,540
January			26.3	1,430
February			22.7	1,260
March			35.4	2,180
April	352		121	7,200
May	1,110	67	257	15,800
June	1,490	343	1,090	64,900
July	326	65	146	8,980
August	87	36	52.1	3,200
September	101	26	46.7	2,960
The year	1,490		156	115,000

• Result of discharge measurement.

LARAMIE RIVER AND PIONEER CANAL NEAR WOODS, WYO.

LOCATION.—Water-stage recorder in sec. 36, T. 14 N., R. 77 W., at diversion dam for Pioneer Canal, 2 miles east of Woods. Staff gage about half a mile below headgates is used to determine flow in canal.

DRAINAGE AREA.—418 square miles.

RECORDS AVAILABLE.—April 1912 to September 1924; April to September 1927; April 1932 to September 1933.

DISCHARGE.—Laramie River: Maximum during year, 2,000 second-feet June 5 (gage height, 3.00 feet); no flow for several days in July, August, and September.

Pioneer Canal: Maximum during year, 157 second-feet June 5-7 (gage height, 1.96 feet); minimum (estimated), 5 second-feet Oct. 23 to Nov. 6.

1912-24, 1927, 1932-33: Combined maximum, 5,060 second-feet June 10, 1923; combined minimum not determined.

REMARKS.—Records good. Flow of canal estimated Oct. 23 to Nov. 6, Apr. 25-30. No record Nov. 7 to Apr. 24. Canal diverts from left bank of river at diversion dam for irrigation in the vicinity of Laramie. Diversions for irrigation above station.

Discharge, in second-feet, of Laramie River near Woods, 1932-33

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1.....	0	53	-----	182	1,540	285	12	2
2.....	0	50	-----	190	1,760	240	17	0
3.....	1	56	-----	174	1,690	226	17	0
4.....	3	48	-----	174	1,600	301	14	0
5.....	1	53	-----	194	1,830	231	3	0
6.....	0	48	-----	208	1,730	182	0	0
7.....	3	-----	-----	178	1,720	235	4	0
8.....	7	-----	-----	148	1,410	306	10	1
9.....	12	-----	-----	122	1,290	235	6	6
10.....	21	-----	-----	111	1,440	151	5	10
11.....	12	-----	-----	125	1,530	107	6	10
12.....	9	-----	-----	114	1,600	89	5	46
13.....	8	-----	-----	100	1,520	70	3	50
14.....	19	-----	-----	111	1,400	56	0	24
15.....	15	-----	-----	114	1,340	50	0	15
16.....	0	-----	-----	129	1,250	41	0	8
17.....	0	-----	-----	136	1,220	35	0	5
18.....	0	-----	-----	203	1,220	35	0	4
19.....	0	-----	-----	328	1,100	35	3	7
20.....	2	-----	-----	405	1,100	37	10	9
21.....	24	-----	-----	519	991	32	6	7
22.....	41	-----	-----	604	892	24	0	5
23.....	41	-----	-----	590	764	26	0	7
24.....	37	-----	-----	550	628	21	0	7
25.....	23	-----	125	540	580	8	0	6
26.....	32	-----	118	556	519	6	0	15
27.....	43	-----	122	724	450	3	8	60
28.....	53	-----	182	908	405	0	21	63
29.....	46	-----	203	1,000	387	0	14	48
30.....	50	-----	199	1,190	345	2	4	32
31.....	41	-----	-----	1,380	-----	-----	6	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	53	0	17.5	1,080
November 1-6.....	56	48	51.3	610
April 25-30.....	203	118	158	1,880
May.....	1,380	100	387	23,800
June.....	1,830	345	1,180	70,200
July.....	306	0	99.0	6,090
August.....	21	0	5.61	345
September.....	63	0	14.9	887

Discharge, in second-feet, of Pioneer Canal near Woods, Wyo., 1932-33

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	30	5		10	132	51	69	30
2	29	5		10	138	49	71	32
3	29	5		10	138	54	68	30
4	25	5		10	150	54	65	27
5	25	5		11	157	54	63	27
6		5		11	157	54	63	24
7	37			11	157	63	55	22
8	37			10	145	66	56	28
9	28			10	145	72	59	29
10	27			10	148	71	58	32
11	34			10	150	73	60	40
12	35			10	150	71	45	40
13	50			9	152	71	44	41
14	52			10	148	69	45	35
15	40			9	150	69	42	35
16	52			8	150	66	41	38
17	48			8	148	67	38	38
18	48			44	148	66	38	31
19	50			44	148	55	41	30
20	44			48	143	56	45	30
21	13			54	138	54	47	30
22	13			57	132	58	45	30
23	5			54	130	58	40	30
24	5			55	126	57	38	29
25	5		9	55	118	65	32	29
26	5		9	82	114	62	32	29
27	5		9	82	104	64	33	29
28	5		9	98	100	64	33	29
29	5		9	102	85	60	33	29
30	5		10	98	47	58	32	29
31	5			108		61	28	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	52	5	26.4	1,620
November 1-6			5.0	60
April 25-30	10	9	9.2	109
May	108	8	37.0	2,280
June	157	47	135	8,030
July	73	49	61.7	3,790
August	71	28	47.1	2,900
September	41	22	31.1	1,850

Combined monthly discharge of Laramie River and Pioneer Canal near Woods, Wyo., 1932-33

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	71	26	43.9	2,700
November 1-6	61	53	56.3	670
April 25-31	212	127	167	1,990
May	1,490	109	425	26,100
June	1,990	392	1,170	78,000
July	372	60	161	9,900
August	88	32	52.7	3,240
September	92	22	46.0	2,740

LARAMIE RIVER AT LARAMIE, WYO.

LOCATION.—Chain gage in sec. 33, T. 16 N., R. 73 W., at west edge of Laramie.

RECORDS AVAILABLE.—April to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 1,350 second-feet June 7 (gage height, 4.46 feet); minimum, 6.4 second-feet Sept. 7, 8 (gage height, 0.87 foot).

REMARKS.—Records good except July 2-7, which were estimated. Diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		91	820	296	24	10	16		40	1,120	95	12	27
2		84	966	296	24	8.6	17		36	1,030	86	11	21
3		81	1,130	296	22	7.8	18		34	999	132	11	20
4		78	1,260	292	23	8.6	19		34	944	78	11	16
5		78	1,270	292	24	6.8	20		62	944	68	12	13
6		71	1,230	288	23	6.6	21		93	900	60	12	13
7		70	1,340	288	20	6.6	22		134	795	56	11	12
8		68	1,330	288	20	6.6	23		300	705	48	11	13
9		65	1,270	260	18	11	24	76	264	620	44	10	12
10		62	1,130	236	17	13	25	81	232	530	43	9	12
11		56	1,110	182	16	13	26	64	240	434	37	11	14
12		53	1,160	136	15	15	27	70	264	362	33	15	13
13		56	1,200	106	14	16	28	84	337	296	30	14	12
14		52	1,220	98	13	24	29	93	476	304	27	14	19
15		43	1,190	113	13	32	30	98	560	304	24	14	28
							31		680			13	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 24-30	98	64	80.9	1,120
May	680	34	155	9,530
June	1,340	296	930	55,300
July	296	24	140	8,610
August	24	9	15.4	947
September	32	6.6	14.4	857
The period				76,400

LARAMIE RIVER AT TWO RIVERS, WYO.

LOCATION.—Water-stage recorder in sec. 5, T. 17 N., R. 74 W., $\frac{1}{4}$ quarter of a mile above Little Laramie River. Gage at same site and datum as used 1911-27. Zero of gage is 7,058.90 feet above mean sea level.

DRAINAGE AREA.—1,290 square miles.

RECORDS AVAILABLE.—May 1911 to October 1927; May to September 1933.

DISCHARGE.—Maximum during year, 1,240 second-feet June 9 (gage height, 4.78 feet); minimum, 8.6 second-feet Sept. 30 (gage height, 0.82 foot).

1911-27, 1933; Maximum, 3,930 second-feet June 13, 1923 (gage height, 7.48 feet); no flow Sept. 22-25, 1911.

REMARKS.—Records good except those for May 21, 23-24, June 6, July 23-26, which are estimated. Diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1.....		548	253	31	11	16.....		1,160	107	12	23
2.....		774	229	29	11	17.....		20	9'	11	25
3.....		895	200	29	10	18.....		16	970	8	22
4.....		970	182	29	10	19.....		15	935	117	18
5.....		1,080	185	28	10	20.....		26	900	87	15
6.....		1,100	202	27	9.8	21.....		27	876	77	13
7.....		1,120	189	27	9.2	22.....		28	809	67	10
8.....		1,210	178	25	9.2	23.....		40	694	55	9.8
9.....		1,230	196	23	9.2	24.....		100	586	57	9.2
10.....		1,170	212	18	9.2	25.....		160	524	43	8.9
11.....		1,010	182	16	8.9	26.....		167	409	42	8.9
12.....		1,020	154	15	9.5	27.....		171	339	37	8.9
13.....		1,120	124	14	9.8	28.....		205	287	33	8.9
14.....		1,160	101	14	10	29.....		271	248	34	8.9
15.....		1,210	100	13	15	30.....		378	253	34	8.6
						31.....		458		33	11

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 17-31.....	458	15	139	4,140
June.....	1,230	248	866	50,900
July.....	253	33	118	7,260
August.....	31	10	16.8	1,030
September.....	25	8.6	11.7	696
The period.....				64,000

LARAMIE RIVER NEAR LOOKOUT, WYO.

LOCATION.—Water-stage recorder in sec. 27, T. 21 N., R. 74 W., 9 miles north-east of Lookout. Zero of gage is 6,962.68 feet above mean sea level.

DRAINAGE AREA.—2,100 square miles.

RECORDS AVAILABLE.—May 1912 to August 1917; April 1932 to September 1933.

DISCHARGE.—Maximum during year, 1,690 second-feet June 15 (gage height, 4.58 feet); minimum, 3 second-feet Oct. 14–16.

1912–17, 1932–33: Maximum (estimated), 3,100 second-feet June 26, 1917; minimum, that of Oct. 14–16, 1932.

REMARKS.—Records good except those for Oct. 30, 31, Sept. 17–22, which were estimated. No records Nov. 1 to Apr. 29. Diversions for irrigation above station.

Discharge, in second-feet, 1932–33

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	4		75	280	272	41	15
2	4		73	388	252	38	12
3	4		73	505	223	34	10
4	4		65	770	208	40	8
5	4		65	884	184	41	7
6	4		54	1,120	173	45	6
7	3		52	1,300	236	38	6
8	4		46	1,370	233	38	30
9	5		48	1,490	293	34	21
10	5		43	1,510	337	31	16
11	4		40	1,450	279	30	12
12	4		40	1,300	217	24	10
13	4		40	1,440	176	24	8
14	3		40	1,600	149	22	8
15	3		38	1,660	131	19	8
16	3		38	1,650	126	17	9
17	4		33	1,630	134	16	8
18	4		28	1,490	129	15	8
19	5		27	1,340	117	15	8
20	6		23	1,240	129	14	8
21	15		19	1,200	107	14	8
22	18		16	1,220	93	13	8
23	5		28	1,120	84	13	8
24	4		28	1,020	71	12	7
25	3		50	794	67	12	6
26	4		86	674	63	15	6
27	3		88	525	56	21	5
28	3		95	400	46	23	5
29	3		112	322	41	23	5
30	3	78	134	286	40	22	4
31	3		202		38	18	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18	3	4.7	280
May	202	16	58.0	3,570
June	1,660	286	1,070	63,700
July	337	38	152	9,350
August	45	12	24.6	1,510
September	30	4	9.3	553

LARAMIE RIVER NEAR WHEATLAND, WYO.

LOCATION.—Staff gage in sec. 35, T. 25 N., R. 69 W., at highway bridge 10 miles west of Wheatland.

DRAINAGE AREA.—2,480 square miles.

RECORDS AVAILABLE.—April 1912 to November 1916; October 1929 to February 1933 (discontinued).

DISCHARGE.—Maximum during year, 6 second-feet Nov. 27–29 (gage height, 1.64 feet); no flow Oct. 1, 2, 4, 6, 7.

1912–16, 1929–33: Maximum (mean daily), 1,660 second-feet June 8, 1914; no flow for short periods in 1916, 1932.

REMARKS.—Records fair. Flow regulated by Wheatland Reservoir, capacity about 80,000 acre-feet.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Jan.	Feb.	Day	Oct.	Nov.	Jan.	Feb.
1-----	0	2	-----	-----	16-----	2	4	-----	-----
2-----	0	2	-----	-----	17-----	2	5	-----	-----
3-----	.1	3	^a 3.7	-----	18-----	2	5	-----	-----
4-----	0	2	-----	-----	19-----	3	5	-----	-----
5-----	.1	2	-----	-----	20-----	3	5	-----	-----
6-----	0	2	-----	-----	21-----	2	5	-----	-----
7-----	0	3	-----	-----	22-----	2	5	-----	-----
8-----	.2	3	-----	-----	23-----	2	5	-----	-----
9-----	.7	3	-----	-----	24-----	2	5	-----	-----
10-----	.9	4	-----	-----	25-----	2	5	-----	-----
11-----	.9	4	-----	-----	26-----	3	5	-----	-----
12-----	1	4	-----	-----	27-----	2	6	-----	-----
13-----	1	4	-----	^a 3.0	28-----	3	6	-----	-----
14-----	2	4	-----	-----	29-----	4	6	-----	-----
15-----	2	4	-----	-----	30-----	4	5	-----	-----
					31-----	3	-----	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	4	0	1.61	99
November-----	6	2	4.1	244
December-----	-----	-----	^b 3.5	215
January-----	-----	-----	^b 4.0	246
February-----	-----	-----	^b 4.0	222
The period-----	-----	-----	-----	1,030

^a Result of discharge measurement.

^b Estimated.

LARAMIE RIVER NEAR FORT LARAMIE, WYO.

LOCATION.—Staff gage in sec. 25, T. 26 N., R. 65 W. at siphon crossing of Fort Laramie Canal, 3 miles west of Fort Laramie.

DRAINAGE AREA.—4,580 square miles.

RECORDS AVAILABLE.—April 1915 to September 1933.

REMARKS.—Diversions for irrigation above station. Discharge tables include flow of Lingle Power Plant canal, which diverts water from river 4 miles upstream. Flow regulated by Wheatland Reservoir, capacity about 80,000 acre-feet. Complete records furnished by United States Bureau of Reclamation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	29	79	81	83	83	130	79	675	246	14	17	39
2.....	29	79	81	82	84	130	79	471	228	14	17	33
3.....	30	84	81	92	86	130	79	442	188	14	17	33
4.....	33	79	81	92	85	130	79	410	177	14	17	33
5.....	35	79	81	101	85	90	79	560	152	14	17	28
6.....	38	74	80	99	63	84	74	560	136	14	17	24
7.....	42	74	53	99	62	120	74	560	120	14	17	24
8.....	45	74	53	84	42	120	74	515	105	17	17	24
9.....	45	74	68	84	43	120	74	442	90	17	17	24
10.....	54	79	70	95	42	120	74	410	68	52	17	24
11.....	47	85	81	95	42	115	74	410	52	39	17	24
12.....	58	73	80	105	53	117	74	423	60	28	17	24
13.....	60	74	80	90	43	117	94	416	52	28	17	28
14.....	55	88	80	89	43	117	74	397	52	28	17	24
15.....	54	79	80	98	44	115	74	322	46	28	17	28
16.....	49	79	80	90	46	110	72	350	28	28	17	28
17.....	54	88	80	83	46	104	72	350	28	42	14	28
18.....	59	88	83	85	56	104	72	350	28	34	14	28
19.....	69	88	85	86	66	94	72	378	24	17	14	24
20.....	74	83	85	85	80	94	92	410	24	17	14	24
21.....	69	81	85	88	92	94	41	425	20	17	14	24
22.....	74	81	85	85	92	94	52	442	17	14	14	28
23.....	69	81	85	85	84	94	47	475	52	14	14	25
24.....	69	81	85	85	94	94	181	515	52	17	11	28
25.....	69	81	85	84	84	94	261	625	28	17	11	28
26.....	74	81	87	84	106	84	324	575	28	17	14	33
27.....	74	81	83	84	106	84	383	435	22	14	136	39
28.....	80	81	83	85	106	84	393	350	20	14	34	28
29.....	74	81	83	86	-----	84	543	339	20	14	45	28
30.....	74	81	83	85	-----	79	730	322	14	20	45	28
31.....	80	-----	83	85	-----	79	-----	272	-----	17	45	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	80	29	56.9	3,500
November.....	88	73	80.3	4,780
December.....	87	53	79.7	4,900
January.....	105	82	88.8	5,460
February.....	106	42	69.9	3,880
March.....	130	79	104	6,400
April.....	730	41	150	8,930
May.....	675	272	440	27,100
June.....	246	14	72.3	4,300
July.....	52	14	20.9	1,290
August.....	136	11	22.9	1,410
September.....	39	24	27.8	1,650
The year.....	730	11	102	73,600

LITTLE LARAMIE RIVER NEAR FILMORE, WYO.

LOCATION.—Staff gage in sec. 9, T. 15 N., R. 77 W., at Mays ranch, 1½ miles south of Filmore. Gage at same site and datum as used 1911–26.

DRAINAGE AREA.—155 square miles.

RECORDS AVAILABLE.—July 1902 to August 1903; May 1911 to September 1926; May to September 1933.

DISCHARGE.—Maximum during year, 1,190 second-feet June 12 (gage height 3.80 feet); minimum, 13 second-feet Sept. 4, 6, 21–24, 27–30.

1902–3, 1911–25, 1933: Maximum, 2,400 second-feet June 1, 1914 (gage height, 5.9 feet); minimum, 1 second-foot Sept. 19–20, 1913 (gage height, 0.25 foot).

REMARKS.—Records good. Small diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	33	545	175	34	15	16	24	668	71	19	20
2	30	668	118	33	14	17	24	668	68	19	18
3	31	774	106	31	15	18	24	668	71	19	17
4	27	668	99	28	13	19	32	890	68	23	16
5	25	890	97	28	14	20	61	440	64	20	14
6	25	975	112	24	13	21	91	1,070	64	19	13
7	25	946	214	25	14	22	108	668	61	19	13
8	24	725	163	23	14	23	93	410	48	19	13
9	24	788	122	22	14	24	97	316	47	18	13
10	24	1,090	106	22	19	25	89	651	48	18	14
11	33	1,070	108	20	22	26	93	640	48	19	14
12	24	1,110	106	20	25	27	118	331	42	26	13
13	24	925	103	26	21	28	173	274	42	27	13
14	23	855	106	24	17	29	201	274	41	22	13
15	22	788	104	20	17	30	288	219	40	18	13
						31	370		36	18	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	370	22	73.5	4,520
June	1,110	219	700	41,700
July	214	36	87.0	5,350
August	34	18	22.7	1,400
September	25	13	15.5	922
The period				53,900

LITTLE LARAMIE RIVER AT TWO RIVERS, WYO.

LOCATION.—Water-stage recorder on line between secs. 5 and 6, T. 17 N., R. W., half a mile south of old Two Rivers. Gage at same site and data as used 1911-27. Zero of gage is 7,060.54 feet above mean sea level.

DRAINAGE AREA.—310 square miles.

RECORDS AVAILABLE.—May 1911 to October 1927; May to September 1933.

DISCHARGE.—Maximum during year, 615 second-feet June 13 (gage height, feet); minimum, 0.6 second-feet Sept. 8 (gage height, 1.53 feet).

1911-27, 1933: Maximum, 1,790 second-feet May 29, 1926 (gage height, 6.32 feet); no flow at times.

REMARKS.—Records good except those for May 1-3, June 4, 5, Sept. 16, which were estimated. Diversions for irrigation above station.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1-----	10	1.0	22	3.2	3.4	16-----	3.6	506	46	1.0	
2-----	10	.9	17	3.6	2.4	17-----	3.2	428	39	1.0	
3-----	10	3.2	13	10.0	1.8	18-----	2.8	354	28	.9	
4-----	10	61	14	10.0	1.4	19-----	2.8	324	24	1.0	
5-----	10	125	15	10.0	1.1	20-----	2.4	342	18	1.0	
6-----	9.0	250	15	8.0	.9	21-----	2.4	397	14	.9	
7-----	8.0	397	21	6.4	.8	22-----	2.2	367	11	.8	
8-----	6.4	387	155	5.6	.7	23-----	3.2	330	8.5	.8	
9-----	6.8	394	192	3.8	.9	24-----	2.4	271	6.8	.8	
10-----	6.8	339	141	3.0	.8	25-----	2.0	172	6.0	.8	
11-----	7.6	394	53	2.2	2.6	26-----	1.9	132	3.8	2.6	
12-----	9.0	506	31	1.8	7.2	27-----	1.7	81	3.4	6.4	
13-----	9.0	574	19	1.5	9.0	28-----	1.6	68	3.6	10	
14-----	5.6	562	15	1.1	9.0	29-----	1.5	47	4.0	12	
15-----	4.4	514	23	1.0	5.6	30-----	1.3	37	3.8	10	
						31-----	1.2		2.8	6.8	

Month	Maximum	Minimum	Mean	Run-off acre-
May-----	10	1.2	5.12	1
June-----	574	.9	279	
July-----	192	2.8	31.2	
August-----	12	.8	4.13	
September-----	9	.7	2.22	
The period-----				1

RAWHIDE CREEK NEAR LINGLE, WYO.

LOCATION.—Staff gage in sec. 17, T. 25 N., R. 62 W., 1 mile east of Lingle and 2 miles above mouth.

DRAINAGE AREA.—510 square miles.

RECORDS AVAILABLE.—May 1928 to September 1933.

DISCHARGE.—Maximum during year, 281 second-feet May 24 (gage height, 4.26 feet); minimum, 4 second-feet May 18, 19 (gage height, 1.35 feet).

1928-33: Maximum, 340 second-feet June 2, 1929 (gage height, 5.5 feet); minimum, 3 second-feet Apr. 10, 1930 (gage height, 1.80 feet).

REMARKS.—Records fair. Discharge estimated Dec. 1 to Mar. 8 on the basis of one discharge measurement and temperature record. No diversions. Low-water flow represents return seepage from Interstate Canal.

Discharge, in second-feet, 1922-33

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	26			26	28	20	63	35	45
2	54	27			23	27	22	18	47	41
3	54	27			28	18	20	16	44	46
4	47	27			22	32	21	32	43	41
5	48	27		17	20	32	24	38	44	41
6	41	27			25	37	22	18	45	44
7	46	28			22	37	32	15	45	45
8	42	28			20	34	40	2	45	45
9	39	26		18	20	32	24	17	43	44
10	45	28		16	18	46	23	16	39	44
11	41	27		18	16	44	20	7	39	45
12	45	28		25	19	32	22	7	41	91
13	39	29		24	34	29	16	20	37	91
14	39	27		19	16	41	16	2	31	91
15	33	31		21	13	34	11	18	28	87
16	33	28		27	17	24	10	18	28	44
17	39	27		20	15	26	12	24	58	40
18	40	27		18	14	4	10	2	60	38
19	41	27		18	14	4	16	24	30	39
20	40	28		16	72	8	14	26	37	45
21	40	26	* 16	18	29	13	16	35	31	38
22	39	29		19	32	14	17	36	28	43
23	42	29		18	29	176	14	40	26	42
24	43	27		18	28	206	60	36	27	38
25	40	26		18	25	114	20	36	26	37
26	43	28		16	18	48	14	33	28	39
27	40	27		17	18	48	14	33	71	40
28	36	28		12	12	45	15	33	41	38
29	26	26		16	18	34	18	32	46	37
30	28	28		23	24	21	17	36	124	37
31	27			14		24		36	62	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	54	26	40.2	2,470
November	31	26	27.5	1,640
December			^a 18	1,110
January			^b 18	1,110
February			^b 14	778
March	27	12	18.2	1,120
April	72	12	22.9	1,360
May	206	4	42.3	2,600
June	60	10	20	1,190
July	63	7	26.7	1,640
August	124	26	42.9	2,640
September	91	37	47.9	2,850
The year	206	4	28.3	20,500

* Result of discharge measurement.

^a Estimated.

KATZER DRAIN NEAR HENRY, NEBR.

LOCATION.—Staff gage in sec. 15 (revised), T. 23 N., R. 60 W., $1\frac{1}{4}$ miles above confluence with North Platte River and 3 miles southwest of Henry.

RECORDS AVAILABLE.—June 1928 to September 1933.

DISCHARGE.—Maximum during year, about 556 second-feet May 23 (gage height, 6.00 feet); minimum not determined but occurred during winter.

1928-33: Maximum, about 1,050 second-feet June 2, 1929 (gage height, 9.9 feet); minimum, 1 second-foot Mar. 10-11, 13-16, 1929.

REMARKS.—Records fair. Discharge estimated Apr. 18-23, 23, Apr. 28 to May 5, May 7, 9, 10, 14, and those for Dec. 1 to Mar. 9, on basis of one discharge measurement and temperature records. Records show return flow from area under Fort Laramie Canal. Katzer drain enters North Platte River in Wyoming, 1 mile above Nebraska line.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	27	9	-----	7	8	8	14	25	33	62
2.....	23	10	-----		8	8	14	20	40	62
3.....	18	10	-----		8	10	19	36	41	63
4.....	12	8	-----		10	12	16	35	41	64
5.....	12	10	-----		8	12	15	41	46	57
6.....	10	8	-----	8	10	13	18	34	45	57
7.....	12	10	-----		8	12	21	26	47	57
8.....	12	12	-----		9	10	19	22	37	56
9.....	14	26	-----		13	11	27	36	37	55
10.....	12	36	-----	12	7	12	12	38	32	73
11.....	10	16	-----	8	4	14	15	29	40	73
12.....	10	10	-----	6	6	14	18	25	36	89
13.....	10	10	-----	8	8	8	20	24	36	72
14.....	10	10	* 2.6	9	6	8	20	28	45	45
15.....	8	10	-----	7	7	9	21	25	37	52
16.....	10	12	-----	6	8	8	31	24	35	46
17.....	10	12	-----	8	9	8	28	33	48	46
18.....	8	13	-----	6	9	8	36	28	37	47
19.....	12	12	-----	8	10	8	39	27	34	44
20.....	9	12	-----	10	11	8	31	30	33	39
21.....	10	13	-----	8	13	8	36	35	28	38
22.....	9	10	-----	10	12	8	34	36	30	43
23.....	10	10	-----	8	11	190	29	36	36	35
24.....	10	10	-----	8	11	21	36	42	40	42
25.....	12	10	-----	10	10	19	30	42	44	42
26.....	11	11	-----	8	10	16	30	44	47	40
27.....	10	10	-----	8	9	12	30	41	52	34
28.....	11	10	-----	8	9	9	37	33	62	31
29.....	10	11	-----	8	10	34	32	30	62	36
30.....	10	10	-----	8	10	36	28	28	55	21
31.....	10	-----	-----	8	-----	20	-----	34	48	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	27	8	11.7	719
November.....	36	8	12.0	714
December.....	-----	-----	* 6.0	369
January.....	-----	-----	* 3.0	184
February.....	-----	-----	* 4.5	250
March.....	12	6	8.0	492
April.....	13	4	9.1	541
May.....	190	8	18.5	1,140
June.....	39	12	25.2	1,500
July.....	44	20	31.8	1,960
August.....	62	28	41.4	2,550
September.....	89	21	50.7	3,020
The year.....	190	-----	18.5	13,400

* Result of discharge measurement.

† Estimated.

HORSE CREEK NEAR YODER, WYO.

LOCATION.—Water-stage recorder in sec. 13, T. 22 N., R. 62 W., 6 miles southeast of Yoder.

DRAINAGE AREA.—1,320 square miles.

RECORDS AVAILABLE.—May 1928 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 14 second-feet Aug. 5 (gage height, 2.50 feet); no flow at times.

1928-33: Maximum, 455 second-feet June 8, 1929 (gage height, 4.59 feet); no flow at times.

REMARKS.—Records poor. Discharge estimated during periods of ice effect, Dec. 21 to Feb. 25, Mar. 7-11, on basis of two discharge measurements and temperature records, Apr. 1 to May 11 by comparison with Horse Creek near Lyman. Diversions for irrigation above station. Flow regulated by Hawk Springs Reservoir, capacity 19,400 acre-feet.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	May	June	July	Aug.	Sept.
1.....	0.9	0.7	0.8	6	2	7.1	1.0	1.3	0.1	0	0.6
2.....	.7	.7	.8	7		6.7	1.0	1.3	0	0	.6
3.....	.6	.7	.8	5		5.6	1.0	1.2	0	0	.5
4.....	.6	.7	.7	5		7.2	1.1	1.1	0	0	.4
5.....	.5	.8	.8	5		5.8	1.4	1.1	0	7.3	.4
6.....	.5	.7	.6	4	1	4.4	2.0	1.0	0	2.7	.5
7.....	.4	.8	.6			3	1.6	1.0	0	2.2	.6
8.....	.5	.7	.5			2	1.8	.8	13	.9	.4
9.....	.5	.8	.7			2	2.0	.7	6.2	.6	.5
10.....	.5	.7	1.0			2	2.5	.6	4.2	.4	.7
11.....	.4	.6	.9	2	2	2	3.0	.6	1.8	.3	1.0
12.....	.4	.8	.9			2.4	2.8	.6	.8	.3	1.6
13.....	.4	1.0	.7			1.7	2.7	.5	.8	.3	1.8
14.....	.4	1.1	.9			1.9	2.5	.4	.8	.2	1.3
15.....	.4	1.0	1.0			1.6	2.4	.4	.4	.2	1.1
16.....	.4	1.0	1.0	1.5	5	1.4	2.3	.2	.4	.2	1.0
17.....	.4	1.0	1.4			1.4	2.2	.2	.2	.2	.9
18.....	.4	.9	1.9			1.3	2.2	.2	.2	.2	.9
19.....	.4	.9	1.9			1.2	2.1	.1	.1	.2	.8
20.....	.7	.9	3.1			1.2	2.0	.1	0	.2	1.0
21.....	.6	.9	7	2.1	6	1.2	2.1	.1	0	.2	1.0
22.....	.6	.8	6			1.7	2.1	.1	0	.2	1.0
23.....	.5	.9	8.8			1.6	5.3	.1	0	.2	.9
24.....	.5	.8	8			1.3	3.1	.1	0	.2	.8
25.....	.5	.8	8			1.3	2.6	.1	0	.3	.8
26.....	.5	.7	8	2	8.0	1.3	2.1	.1	0	.4	.7
27.....	.6	.8	7		7.8	1.2	2.0	.1	0	.4	.7
28.....	.6	.7	6		7.4	1.1	1.9	.1	0	.8	.6
29.....	.7	.7	6			1.1	1.7	.1	0	1.9	.6
30.....	.6	.7	6			1.0	1.7	.1	0	.8	.5
31.....	.7		6			1.0	1.7		0	.6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	0.9	0.4	0.53	33
November.....	1.1	.6	.81	48
December.....	8.8	.5	3.15	194
January.....	7.0		2.84	175
February.....	8.0		3.69	205
March.....	7.2	1.0	2.44	150
April.....			* 1.2	71
May.....	5.3	1.0	2.13	131
June.....	1.3	.1	.48	29
July.....	13	0	.90	55
August.....	7.3	0	.72	44
September.....	1.8	.4	.81	48
The year.....	13	0	1.63	1, 180

* Estimated.

HORSE CREEK NEAR LYMAN, NEBR.

LOCATION.—Staff gage in sec. 25, T. 23 N., R. 58 W., half a mile below mouth of Kiowa Drain and 3 miles northeast of Lyman.

DRAINAGE AREA.—1,860 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 1,070 second-feet May 2^d (gage height, 4.98 feet); minimum, 12 second-feet Apr. 16–19 (gage height, 1.40 feet).

1930–33: Maximum, that of May 23, 1933; minimum, that of Apr. 16–19, 1933.

REMARKS.—Records good except those for period of ice effect, Dec. 8 to Mar. 6, which are estimated on basis of six discharge measurements and temperature records, and those estimated Oct. 1, May 23, which are fair. Numerous small diversions above station.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.		
1	400	52	29	25	20	25	16	38	78	118	83	173		
2	271	25	29				14	32	78	74	78	187		
3	149	42	31				14	30	81	74	80	230		
4	121	40	29				14	123	72	96	81	196		
5	108	21	28	28	14	50	16	155	103	84	307	220		
6	83	40	29				16	198	92	80	215	77		
7	83	38	25				32	13	149	77	158	180		
8	83	40	26				• 14	63	13	169	92	166	164	83
9	83	40					71	14	198	48	131	133	94	
10	83	40					50	14	252	75	147	122	114	
11	72	42	15	• 26	14	55	14	254	65	178	107	131		
12	66	40					48	14	252	107	147	96	249	
13	66	40					32	16	313	98	110	86	512	
14	62	40					34	14	230	59	77	89	482	
15	60	38	20	25	15	28	30	14	241	58	68	86		
16	66	40					12	268	42	71	81	466		
17	56	35					• 22	25	15	286	43	78	81	504
18	51	40					28	12	158	46	80	84	411	
19	60	38	22	23	20	24	12	153	51	70	74	360		
20	62	35					26	289	40	105	65	81	319	
21	56	31					24	112	91	173	65	78	298	
22	54	33					25	107	173	201	122	81	228	
23	51	29	21	23	25	24	49	676	331	92	88	243		
24	50	33					22	40	283	363	98	83	189	
25	45	33					22	33	122	397	80	81	164	
26	50	33					24	31	55	383	78	86	194	
27	47	33	21	23	25	23	33	42	277	77	135	158		
28	52	33					32	41	120	75	153	164		
29	52	33					21	33	110	105	78	340	131	
30	45	33					• 21	20	31	91	84	81	363	141
31	40	21	21			16	55	81	353					

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	400	40	84.7	5,210
November	52	21	36.3	2,160
December	31		21.4	1,320
January			25.0	1,540
February			17.8	989
March	71	16	30.3	1,860
April	289	12	35.2	2,090
May	676	30	170	10,500
June	397	42	130	7,740
July	178	65	96.7	5,950
August	363	74	134	8,240
September	512	77	241	14,300
The year	676	12	85.5	61,900

• Result of discharge measurement.

SHEEP CREEK NEAR MORRILL, NEBR.

LOCATION.—Staff gage in sec. 16, T. 23 N., R. 57 W., 1 mile west of Morrill.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year (estimated), 200 second-feet Apr. 20 (gage height, 4.4 feet); minimum, 1.2 second-feet June 4, 11 (gage height, 1.20 feet).

1931–33: Maximum gage height, 6.75 feet, due to break in Interstate Canal, Aug. 2, 1932; (discharge not determined) minimum, 1 second-foot June 1, 7, 18, 20, 1932 (gage height, 1.12 feet).

REMARKS.—Records good except those estimated Oct. 1 to Feb. 25, which are fair, and those estimated Sept. 1–30, which are poor. During irrigation season all flow at a point $1\frac{1}{4}$ miles above station is diverted.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	125	110 • 108	100	89	90	86	73	92	60	9.0	2.8	6.0
2						86	73	80	60	6.6	3.6	
3						88	74	82	60	9.0	2.8	
4						78	74	90	1.2	2.8	3.6	
5						96	68	85	2.2	1.8	3.6	
6	122	108	95	88	80 • 68 70	94	73	82	2.8	2.2	3.2	5.6
7						93	74	88	6.6	2.2	3.2	
8						84	74	82	2.8	2.8	3.2	
9						86	76	82	1.8	2.5	3.2	
10						87	73	103	5.0	2.0	3.2	
11	• 121			• 87	75	86	73	87	1.2	2.5	3.2	20
12						86	72	87	1.8	3.2	3.2	30
13						85	71	82	2.2	2.5	3.2	40
14						86	71	83	2.2	3.2	3.2	43
15						84	73	79	2.2	2.5	2.5	50
16	120	105 • 92		92	81	88	75	79	4.2	3.2	3.2	75
17						83	72	77	2.8	3.6	2.5	
18						80	73	76	2.5	3.2	3.2	
19						80	73	76	3.2	2.8	3.2	
20						79	148	74	9.6	2.8	3.2	
21	115	100	90	• 96 96	85	79	148	73	11	2.8	3.2	130
22						86	94	73	6.0	2.8	3.2	
23						77	85	112	12	3.2	3.9	
24						78	84	79	20	2.8	3.2	
25						77	80	42	11	3.6	3.2	
26	110	• 100 100	89	93	86 85 85	77	78	38	3.2	3.6	3.2	125
27						76	79	39	7.2	3.6	4.2	125
28						77	76	33	7.2	2.8	23	125
29						77	76	29	9.0	3.6	10	
30						76	80	26	9.0	2.8	6.6	
31			• 89			77		58		3.6	6.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October			118	7,260
November			105	6,250
December			92.9	5,710
January	96	87	91.0	5,600
February		68	81.1	4,500
March	96	76	83.0	5,100
April	148	68	80.4	4,780
May	112	26	73.2	4,500
June	60	1.2	11.0	655
July	9.0	1.8	3.41	210
August	23	2.5	4.28	263
September		5.6	67.0	3,990
The year	148	1.2	67.4	48,800

• Result of discharge measurement.

WINTER CREEK NEAR SCOTTSBLUFF, NEBR.

LOCATION.—Staff gage in sec. 19, T. 22 N., R. 54 W., 1 mile east of Scottsbluff.
RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year, 176 second-feet Sept. 14 (gage height, 2.68 feet); minimum, 4 second-feet June 4, 11, 12, 17.

1931-33: Maximum, that of Sept. 14, 1933; minimum, that of June 4, 11, 12, 17, 1933.

REMARKS.—Records fair. Discharge estimated Oct. 1 to Feb. 26, June 8 to Sept. 30, by means of 6 discharge measurements and intermittent gage readings.
Divisions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	132	75	66	60	60	60	56	60	10	46	91	95
2.....						63	55	57	6	50	64	
3.....						63	54	64	6	53	* 70	
4.....						63	54	71	4	59	74	
5.....						70	52	66	7	65	74	
6.....	* 132	* 74	60	69	58	60	33	64	7	70	74	90
7.....	130				58	65	28	66	5	60	73	89
8.....	125				58	63	31	64	6	54	63	81
9.....	120				57	60	24	66	7	48	59	73
10.....	115				57	60	20	149	6	53	55	90
11.....	110	74	60	56	58	21	64	4	58	62	125	
12.....	107				59	30	56	4	* 59	* 69	150	
13.....	* 107				58	34	56	5	52	70	170	
14.....	107				* 69	57	29	55	5	90	86	176
15.....	107				69	57	23	55	5	66	73	150
16.....	100	70	65	57	57	31	60	* 5	56	60	140	
17.....					57	28	54	4	47	60	130	
18.....					57	58	24	59	9	66	60	120
19.....					57	38	60	14	84	80	118	
20.....					57	117	59	28	170	111	115	
21.....	90	* 70	62	58	57	76	60	42	117	94	110	
22.....					57	74	38	40	111	78	105	
23.....					57	66	53	37	175	* 85	* 104	
24.....					57	64	45	36	85	54	110	
25.....					57	69	49	36	80	72	115	
26.....	80	66	69	62	58	65	36	34	76	91	120	
27.....					57	58	36	33	72	126	127	
28.....					57	56	34	36	66	160	120	
29.....					57	59	34	38	60	139	115	
30.....		* 66			57	64	34	42	64	118	110	
31.....			* 69		57		* 20		69	115		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....			105	6,460
November.....			71.5	4,250
December.....			65.9	4,050
January.....			65.9	4,050
February.....			57.9	3,220
March.....	70	57	59.0	3,630
April.....	117	20	47.8	2,840
May.....	149	20	56.3	3,460
June.....	42	4	17.4	1,040
July.....	117	46	69.1	4,250
August.....	160	54	82.6	5,080
September.....	176	73	114	6,780
The year.....	176	4	67.8	49,100

* Result of discharge measurement.

GERING DRAIN NEAR GERING, NEBR.

LOCATION.—Staff gage on line between secs. 5 and 6, T. 21 N., R. 54 W., 2 miles east of Gering.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year (estimated), 800 second-feet July 5 (gage height, 7.00 feet); minimum, 17 second-feet Apr. 17 (gage height, 0.89 foot).

1930-33: Maximum, that of July 5, 1933; minimum, that of Apr. 17, 1933.

REMARKS.—Records fair. Discharge estimated Dec. 15 to Feb. 28, May 10, 11, alternate days June 7 to Aug. 31 and for Sept. 1-6, 8, 10-13, 15-18, 20-22, 24-26, 28-30.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	38	38	30	30	23	24	23	55	57	50	78
2	80	37	39			24	27	24	58	50	54	78
3	68	37	38			23	24	24	57	56	58	78
4	84	37	38			22	23	70	42	61	62	78
5	83	39	38			22	22	72	87	82	65	78
6	88	38	36	31	30	22	23	58	43	104	63	75
7	46	40	36		28	41	24	107	50	93	61	75
8	52	41	36		27	35	23	91	57	82	65	71
9	42	44	36		27	37	23	89	52	88	69	67
10	52	41	36		27	34	22	78	47	94	68	75
11	52	41	35	32	26	30	22	66	52	64	67	100
12	46	40	34			30	22	55	56	34	79	110
13	46	38	34			35	22	41	56	36	70	120
14	52	38	34			32	22	41	57	39	68	131
15	54	38	34			31	22	38	50	56	65	135
16	46	38	33	32	26	31	21	40	42	73	64	140
17	45	38				30	18	41	51	59	64	140
18	46	40				29	18	38	60	45	62	145
19	45	40				30	19	28	60	54	61	150
20	44	40				30	90	38	61	64	60	150
21	44	40	32	32	25	30	52	36	63	64	58	148
22	46	38	32			30	44	36	65	64	60	148
23	41	38	32			28	40	190	76	64	61	146
24	40	37	32			30	36	72	88	65	59	145
25	41	35	32			29	35	46	98	62	57	144
26	42	36	30	32	24	30	61	65	107	59	64	143
27	42	39			23	30	74	59	90	56	72	142
28	37	42			23	28	58	52	72	52	76	120
29	39	42			23	28	74	50	68	50	80	100
30	39	45			23	27	67	54	64	49	80	80
31	38	30	30	30	25	25	42	42	50	50	80	80

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	88	37	51.9	3,190
November	45	35	39.2	2,330
December	39		33.8	2,080
January			31.5	1,940
February		23	26.6	1,480
March	41	22	29.2	1,800
April	90	18	35.1	2,090
May	190	23	56.9	3,500
June	107	42	62.8	3,740
July	104	34	62.1	3,820
August	80	50	65.2	4,010
September	150	67	113.	6,720
The year	190	18	50.7	36,700

• Result of discharge measurement.

NINEMILE DRAIN NEAR MCGREW, NEBR.

LOCATION.—Staff gage in sec. 25, T. 21 N., R. 53 W., 1½ miles north of McGrew.
 RECORDS AVAILABLE.—January 1932 to September 1933.

DISCHARGE.—Maximum during year, 344 second-feet Sept. 14 (gage height, 2.92 feet); minimum, 83 second-feet Apr. 12, 17, 19.

1932-33: Maximum, 385 second-feet Apr. 13, 1932 (gage height, 3.08 feet); minimum, 81 second-feet May 13, 14, 1932 (gage height, 0.77 foot).

REMARKS.—Records fair. Discharge estimated Dec. 11 to Feb. 26, Mar. 5, 6, alternate days June 10 to Aug. 31, and for Sept. 1-6, 8, 10-13, 15-18, 20-22, 24-26, 28-30. Return flow from irrigated lands.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	255	167	136	115	105	99	88	89	118	150	198	225	
2.....	242	166	135			96	87	90	104	156	198		
3.....	231	167	135			94	89	87	108	161	196		
4.....	209	166	136			104	86	89	106	182	195		
5.....	209	167	135			90	84	98	104	203	196		
6.....	207	166	133	114	100	90	86	96	102	178	197	212	
7.....	209	158	132		99	110	88	98	98	166	196		
8.....	213	158	128		102	86	100	108	186	195	212		
9.....	192	155	123		101	89	100	104	220	186	212		
10.....	196	154	118		95	100	86	100	100	182	178		225
11.....	205	150	115	114	98	99	86	133	96	145	192	275	
12.....	205	150				101	83	112	99	150	205		
13.....	211	149				103	90	100	102	155	206		
14.....	194	150				108	86	96	103	172	206		
15.....	198	150				109	86	96	104	190	202		
16.....	200	149	118	112	98	107	86	92	110	182	198	280	
17.....	198	148				106	83	89	117	175	190		
18.....	200	148				107	87	87	120	178	181		
19.....	198	149				108	83	116	122	180	187		
20.....	198	148				104	143	118	140	176	193		
21.....	200	149	116	110	98	102	148	109	158	171	191	260	
22.....	202	149	116		96	120	109	148	192	189			
23.....	180	146	108		98	99	110	139	138	212	202		246
24.....	182	148				94	109	205	156	202	215		
25.....	184	146				95	102	200	175	192	234		
26.....	182	133	116	108	95	98	100	190	170	183	254	278	
27.....	180	135			94	93	95	187	166	174	294		
28.....	167	133			95	92	95	171	170	170	333		
29.....	167	135			90	91	128	175	165	322			
30.....	166	132			90	89	115	168	182	311			
31.....	164					89		123		198	300		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	255	164	198	12, 200
November.....	167	132	151	8, 980
December.....	136		121	7, 440
January.....			112	6, 890
February.....			98.6	5, 480
March.....	110	89	99.2	6, 100
April.....	148	83	94.7	5, 640
May.....	205	87	118	7, 260
June.....	175	96	126	7, 500
July.....	220	145	178	10, 900
August.....	333	178	217	13, 300
September.....	344	212	254	15, 100
The year.....	344	83	148	107, 000

• Result of discharge measurement.

BAYARD SUGAR FACTORY DRAIN NEAR BAYARD, NEBR.

LOCATION.—Staff gage in sec. 4, T. 20 N., R. 52 W., $1\frac{1}{4}$ miles southwest of Bayard.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year, 115 second-feet July 4 or 5 (gage height, 2.20 feet); minimum, 5 second-feet June 18 (gage height, 0.40 foot).

1931-33: Maximum, that of July 4 or 5, 1933; minimum, 4 second-feet June 9, 1932 (gage height, 0.38 foot).

REMARKS.—Records good Oct. 1 to June 6; poor June 7 to Sept. 37. Discharge estimated Oct. 10, Dec. 11, 12, Dec. 16 to Mar. 8, May 1-4, alternate days June 7 to Aug. 29, Aug. 30 to Sept. 6, Sept. 8, 10-13, 15-18, 20-26, 28-30. Some diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	57	50				33		34	30	34	
2	92	57	50				33		38	46	36	
3	96	57	50	46	42	40	33	32	37	37	39	
4	96	54	50				32		37	28	40	
5	96	57	50			35	31	37	46	55	42	62
6												
7	96	57	50		40	35	31	37	38	82	42	
8	84	57	50	45	35	38	31	37	44	58	41	62
9	88	54	46			38	31	37	51	33	40	62
10	84	54	46	• 45		39	30	36	42	42	39	61
11	80	57	46		35	44	31	38	33	50	39	62
12												
13	88	54	45	45		40	31	46	22	30	39	
14	88	54	45			38	31	37	12	10	41	90
15	88	57	46			42	30	37	10	13	43	
16	88	54	46			38	30	35	8	11	40	99
17	88	54	46			37	31	35	8	16	42	90
18					38							
19	80	57		44		37	31	35	7	21	40	
20	68	57				38	30	34	6	24	37	85
21	64	57				38	28	34	5	28	38	
22	64	57	48			34	29	34	6	24	39	82
23	64	54				34	65	36	8	19	44	
24												
25	64	50			• 40	36	56	36	10	20	49	
26	64	50	• 48			39	42	37	11	20	54	
27	60	54		42		36	36	43	14	25	58	82
28	60	54	48			37	34	42	16	30	56	
29	60	57		• 42	40	34	31	48	15	26	63	
30												
31	57	57				34	30	49	14	23	72	
32	57	56				33	30	46	14	14	80	• 82
33	57	54				34	28	49	15	15	70	
34	54	54	47	42		37	29	48	14	17	61	80
35	57	50										
36						34	28	48	13	19		
37	57					34		49		26	61	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	100	54	75.5	4,640
November	57	50	55.1	3,280
December	50	45	47.7	2,930
January			43.9	2,700
February			38.8	2,150
March	44	33	37.2	2,290
April	65	28	33.2	1,980
May	49		39.0	2,400
June	51	5	20.9	1,240
July	82	10	28.8	1,770
August	80	34	47.7	2,930
September	99		77.0	4,580
The year	100	5	45.4	32,900

• Result of discharge measurement.

RED WILLOW CREEK NEAR BAYARD, NEBR.

LOCATION.—Staff gage at southwest corner of sec. 7, T. 20 N., R. 51 W., a quarter of a mile below mouth of Wild Horse Drain, three-quarters of a mile above mouth of creek, and $4\frac{1}{2}$ miles southeast of Bayard.

RECORDS AVAILABLE.—February 1932 to September 1933. October 1930 to September 1931 at station 1 mile upstream, above mouth of Wild Horse Drain.

DISCHARGE.—Maximum during year, about 1,650 second-feet Aug. 25 (gage height, 6.4 feet); minimum, 33 second-feet June 13 (gage height, 0.36 foot).

1932-33: Maximum, that of Aug. 25, 1933; minimum, that of June 13, 1933.

REMARKS.—Records good Oct. 1 to Apr. 30, poor May 1 to Sept. 30. Discharge estimated Oct. 6, 18, 24, 26, 28, Nov. 13, 15, 24, Dec. 8, 11, 12, Dec. 16 to Feb. 26, Mar. 4-7, 31, Apr. 4, 15, 19, 30, May 6, 7, 10, 11, alternate days June 6 to Aug. 31, and Sept. 1-30. Numerous small diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	152	116	92	82	72	63	61	59	61	67	94	250
2.....	152	116	92			61	59	56	61	67	108	
3.....	138	116	92			63	59	59	63	67	107	
4.....	130	110	92			60	58	68	71	76	106	
5.....	145	116	87			60	57	67	54	86	110	
6.....	160	110	87	81	70	60	59	65	46	80	107	188
7.....	130	103	92		70	59	62	39	75	105		
8.....	130	103	90		67	58	60	38	85	103		
9.....	123	110	87		63	56	62	37	77	104		
10.....	130	103	82		67	56	63	36	75	106		
11.....	130	103	80	80	70	63	56	65	36	73	96	155
12.....	130	103	80		66	55	66	34	72	87		
13.....	130	103	87		67	55	64	33	72	86		
14.....	130	103	87		67	55	59	38	82	85		
15.....	123	103	86		65	55	59	44	92	82		
16.....	130	103	85	78	68	65	55	59	39	89	78	150
17.....	130	103				65	54	59	34	86	82	
18.....	130	103				63	54	59	43	83	85	
19.....	130	103				60	54	55	52	80	118	
20.....	130	98				63	99	63	58	79	151	
21.....	123	98	84	75	67	63	93	134	63	78	120	160
22.....	130	98	84		66	63	74	162	64	75	89	
23.....	123	98	84		64	63	67	176	64	71	92	
24.....	130	95				64	63	270	56	72	96	
25.....	138	92				64	63	323	65	73	260	
26.....	127	92	83	75	63	64	61	294	65	76	575	200
27.....	116	98			62	63	59	266	65	79	400	
28.....	116	92			63	64	57	264	66	78	352	
29.....	116	92			64	64	57	220	66	78	344	
30.....	116	92			62	62	58	110	66	80	337	
31.....	116	-----	-----	-----	-----	62	-----	89	-----	81	325	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	160	116	130	7,990
November.....	116	92	102	6,070
December.....	92	80	85.7	5,270
January.....	-----	-----	78.4	4,820
February.....	-----	-----	68.4	3,800
March.....	70	60	63.7	3,920
April.....	99	54	60.9	3,620
May.....	323	55	114	7,010
June.....	71	33	51.9	3,090
July.....	92	67	77.5	4,770
August.....	575	78	161	9,900
September.....	-----	140	181	10,800
The year.....	575	33	98.2	71,100

* Result of discharge measurement.

PUMPKIN CREEK NEAR BRIDGEPORT, NEBR.

LOCATION.—Staff gage on line between secs. 12 and 13, T. 19 N., R. 50 W., at highway bridge half a mile above mouth and 4 miles southeast of Bridgeport.

DRAINAGE AREA.—1,080 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 162 second-feet Aug. 28 (gage height, 3.6 feet, estimated); minimum, 6 second-feet Aug. 2, 24.

1930-33: Maximum (estimated), 200 second-feet June 16, 1932 (gage height, 3.78 feet); minimum, 1 second-foot several days during 1931.

REMARKS.—Records poor. Discharge estimated Dec. 6 to Feb. 2⁷, Mar. 5, 6, Apr. 30, alternate days June 7 to Aug. 31, Sept. 1-28, 30. Discharge represents chiefly return seepage flow. Several diversions above station for irrigation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	13	25	25			40	43	46	30	16	8	
2.....	13	25	24			40	40	48	28	16	6	
3.....	13	25	24		40	40	40	52	28	15	16	
4.....	13	25	24			40	40	32	22	20	26	
5.....	13	25	24			40	40	38	19	24	25	
6.....	13	26	24	42		40	43	32	18	20	24	40
7.....	13	27				52	43	34	15	15	16	
8.....	13	27			35	52	26	44	12	18	8	
9.....	19	27				52	26	48	12	21	8	
10.....	19	27				52	26	54	12	9	8	
11.....	19	27	20									
12.....	19	27		• 42	• 44	42	27	52	14	10	8	
13.....	19	27		45		42	26	54	16	8	8	• 38
14.....	19	34				42	27	52	15	7	8	
15.....	19	34		• 47		42	27	48	18	7	8	
16.....	19	34				42	27	48	20	7	8	38
17.....	19	34	30	45	42	42	32	42	20	14	8	
18.....	19	34				42	34	42	21	20	9	
19.....	19	35				52	30	40	25	19	10	
20.....	19	35				52	20	38	29	19	10	
21.....	23	36				52	23	36	22	20	11	37
22.....	23	36	40	40								
23.....	23	32			41	52	25	35	16	20	25	
24.....	23	32	• 40		• 41	52	28	36	14	16	39	• 37
25.....	23	28				52	30	42	12	12	22	38
26.....	27	28		36		42	32	39	12	19	6	
27.....	27	28				42	42	37	11	26	14	38
28.....	27	27	40	• 36	41	42	38	19	12	26	21	
29.....	27	27				42	48	42	12	26	30	42
30.....	27	25				42	35	52	14	23	76	
31.....	25	25		36		42	30	46	17	20	65	45
						43	38	42	16	16	52	45
						43		36		11	50	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	27	13	19.8	1,220
November.....	36	25	29.2	1,740
December.....			30.8	1,890
January.....			40.6	2,500
February.....			40.2	2,230
March.....	52	40	44.9	2,760
April.....	45	20	32.9	1,960
May.....	54	19	42.1	2,590
June.....	30	11	17.7	1,050
July.....	26	7	16.8	1,030
August.....	76	6	20.4	1,250
September.....	45		39.5	2,350
The year.....	76	6	31.2	22,600

• Result of discharge measurement.

BLUE CREEK NEAR LEWELLEN, NEBR.

LOCATION.—Staff gage on north line of sec. 30, T. 16 N., R. 42 W., $1\frac{1}{2}$ miles west of Lewellen.

DRAINAGE AREA.—267 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 296 second-feet Aug. 26; maximum gage height, 4.06 feet (ice effect) Mar. 7; minimum, 0.2 second-foot July 3, 29–31.

1930–33: Maximum, 310 second-feet Apr. 24, 1932; maximum gage height, that of Mar. 7, 1933; minimum, that of July 3, 29–31, 1933.

REMARKS.—Records fair except those estimated, Dec. 7 to Feb. 28, Mar. 4–7, June 14, 16, on alternate days June 28 to Aug. 29, and Sept. 1–5, 13, which are poor. Several diversions upstream.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	39	110	105	135	120	138	131	140	51	0.7	16	115
2.....	39	110	105			138	128	112	44	.4	64	110
3.....	36	110	105			138	114	118	42	.2	52	105
4.....	36	110	100			130	114	156	33	.3	40	100
5.....	43	110	100	• 135		100	104	160	32	13	40	95
6.....	45	110	105	135	100	100	109	139	10	12	41	89
7.....	54	105	100			175	108	145	10	12	37	91
8.....	70	100	90			191	97	134	16	22	33	80
9.....	74	100				145	111	156	13	31	30	76
10.....	79	105				140	96	170	7	18	28	47
11.....	89	94	80	130	110	145	86	166	12	6	16	39
12.....	89	100				153	85	152	29	3	3	91
13.....	89	105				120	148	82	138	30	.7	45
14.....	89	110				• 120	144	89	128	32	.7	87
15.....	89	100				120	140	96	127	34	.7	64
16.....	79	105	90	125	125	143	86	120	23	.7	40	94
17.....	79	105				140	77	126	12	.7	37	82
18.....	74	105				139	63	127	12	.6	34	128
19.....	74	105				131	64	120	.4	.4	32	84
20.....	105	105				127	174	120	.7	.4	31	82
21.....	100	110	120	123	130	130	285	114	31	.4	28	86
22.....	100	105				145	190	111	4	.7	25	89
23.....	110	105				144	143	116	.8	1	30	90
24.....	105	105				145	135	134	.8	.7	35	91
25.....	105	105				143	114	128	3	.4	160	91
26.....	105	100	130	• 123	135	139	110	97	1	.4	285	96
27.....	105	105				135	118	90	.5	.4	257	103
28.....	105	105				139	118	89	.5	.3	229	100
29.....	105	105				136	116	81	.5	.2	174	99
30.....	105	105		123		135	151	74	.6	.2	120	95
31.....	110					126		73		.2	118	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	110	36	81.5	5,010
November.....	110	94	105	6,250
December.....			106	6,520
January.....			128	7,870
February.....			120	6,660
March.....	191	100	139	8,550
April.....	285	63	116	6,900
May.....	170	73	125	7,690
June.....	51	.4	16.2	964
July.....	31	.2	4.14	255
August.....	285	3	72.0	4,430
September.....	128	39	91.2	5,430
The year.....	285	.2	92.0	66,500

• Result of discharge measurement.

OTTER CREEK NEAR LEMOYNE, NEBR.

LOCATION.—Staff gage in sec. 9, T. 15 N., R. 40 W., 600 feet above mouth and 6 miles northwest of Lemoyne. Prior to Apr. 10, 1932, staff gage 300 feet downstream with 1.31 feet lower datum.

RECORDS AVAILABLE.—April to September 1931; October 1932 to September 1933.

DISCHARGE.—Maximum during year, 46 second-feet Mar. 1; maximum gage height, 3.32 feet (ice effect) Mar. 5; minimum, 5 second-feet June 22 (gage height, 0.78 foot).

1931, 1933: Maximum, that of Mar. 1, 1933; minimum, 3 second-feet Aug. 6, 1931.

REMARKS.—Records poor. Discharge estimated Dec. 10 to Feb. 28, Mar. 5, 6, May 3-5, on alternate days June 7 to Aug. 31, and Sept. 1-30. Small diversions upstream.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	28	24	29	28	45	24	26	20	9	23	26
2	26	28	24			42	24	26	17	10	22	
3	26	28	24			36	25	26	17	9	21	
4	28	28	24			32	23	27	16	14	22	
5	30	28	24	• 29		25	24	28	16	18	22	
6	30	28	24	29	15	20	24	28	19	22	22	25
7	30	27	26			19	24	28	20	22	22	
8	30	26	16			30	26	29	20	23	22	
9	31	25	15			40	24	32	19	24	22	
10	31	25				36	25	31	18	24	22	
11	31	23	15		20	30	26	36	20	24	22	24
12	32	24				28	26	33	21	24	22	
13	29	26				27	26	32	21	24	23	
14	25	26				27	26	30	24	24	22	
15	30	26	20		• 24	28	26	30	23	23	22	• 24
16	29	25	24	30	30	26	25	28	22	22	22	28
17	28	26				25	25	27	22	20	22	
18	27	26				25	25	25	23	19	20	
19	27	26				25	25	26	22	18	18	
20	28	26				26	26	24	22	18	20	
21	28	26	26	31	35	26	28	24	13	20	21	33
22	29	24				28	30	23	5	21	22	
23	30	25				28	30	23	6	21	22	
24	30	25				27	30	23	7	21	21	
25	30	24				27	30	23	7	22	20	30
26	29	24	28	30	40	26	29	18	7	22	22	28
27	29	24				26	29	20	8	22	24	
28	28	24				26	28	23	8	22	25	
29	28	24				26	28	23	8	22	26	
30	28	24				24	29	22	8	22	27	
31	28					25		20		22	28	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	32	25	28.8	1,770
November	28	23	25.6	1,520
December			23.4	1,440
January			29.9	1,840
February			27.6	1,530
March	45	19	28.4	1,750
April	35	23	26.3	1,560
May	36	18	26.3	1,620
June	24	5	16.0	952
July	24	9	20.3	1,250
August	28	18	22.3	1,370
September	33		27.0	1,610
The year	45	5	25.1	18,200

• Result of discharge measurement.

BIRDWOOD CREEK NEAR HERSHEY, NEBR.

LOCATION.—Staff gage in sec. 2, T. 14 N., R. 33 W., 1 mile above mouth and 5 miles northwest of Hershey.

DRAINAGE AREA.—286 square miles.

RECORDS AVAILABLE.—January 1931 to September 1933.

DISCHARGE.—Maximum during year, 350 second-feet Apr. 21 (gage height, 2.80 feet); minimum, 102 second-feet June 25 (gage height, 2.18 feet).

1931-33: Maximum, that of Apr. 21, 1933; minimum, 87 second-feet Aug. 25, 1932 (gage height, 2.06 feet).

REMARKS.—Records fair. Discharge estimated Oct. 1-6, Dec. 7 to Feb. 28, on alternate days June 7 to Aug. 31, Sept. 2-30. Small diversions upstream.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	170	199	184	190	185	223	188	188	147	112	179	170
2.....		199	184			223	195	203	141	118	235	170
3.....		199	181			219	184	311	141	123	219	
4.....		203	184			219	184	227	128	123	203	
5.....		195	181			223	184	227	134	123	213	
6.....	165	203	178	190	160	215	181	188	134	135	223	160
7.....	164	178	175			223	181	227	150	147	206	
8.....	160	184				219	184	192	271	147	188	
9.....	160	184				211	178	255	160	147	196	
10.....	160	184				211	174	271	138	160	203	
11.....	160	192	170	170	170	203	150	293	164	259	188	200
12.....	160	184				203	178	231	181	174	174	
13.....	160	184				207	184	211	168	138	172	
14.....	164	188				211	181	211	154	178	170	
15.....	160	188				203	211	195	141	219	167	
16.....	160	188	175	175	175	203	215	178	139	196	164	185
17.....	160	188				203	207	188	134	174	157	
18.....	160	184				203	178	174	131	158	150	
19.....	164	188				167	174	167	128	141	150	
20.....	160	184				164	293	160	138	138	150	
21.....	160	188	185	188	185	178	335	154	147	128	167	174
22.....	223	192				203	219	144	127	184	184	
23.....	211	195				195	211	243	107	239	188	
24.....	211	188				211	184	181	104	200	192	
25.....	219	184				188	184	195	102	160	196	
26.....	211	184	188	188	200	181	184	188	104	181	199	165
27.....	192	178				184	192	188	107	160	188	
28.....	195	178				181	195	174	110	144	178	
29.....	203	184				184	188	154	112	128	174	
30.....	211	192				184	188	154	112	126	170	
31.....	199					184		160		123	170	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	223	160	177	10,900
November.....	203	178	189	11,200
December.....			180	11,100
January.....	194		189	11,600
February.....			177	9,830
March.....	223	164	201	12,400
April.....	335	150	196	11,700
May.....	311	144	201	12,400
June.....	271	102	138	8,210
July.....	259	112	158	9,720
August.....	235	150	184	11,300
September.....			174	10,400
The year.....	335	102	180	131,000

• Result of discharge measurement.

SOUTH PLATTE RIVER NEAR LAKE GEORGE, COLO.

LOCATION.—Water-stage recorder in NW¼ sec. 21, T. 13 S., R. 72 W., 1½ miles below Elevenmile Canyon Reservoir and 8 miles above Lake George. Zero of gage is 8,423.95 feet above mean sea level.

DRAINAGE AREA.—929 square miles.

RECORDS AVAILABLE.—October 1929 to September 1933.

DISCHARGE.—Maximum during year, 592 second-feet June 13 (gage height, 3.54 feet); minimum not determined.

1929-33: Maximum, 990 second-feet Aug. 15, 1930 (gage height, 4.8 feet); no flow Jan. 25, 1930, and during February 1931.

REMARKS.—Records good except those for Dec. 6 to May 16, which were based on estimates at Elevenmile Canyon Reservoir. Diversions for irrigation above station. Flow regulated by Antero and Elevenmile Canyon Reservoirs, capacities 33,000 acre-feet and 80,000 acre-feet, respectively.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Mar.	May	June	July	Aug.	Sept.
1.....	43	11	7	-----	14	8	103	57	34
2.....	43	12	4	-----		45	103	82	35
3.....	34	12	4	-----		241	62	84	35
4.....	33	12	4	-----		134	45	117	35
5.....	33	12	4	-----		50	191	209	34
6.....	38	12	4	-----	7	136	254	168	31
7.....	42	12		-----		186	269	122	32
8.....	35	18		-----		183	313	74	29
9.....	35	7		-----		52	350	74	30
10.....	35	4		-----		28	170	87	30
11.....	39	5	4	-----	3	50	23	108	112
12.....	45	4		-----		106	14	108	254
13.....	28	4		-----		324	49	106	191
14.....	26	4		-----		303	55	66	160
15.....	25	4		-----		300	14	33	181
16.....	24	4	-----	• 1	4	241	21	19	97
17.....	24	4			11	261	72	26	65
18.....	25	4			11	248	170	29	73
19.....	27	4			11	115	173	28	73
20.....	27	5			10	235	92	43	41
21.....	30	4	3	-----	8	280	60	66	40
22.....	34	4		-----	9	347	191	78	73
23.....	34	6		-----	9	212	240	81	84
24.....	35	6		-----	6	225	103	81	61
25.....	37	6		-----	6	156	63	50	39
26.....	31	6	-----	-----	6	103	63	35	30
27.....	11	5	-----	-----	6	103	63	35	31
28.....	11	5	-----	-----	6	103	63	35	31
29.....	11	7	-----	-----	7	73	73	35	33
30.....	12	9	-----	-----	8	78	73	35	33
31.....	12	-----	-----	-----	8	-----	64	34	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	45	11	29.6	1,820
November.....	18	4	7.1	422
December.....	7	-----	3.6	221
January.....	-----	-----	4 1.5	92
February.....	-----	-----	4 1.0	56
March.....	-----	-----	4 3.0	184
April.....	-----	-----	4 30.6	1,820
May.....	-----	-----	7.9	486
June.....	347	8	164	9,760
July.....	350	14	117	7,190
August.....	209	19	71.1	4,370
September.....	254	29	67.6	4,020
The year.....	350	-----	42.1	30,400

• Result of discharge measurement.

4 Estimated.

SOUTH PLATTE RIVER AT SOUTH PLATTE, COLO.

LOCATION.—Water-stage recorder in sec. 25, T. 7 S., R. 70 W., at South Platte, 375 feet below mouth of North Fork of South Platte River. Zero of gage is 6,078.43 feet above mean sea level.

DRAINAGE AREA.—2,550 square miles.

RECORDS AVAILABLE.—March 1902 to September 1933.

DISCHARGE.—Maximum during year, 2,080 second-feet June 2 (gage height, 5.92 feet); minimum not determined but occurred during winter.

1902-33: Maximum, 6,320 second-feet June 7, 1921 (gage height, 8.95 feet); minimum, 14 second-feet Mar. 11, 1932.

REMARKS.—Records fair. Discharge estimated Dec. 8 to Apr. 27 on basis of five discharge measurements and flow of South Platte at Waterton and diversions at Intake. Diversions for irrigation above station. Flow regulated by Cheesman Reservoir, capacity 79,000 acre-feet.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	204	115	48	36	58	152	716	1,510	498	503	305
2	204	223	112					824	1,640	475	552	266
3	213	226	112					850	1,150	557	557	288
4	226	206	112					870	1,200	656	326	288
5	226	223	115					863	1,350	603	295	396
6	287	228	103	55	28	60	179	964	1,330	613	592	369
7	239	204	96					919	1,330	1,060	508	354
8	201	187	42					980	1,130	972	518	354
9	206	194	30					972	1,180	1,010	417	430
10	213	206	38					863	1,270	1,080	522	645
11	250	170	62	59	29	75	110	919	1,120	804	518	447
12	256	147						912	1,020	603	438	413
13	223	148						850	1,170	572	409	333
14	221	172						811	1,470	537	400	366
15	204	156						780	1,460	666	479	322
16	187	158	63	52	38	67	180	891	1,400	527	461	266
17	185	176						1,160	1,400	489	484	236
18	185	179						1,510	1,290	466	508	223
19	187	179						1,710	1,310	552	592	218
20	181	179						1,650	1,230	547	466	207
21	176	172	55	48	42	81	127	1,740	1,300	598	396	197
22	176	192						1,850	1,200	430	421	197
23	183	168						1,540	1,290	447	425	190
24	201	147						1,510	1,160	577	421	183
25	287	154						1,330	980	547	377	176
26	226	154	47	46	48	136	300	1,300	972	326	351	174
27	303	158					400	1,350	824	282	351	176
28	309	164					508	1,370	733	282	366	171
29	271	164					733	1,280	672	305	392	167
30	268	114					716	1,380	592	302	326	183
31	265							1,540		377	305	
Month	Maximum						Minimum		Mean		Run-off in acre-feet	
October	309						176		225		13,800	
November	228						114		178		10,600	
December	115						30		66.4		4,080	
January									50.8		3,120	
February									36.5		2,030	
March									82.5		5,070	
April							733		212		12,600	
May							1,850		1,170		71,900	
June							1,640		1,190		70,800	
July							1,080		282		35,200	
August							592		265		27,100	
September							645		167		17,000	
The year	1,850								377		273,000	

• Result of discharge measurement.

• Estimated.

SOUTH PLATTE RIVER AT JULESBURG, COLO.

LOCATION.—Water-stage recorder in sec. 33, T. 12 N., R. 44 W., half a mile east of Julesburg and 4 miles above State line.

DRAINAGE AREA.—20,600 square miles.

RECORDS AVAILABLE.—April 1902 to November 1906; May 1908 to September 1914; October 1930 to September 1933. Records October 1914 to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, 659 second-feet May 13; minimum, 20 second-feet July 1, 3.
1902-33: Maximum, 30,800 second-feet June 16, 1921; no flow Aug. 18-20, 1902.

REMARKS.—Records good. They represent the amount passing the State line. Numerous diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1	22	67	121	123	299	357	52	117	121	20	27	470
2	22	67	118	142	254	324	52	84	92	21	27	481
3	22	96	117	144	278	307	53	115	84	20	27	482
4	27	82	112	163	265	301	51	159	74	21	27	490
5	25	77	116	165	249	310	46	183	65	21	27	399
6	25	80	120	186	224	380	43	184	61	20	25	323
7	26	77	124	206	270	285	44	183	60	29	23	253
8	30	108	101	208	327	270	42	183	69	29	43	169
9	32	98	88	229	353	473	43	223	65	55	250	134
10	33	88	85	212	316	427	43	222	52	538	149	116
11	33	103	85	216	308	405	44	337	52	160	77	107
12	33	123	84	237	330	385	44	495	52	97	61	130
13	32	119	94	247	343	376	44	659	52	72	50	151
14	32	112	94	270	301	345	44	584	53	57	45	126
15	32	113	168	287	348	313	43	559	50	51	34	151
16	33	112	148	290	446	311	44	515	49	55	31	186
17	31	117	128	278	547	304	44	473	45	49	29	305
18	35	117	125	302	505	290	37	440	42	44	28	437
19	41	118	152	324	492	271	37	409	36	41	23	462
20	48	112	103	306	480	269	45	373	29	33	25	351
21	48	111	119	308	432	232	65	342	28	33	25	280
22	47	111	105	310	402	215	81	312	42	31	29	232
23	54	113	137	309	402	182	80	260	39	32	27	205
24	56	108	139	280	390	153	79	363	36	30	33	172
25	50	110	126	298	392	142	93	302	34	31	33	152
26	50	110	127	272	279	111	64	271	32	30	67	143
27	49	117	146	312	390	92	44	304	29	28	72	146
28	54	117	147	250	376	80	54	281	28	27	224	143
29	47	119	150	231	-----	76	55	251	28	23	437	139
30	49	119	152	291	-----	65	89	207	25	23	528	135
31	63	-----	153	250	-----	57	-----	163	-----	23	529	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	63	22	38.1	2,340
November	123	67	104	6,190
December	168	84	122	7,500
January	324	123	247	15,200
February	547	224	361	20,000
March	473	57	262	16,100
April	93	37	53.3	3,170
May	659	84	308	18,900
June	121	25	50.8	3,020
July	538	20	56.3	3,460
August	529	23	57.8	6,010
September	490	107	249	14,800
The year	659	20	101	117,000

SOUTH PLATTE RIVER AT OGALLALA, NEBR.

LOCATION.—Staff gage in sec. 6, T. 13 N., R. 38 W., half a mile south of Ogallala.

DRAINAGE AREA.—23,500 square miles.

RECORDS AVAILABLE.—January 1931 to September 1933.

DISCHARGE.—Maximum during year not determined; no flow Aug. 20–24.

REMARKS.—Records poor. Gage read every other day June 6 to Aug. 31; discharge estimated for intervening days. Numerous diversions for irrigation above station.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								118	149	8	24	357
2								106	144	7	26	
3								106	110	6	26	
4								181	88	70	26	
5				273				181	86	135	26	
6								181	68	92	26	
7								212	70	50	30	
8			61					212	72	40	33	339
9								212	65	30	31	
10								272	58	36	28	
11								295	56	42	25	
12							63	433	55	38	22	
13								645	41	34	33	
14					214	539		758	27	30	44	
15								758	22	27	32	180
16								720	20	28	21	
17								608	18	30	20	
18								608	16	28	18	
19								532	14	27	9	
20								464	22	25	0	
21								433	30	25	0	
22								374	28	44	0	395
23								290	25	64	0	
24								290	16	54	0	
25								374	6	45	4	
26		72						336	6	40	9	
27				374				276	6	36	136	
28								336	6	30	264	
29	23							285	6	24	217	
30								252	7	22	170	
31								208		21	264	
Month	Maximum						Minimum		Mean		Run-off in acre-feet	
October									15		922	
November									50		2,980	
December									100		6,150	
January									320		19,700	
February									300		16,700	
March									350		21,500	
April									90		5,360	
May							758		106		357	
June							149		6		44.6	
July							135		6		38.3	
August							264		0		50.5	
September									310		18,400	
The year									0		168	

NOTE.—Monthly discharge October to April and September based on 12 discharge measurements and comparison with records for South Platte River at Julesburg, Colo., and North Platte, Nebr.

SOUTH PLATTE RIVER AT NORTH PLATTE, NEBR.

LOCATION.—Staff gage in sec. 9, T. 13 N., R. 30 W., three-quarters of a mile south of North Platte.

DRAINAGE AREA.—24,300 square miles.

RECORDS AVAILABLE.—June 1914 to September 1915; August 1931 to September 1933. Records 1915 to 1931 published by State engineer.

DISCHARGE.—Maximum during year, 823 second-feet Sept. 12 (gage height, 2.40 feet); no flow Oct. 1 to Jan. 17, June 25 to Aug. 5.

1914-33: Maximum, 22,000 second-feet June 13, 1921; frequently no flow during summer.

REMARKS.—Records roughly approximate.

Discharge, in second-feet, 1932-33

Day	Jan.	Feb.	Mar.	Apr.	May	June	Aug.	Sept.
1.....	0	200	425	40	104	57	0	80
2.....	0				83	113	0	120
3.....	0				128	113	0	155
4.....	0				409	83	0	194
5.....	0				409	66	0	195
6.....	0	100	475	22	409	51	10	200
7.....	0				289	40	20	200
8.....	0				202	54	23	200
9.....	0				268	72	26	200
10.....	0				526	28	22	200
11.....	0	75	529	40	381	24	17	500
12.....	0				451	75	20	823
13.....	0				381	42	23	542
14.....	0				247	32	20	332
15.....	0				576	26	17	258
16.....	0	65	500	75	658	17	15	194
17.....	0	100			658	5	12	161
18.....	100	200			493	4	12	144
19.....	200	300			493	3	13	144
20.....	275	400			353	3	9	60
21.....	295	450	300	90	353	3	5	161
22.....					247	1	14	232
23.....					268	1	23	232
24.....					232	1	24	268
25.....					210	0	26	232
26.....	295	150	75	90	210	0	32	232
27.....					247	0	39	232
28.....					247	0	48	210
29.....					232	0	57	161
30.....					210	0	51	161
31.....					75	172	45	
Month			Maximum	Minimum	Mean		Run-off in acre-feet	
January.....				0	123		7,560	
February.....					23 ⁴		13,000	
March.....				75	371		22,800	
April.....				22	45.6		2,710	
May.....			658	82	327		20,100	
June.....			114	0	37.5		1,810	
August.....			57	0	27.1		1,240	
September.....			823	60	23 ⁴		13,900	
The period.....			823	0	115		83,100	

NOTE.—No flow during months omitted.

NORTH FORK OF SOUTH PLATTE RIVER AT SOUTH PLATTE, COLO.

LOCATION.—Water-stage recorder in sec. 25, T. 7 S., R. 70 W., a third of a mile above South Platte. Zero of gage is 6,090.55 feet above mean sea level.

DRAINAGE AREA.—484 square miles.

RECORDS AVAILABLE.—June 1909 to September 1910; April 1913 to September 1933.

DISCHARGE.—Maximum during year (estimated), 1,240 second-feet May 23; minimum, 4 second-feet Dec. 8 (discharge measurement).

1909-10, 1913-33: Maximum, 1,910 second-feet June 8, 1921 (gage height, 5.9 feet); minimum, that of Dec. 8, 1932. Average, 21 years (1909-10, 1913-33), 180 second-feet.

REMARKS.—Records good except those for Nov. 10, 14-15, Nov. 25 to Apr. 4, which were estimated on basis of four discharge measurements and temperature records, and those estimated Apr. 27, May 20-25, July 1-4, which are fair. Minor diversions above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	54					30	371	1,100	300	175	79
2	72	60					32	477	1,130	270	224	76
3	68	64					37	480	848	220	264	73
4	76	60					45	452	840	190	230	71
5	78	52					39	434	930	170	180	69
6	65	59		* 21			36	506	892	199	178	70
7	67	56					46	509	856	376	183	68
8	49	42	* 4				48	525	676	433	196	67
9	62	42				* 39	49	506	660	354	160	99
10	68	35					46	467	744	347	148	412
11	70	27					32	461	768	320	138	347
12	68	29					35	425	720	327	126	289
13	64	40					35	389	776	286	115	213
14	60	38			* 12		30	374	720	260	105	199
15	56	38					35	371	664	276	106	186
16	56	39					46	422	652	276	163	146
17	57	51					54	550	644	280	188	126
18	59	56					54	700	606	248	186	117
19	64	60					70	837	553	210	207	115
20	56	56					96	940	564	193	204	110
21	72	48					83	1,060	520	180	183	105
22	67	45					43	1,200	494	173	173	105
23	65	39					59	1,240	502	163	165	105
24	75	29					87	1,130	484	165	153	104
25	52	28					94	1,020	466	151	104	102
26	59	26					116	896	448	142	81	102
27	82	26					175	980	412	134	92	106
28	80	26					218	1,010	386	126	102	105
29	73	24					324	1,010	365	121	96	99
30	67	24					335	1,040	351	113	86	98
31	60							1,110		134	81	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	82	49	65.5	4,030
November	64	24	42.4	2,520
December			18	1,110
January			20	1,230
February			17	944
March			36	2,210
April	335	30	81	4,820
May	1,240	371	706	43,400
June	1,130	351	659	39,200
July	433	113	230	14,100
August	264	81	155	9,530
September	412	67	132	7,860
The year	1,240		181	131,000

* Result of discharge measurement.

^b Estimated.

THOMPSON RIVER BELOW POWER HOUSE NEAR DRAKE, COLO.

LOCATION.—Water-stage recorder in NW¼ sec. 7, T. 5 N., R. 70 W., a quarter of a mile below city of Loveland's hydroelectric plant and 4½ miles east of Drake. Cedar Creek enters an eighth of a mile downstream.

DRAINAGE AREA.—277 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933. Comparable record at site 3 miles upstream from September 1917 to December 1926.

DISCHARGE.—Maximum during year, 1,010 second-feet June 14 (gage height, 4.08 feet); minimum, 1.6 second-feet (seepage when gates at power plant are shut and water is being stored).

1928-33: Maximum, that of June 14, 1933; minimum, 1.4 second-feet at various times.

Maximum discharge known, 8,000 second-feet July 31, 1919. Average, 14 years (1917-26, 1928-33), 193 second-feet.

REMARKS.—Records excellent except those estimated Oct. 19, 25-26, Nov. 13, 14, Dec. 7-23, Jan. 19-22, Feb. 6-10, 13, Apr. 4-7, 19, July 11-13. Small storage reservoir above power plant, capacity, about 30 acre-feet. Gage-height record furnished by city of Loveland.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	43	32	25	11	12	13	25	142	750	447	218	95
2.....	41	33	20	15	8.6	16	18	146	822	421	208	88
3.....	40	32	20	16	9.8	17	25	152	750	463	227	81
4.....	41	29	16	13	7.4	17	24	174	740	623	223	78
5.....	40	25	19	16	4.2	14	24	188	838	495	198	74
6.....	35	36	13	15	3.0	16	22	208	806	499	186	68
7.....	36	28		16	2.8	16	22	180	838	533	180	67
8.....	32	18		14	2.4	16	22	170	665	475	180	68
9.....	34	25	11	15	2.6	16	16	150	660	443	176	93
10.....	41	32		16	3.0	16	16	166	650	410	168	130
11.....	38	17		14	3.4	18	16	202	888	430	166	158
12.....	39	12		13	2.3	20	15	184	948	410	146	210
13.....	40	14	9	12	5.0	22	17	184	904	420	130	182
14.....	39	18		12	5.9	19	14	190	926	556	123	156
15.....	35	22		13	5.0	16	19	198	785	546	120	134
16.....	33	24		12	5.0	16	18	234	745	380	112	116
17.....	35	28		12	5.9	16	20	256	806	287	114	102
18.....	33	29	11	12	5.3	20	23	311	833	272	114	95
19.....	30	31		12	9.2	16	26	366	795	256	111	93
20.....	28	26		12	6.8	15	30	418	855	240	116	90
21.....	40	25		12	9.8	16	30	455	806	234	116	83
22.....	40	24	12	12	12	16	16	499	770	225	111	81
23.....	36	13		13	5.6	13	32	487	690	223	103	81
24.....	42	13	12	13	12	12	54	447	628	212	96	86
25.....	34	20	14	12	12	14	59	455	560	204	91	80
26.....	38	25	15	12	13	14	77	380	551	196	93	95
27.....	41	23	12	12	12	18	105	447	511	184	107	114
28.....	29	27	12	12	16	21	152	479	471	172	129	105
29.....	32	24	12	11	-----	23	162	487	483	166	129	100
30.....	36	26	12	12	-----	25	152	538	455	164	112	90
31.....	28	-----	16	9.8	-----	20	-----	646	-----	206	100	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	43	28	36.4	2,240
November.....	36	12	24.4	1,450
December.....	25	-----	12.8	787
January.....	16	9.8	13.0	799
February.....	16	2.3	7.2	400
March.....	25	12	17.0	1,050
April.....	162	14	41.7	2,480
May.....	646	142	308	18,900
June.....	948	455	731	43,500
July.....	623	164	348	21,400
August.....	227	91	142	8,730
September.....	210	67	103	6,130
The year.....	948	2.3	149	108,000

LONETREE CREEK NEAR GRANITE CANYON, WYO.

LOCATION.—Water-stage recorder in sec. 24, T. 13 N., R. 70 W., 1½ miles southwest of Granite Canyon.

DRAINAGE AREA.—23 square miles.

RECORDS AVAILABLE.—May to September 1933.

DISCHARGE.—Maximum stage during period, 4.86 feet (discharge not determined); minimum, 0.3 second-foot Sept. 2-7.

REMARKS.—Records good. Small diversion above station.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1-----	12	7.0	0.8	0.4	0.4	16-----	12	4.2	0.5	0.4	1.8
2-----	12	6.5	.7	.5	.5	17-----	12	3.4	.5	.4	1.5
3-----	16	6.3	.6	.4	.3	18-----	12	2.9	.5	.4	1.4
4-----	16	6.0	.6	.3	.3	19-----	12	2.4	.4	.4	1.2
5-----	14	5.5	.6	.3	.3	20-----	12	2.4	.4	.4	1.2
6-----	12	5.5	.5	.3	.3	21-----	12	2.0	.4	.4	.9
7-----	10	6.0	.6	.3	.3	22-----	12	1.8	.4	.4	.9
8-----	11	5.5	.6	.3	6.0	23-----	16	1.6	.4	.4	.8
9-----	8.9	5.0	.5	.3	23	24-----	16	1.6	.4	.4	.6
10-----	11	4.2	.6	.3	9.1	25-----	12	1.5	.4	.4	.6
11-----	14	3.9	.5	.3	5.2	26-----	9.9	1.4	.4	.4	2.0
12-----	12	4.2	.5	.4	4.7	27-----	9.1	1.0	.4	.4	1.8
13-----	12	4.4	.5	.4	3.4	28-----	8.3	1.0	.3	.4	1.2
14-----	15	5.0	.5	.4	3.1	29-----	8.1	.9	.3	.4	.6
15-----	15	5.5	.5	.4	2.6	30-----	7.8	.9	.4	.4	.6
						31-----	7.6	-----	.4	.4	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May-----	16	7.6	11.9	732
June-----	7	.9	3.65	217
July-----	.8	.3	.49	30
August-----	.5	.3	.38	23
September-----	23	.3	2.55	152
The period-----				1,150

MIDDLE FORK OF CROW CREEK NEAR HECLA, WYO.

LOCATION.—Water-stage recorder in sec. 20, T. 14 N., R. 70 W., a quarter of a mile above backwater from Crystal Lake Reservoir and 4 miles northwest of Hecla.

DRAINAGE AREA.—23 square miles.

RECORDS AVAILABLE.—May to September 1933. Comparable record—April to July 1902, April to November 1903, at a site $1\frac{1}{4}$ miles downstream.

DISCHARGE.—Maximum stage during period, 4.90 feet Sept. 8 (discharge not determined); minimum, 0.1 second-foot Sept. 3 (gage height, 0.03 foot).

REMARKS.—Records excellent. No diversions or regulation.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		19	2.0	1.0	0.3	16	22	8.5	1.8	0.2	0.6
2		17	2.0	1.7	.2	17	23	7.7	1.5	.2	.4
3		16	1.5	1.8	.2	18	25	6.9	1.2	.2	.4
4		15	1.4	2.0	.2	19	25	6.7	1.0	.3	.4
5		13	1.5	1.0	.2	20	24	6.3	.7	.4	.4
6		12	1.5	.9	.2	21	24	5.3	.6	.4	.4
7		13	1.7	.7	.2	22	24	4.9	.4	.3	.6
8		12	1.8	.7	15	23	35	5.3	.4	.2	.6
9		10	2.4	.4	6.7	24	41	5.1	.6	.2	.9
10		9.8	2.0	.3	3.1	25	33	4.5	.4	.2	.7
11		9.0	1.4	.3	2.0	26	28	4.1	.3	.2	1.2
12		9.4	1.0	.3	1.5	27	26	3.3	.3	.6	1.7
13	18	9.8	.7	.3	1.4	28	25	3.0	.3	1.0	1.4
14	21	9.2	1.2	.3	1.2	29	23	2.8	.3	.9	1.0
15	23	8.1	1.7	.2	.9	30	22	2.6	.4	.4	.7
						31	20		1.0	.3	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 13-31	41	18	25.4	957
June	19	2.6	8.64	514
July	2.4	.3	1.13	69
August	2.0	.2	.58	36
September	15	.2	1.49	89
The period				1,660

SOUTH FORK OF CROW CREEK NEAR HECLA, WYO.

LOCATION.—Water-stage recorder in sec. 2, T. 13 N., R. 70 W., just above back-water from South Crow Creek Reservoir, 2.8 miles southwest of Hecla.

DRAINAGE AREA.—16 square miles.

RECORDS AVAILABLE.—May to September 1933.

DISCHARGE.—Maximum during period, 26 second-feet Sept. 8 (gage height, 2.59 feet); no flow July 22 to Sept. 5.

REMARKS.—Records good. Discharge interpolated July 1, 3-9, 11-16, 18-23. No diversions or regulation.

Discharge, in second-feet, 1933

Day	May	June	July	Sept.	Day	May	June	July	Sept.
1.....		3.8	0.2	0	16.....	7.6	1.5	0.2	0.3
2.....		3.6	.2	0	17.....	7.4	1.6	.2	.2
3.....		3.3	.2	0	18.....	7.2	1.4	.2	.1
4.....		3.2	.2	0	19.....	7.1	1.0	.1	.1
5.....		2.8	.2	0	20.....	6.6	1.0	.1	.1
6.....	7.6	2.6	.2	.1	21.....	6.4	.7	.1	.1
7.....	6.6	3.0	.2	.1	22.....	6.2	.7	0	.1
8.....	6.5	2.4	.2	.1	23.....	8.4	.5	0	.1
9.....	5.8	2.0	.2	9.8	24.....	8.6	.5	0	.1
10.....	6.4	2.0	.2	3.2	25.....	6.6	.6	0	.1
11.....	8.0	1.9	.2	1.3	26.....	5.3	.5	0	.3
12.....	6.9	2.2	.1	1.1	27.....	5.2	.4	0	.3
13.....	7.2	2.4	.1	.6	28.....	4.8	.3	0	.3
14.....	8.0	2.2	.2	.4	29.....	4.6	.2	0	.2
15.....	7.6	2.1	.2	.3	30.....	4.4	.2	0	.2
					31.....	4.3		0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 6-31.....	8.6	4.3	6.59	340
June.....	3.8	.2	1.69	101
July.....	.2	0	.12	7
September.....	9.8	0	.65	39
The period.....				487

NOTE.—No flow during August.

NORTH FORK OF CROW CREEK NEAR HECLA, WYO.

LOCATION.—Water-stage recorder in sec. 35, T. 15 N., R. 70 W., 800 feet above backwater from North Crow Creek, Diversion Reservoir, 5½ miles northwest of Hecla.

DRAINAGE AREA.—27 square miles.

RECORDS AVAILABLE.—May to September 1933.

DISCHARGE.—Maximum stage during period, 8.65 feet Sept. 8 (discharge not determined); minimum, 0.7 second-foot July 12-14.

REMARKS.—Records fair. Flow partly regulated by North Crow Creek Reservoir.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1-----		1.7	1.0	4.5	4.5	16-----	5.0	2.3	0.9	4.0	1.8
2-----		1.6	1.1	16	4.2	17-----	4.4	2.1	2.4	4.0	1.5
3-----		1.8	1.2	25	4.4	18-----	4.1	1.5	9.4	4.1	1.6
4-----		2.0	1.2	10	5.8	19-----	4.1	1.6	10	4.1	1.4
5-----		2.1	1.1	6.6	6.6	20-----	3.5	1.5	11	5.6	1.4
6-----		2.2	1.2	5.6	8.9	21-----	3.3	1.3	11	14	1.2
7-----		2.3	1.4	5.1	11	22-----	3.7	1.4	11	14	1.2
8-----		2.2	1.3	4.8	44	23-----	4.7	1.4	7.7	6.1	1.3
9-----		2.2	1.2	4.4	25	24-----	3.4	1.4	5.4	5.4	1.9
10-----		2.2	.9	4.2	6.0	25-----	3.4	1.3	4.1	7.1	1.8
11-----		2.2	.9	4.1	3.0	26-----	3.1	1.2	4.0	7.5	2.2
12-----		2.1	.8	3.8	2.2	27-----	2.7	1.2	3.8	9.9	2.1
13-----		2.0	.8	3.8	2.1	28-----	2.7	1.2	4.0	10	2.0
14-----		2.0	.8	4.0	1.8	29-----	2.7	1.2	4.4	10	1.9
15-----		2.0	1.0	3.8	1.8	30-----	2.6	1.0	4.7	6.1	1.7
						31-----	2.0	-----	4.8	4.8	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 16-31-----	5	2	3.46	110
June-----	2.3	1	1.74	104
July-----	11	.8	3.69	227
August-----	25	3.8	7.17	441
September-----	44	1.2	5.21	310
The period-----				1,190

LODGEPOLE CREEK NEAR FEDERAL, WYO.

LOCATION.—Water-stage recorder in sec. 34, T. 16 N., R. 70 W., 7 miles north-east of Federal.

DRAINAGE AREA.—25 square miles.

RECORDS AVAILABLE.—May to September 1933.

DISCHARGE.—Maximum during period, 21 second-feet May 24 (gage height, 1.30 feet); minimum, 0.1 second-foot Aug. 16 (gage height, 0.16 foot).

REMARKS.—Records good. Discharge estimated May 22 to June 7. Small diversions above station.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1.....		12	1.6	0.6	0.3	16.....		6.5	1.5	0.2	0.4
2.....		11	1.5	.6	.2	17.....		5.8	1.2	.2	.4
3.....		11	1.6	.9	.2	18.....		4.5	1.2	.2	.3
4.....		10	1.8	.9	.2	19.....		4.5	1.2	.4	.3
5.....		10	1.7	.6	.2	20.....		5.2	.8	.5	.2
6.....		9.0	1.6	.4	.2	21.....		4.3	.6	.4	.2
7.....		9.0	2.1	.4	.2	22.....	° 13	3.9	.6	.3	.4
8.....		9.0	2.5	.4	.4	23.....	16	4.1	.7	.2	.4
9.....		7.6	1.7	.4	.7	24.....	° 21	3.8	.7	.2	.2
10.....		6.5	1.3	.3	.9	25.....	17	3.6	.5	.2	.3
11.....		6.1	1.2	.3	.6	26.....	15	3.9	.4	.4	.5
12.....		5.6	.9	.2	.8	27.....	14	2.9	.4	1.0	.8
13.....		5.4	.8	.2	.8	28.....	13	2.4	.4	1.2	.7
14.....		5.0	.9	.2	.6	29.....	12	2.2	.4	1.0	.6
15.....		5.6	1.8	.2	.5	30.....	12	2.0	.4	.6	.5
						31.....	12		.4		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 22-31.....	21	12	14.5	288
June.....	12	2	6.08	362
July.....	2.5	.4	1.11	68
August.....	1.2	.2	.45	28
September.....	.9	.2	.43	26
The period.....				772

° Result of discharge measurement.

LODGEPOLE CREEK AT BUSHNELL, NEBR.

LOCATION.—Staff gage in sec. 33, T. 15 N., R. 57 W., 1½ miles east of Bushnell.
DRAINAGE AREA.—1,090 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, about 620 second-feet Aug. 27 (gage height, 6.8 feet); minimum, 4 second-feet Mar. 9 (gage height, 0.22 foot).

1931-33: Maximum, that of Aug. 27, 1933; minimum, that of Mar. 9, 1933.

REMARKS.—Records fair except those for Dec. 15 to Feb. 25, which were estimated on basis of two discharge measurements and temperature records, and that estimated Aug. 27. Small diversions upstream.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	15	13	25	17	19	14	12	8	8	24	
2	12	15	13		16	18	15	11	8	17	21	
3	12	15	13		18	17	15	11	9	12	18	
4	12	15	11		18	17	19	11	9	12	17	
5	13	15	12		18	13	19	11	9	53	24	
6	13	17	12	20	16	15	18	11	9	17	23	
7	13	16	9	18	10	17	18	9	9	15	20	
8	13	15	10	16	6	17	20	9	9	14	18	
9	14	16	11	14	4	17	18	9	9	14	18	
10	14	15	11	12	8	16	19	9	8	13	20	
11	13	14	13	12	30	14	24	9	8	13	19	
12	14	13	12		35	16	25	9	8	12	18	
13	13	14	12		35	15	24	9	8	12	18	
14	13	14	12		33	15	22	9	8	12	18	
15	13	12	12		26	16	21	9	8	11	17	
16	14	13	12	26	16	23	9	8	10	17		
17	14	13	12	16	24	15	20	9	8	11	17	
18	14	14			23	15	19	9	8	12	17	
19	14	12			23	14	17	9	8	12	17	
20	14	12			26	20	18	9	8	13	17	
21	14	13			22	35	15	9	8	13	17	
22	14	13	15	20	22	37	14	9	8	13	17	
23	14	12			20	31	23	9	8	13	16	
24	14	11			21	27	22	9	8	12	16	
25	14	13			22	25	20	9	8	13	17	
26	15	12			14	21	23	18	9	8	17	19
27	15	12	20	17	16	20	21	16	9	460	20	
28	15	14			17	20	18	17	9	8	95	18
29	14	13			20	16	16	9	8	63	18	
30	15	13			20	14	15	8	8	46	17	
31	15				19		12		8	26		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15	12	13.6	836
November	17	11	13.7	815
December		9	13.9	855
January			27.0	1,660
February			17.6	978
March	35	4	20.6	1,270
April	37	13	19.0	1,130
May	25	12	18.6	1,140
June	12	8	9.4	559
July	9	8	8.2	504
August	460	8	34.3	2,110
September	24	16	18.4	1,090
The year	460	4	17.9	12,900

* Result of discharge measurement.

SOUTH FORK OF LODGEPOLE CREEK NEAR FEDERAL, WYO.

LOCATION.—Water-stage recorder in sec. 15, T. 15 N., R. 70 W., 6 miles northeast of Federal.

DRAINAGE AREA.—16 square miles.

RECORDS AVAILABLE.—May to September 1933.

DISCHARGE.—Maximum stage during period, 4.95 feet Sept. 8 (discharge not determined); minimum, 0.3 second-foot Aug. 15 (gage height, 0.47 foot).

REMARKS.—Records good. Small diversions above station.

Discharge, in second-feet, 1933

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		8.1	1.8	0.9	0.6	16		3.8	1.5	0.4	1.0
2		7.7	1.7	1.4	.5	17		3.6	1.4	.5	.9
3		7.2	1.6	2.1	.4	18		3.2	1.3	.6	.9
4		6.8	1.5	1.5	.4	19		3.2	1.2	.6	.9
5		6.1	1.6	1.0	.4	20		3.1	1.0	.9	.8
6		5.9	1.4	.9	.5	21		3.0	1.0	.7	.8
7		5.9	1.4	.9	.4	22		2.8	1.0	.6	.8
8		5.2	1.8	.9	12	23		2.7	1.1	.6	.7
9		4.7	1.7	.6	2.0	24	11	2.7	1.0	.6	.6
10		4.6	1.5	.6	1.3	25	11	2.6	.9	.6	.7
11		4.2	1.3	.6	1.2	26	11	2.7	.6	1.0	1.4
12		4.1	1.1	.6	1.1	27	10	2.5	.5	1.4	1.4
13		4.0	1.0	.4	1.2	28	9.6	2.2	.5	1.4	1.0
14		3.6	1.1	.5	1.1	29	9.0	2.0	.6	1.3	.9
15		3.4	1.8	.4	1.0	30	8.6	1.9	.6	1.0	.8
						31	8.3		.7	.7	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 24-31	11	8.3	9.81	156
June	8.1	1.9	4.12	245
July	1.8	.5	1.20	74
August	2.1	.4	.85	52
September	12	.4	1.26	75
The period				602

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.

LOCATION.—Chain gage in sec. 10, T. 14 N., R. 10 W., at St. Paul. Zero of gage is 1,778.4 feet above mean sea level.

DRAINAGE AREA.—7,320 square miles.

RECORDS AVAILABLE.—May 1895 to October 1897; April to October 1899; April to November 1903; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 4,830 second-feet July 15 (gage height, 2.52 feet); minimum, not determined, probably occurred during winter.

1895-97, 1899, 1903, 1928-33: Maximum, 18,000 second-feet Mar. 17, 1932 (gage height, 5.19 feet); minimum, 230 second-feet Nov. 23, 1929 (gage height, 0.30 foot).

REMARKS.—Records fair. Discharge estimated Oct. 2-4, 14-19, Nov. 6 to Dec. 2, Dec. 4 to Feb. 28, Mar. 16-20, 28-29, Apr. 5-17, May 10, 14-21, June 1, 16-20, July 20-23, 27-31, Aug. 6, 19, 28, Sept. 7-8. No diversions or regulation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,100	1,080	980			2,740	1,250	1,650	840	825	825	998
2.....	1,150	947	1,110			2,470	1,150	1,590	780	689	3,990	998
3.....	1,100	930	1,180			2,000	1,320	1,380	780	754	4,430	998
4.....	1,120	1,030	1,140			1,630	1,240	1,500	728	715	1,710	1,030
5.....	1,180	998	1,140			1,740	1,200	1,580	825	683	1,180	964
6.....	1,200	960		1,100	625	1,800	1,140	1,560	702	633	1,150	870
7.....	1,170	940				1,470	1,090	3,230	825	715	1,130	840
8.....	1,290	880				1,380	1,030	2,300	947	795	1,490	815
9.....	1,500	800				1,270	1,000	1,710	930	1,690	1,840	795
10.....	1,220	740				1,450	1,060	1,770	840	1,290	1,560	780
11.....	1,180	740	550			1,560	1,040	1,800	840	997	915	780
12.....	1,150	860		1,410		1,580	1,030	1,590	998	1,050	795	1,450
13.....	1,100	870				1,590	1,020	1,590	885	1,360	754	1,610
14.....	1,180	850				1,690	1,010	1,560	900	3,540	930	1,670
15.....	1,170	830			700	1,590	997	1,500	840	4,530	885	1,430
16.....	1,010	663		1,250		1,710	920	1,400	780	1,760	885	1,200
17.....	960	620				1,720	950	1,220	750	1,130	810	1,710
18.....	950	580				1,740	998	1,200	710	947	795	1,200
19.....	1,030	710				1,760	1,020	1,180	680	885	800	1,030
20.....	1,050	740			972	1,780	1,200	1,170	640	883	930	947
21.....	1,030	870				1,800	2,190	1,150	754	850	900	855
22.....	1,120	840				1,760	2,060	1,050	754	840	1,030	964
23.....	1,080	760	740			1,580	1,820	998	795	855	1,180	947
24.....	1,180	850			1,500	1,410	1,270	1,220	795	870	1,070	998
25.....	1,130	850				1,520	1,290	1,290	728	870	1,250	947
26.....	1,180	980		1,000		1,310	1,490	1,170	885	840	1,270	998
27.....	1,000	860				1,290	1,410	1,340	885	825	998	1,170
28.....	1,100	860				1,280	1,400	1,250	795	810	980	947
29.....	915	920				1,260	1,500	1,240	754	800	964	825
30.....	1,080	920				1,250	1,740	900	825	790	1,130	885
31.....	981					1,320		964		780	1,070	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,500	915	1,120	68,900
November.....	1,080	580	849	50,600
December.....	1,180		738	45,400
January.....			1,110	68,200
February.....			612	50,600
March.....	2,740	1,250	1,630	100,000
April.....	2,190	920	1,260	75,000
May.....	3,230	900	1,450	89,200
June.....	998	640	806	48,000
July.....	4,530	638	1,130	69,500
August.....	4,430	754	1,280	78,700
September.....	1,670	780	1,060	63,100
The year.....	4,530		1,110	807,000

• Result of discharge measurement.

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.

LOCATION.—Chain gage in sec. 22, T. 15 N., R. 10 W., 3 miles north of St. Paul.

DRAINAGE AREA.—4,040 square miles.

RECORDS AVAILABLE.—May 1895 to October 1897; April to October 1899; April to December 1903; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,060 second-feet July 8 (gage height, 4.40 feet); minimum, not determined, probably occurred during winter.

1895-97, 1899, 1903, 1928-33: Maximum discharge (estimated), 90,000 second-feet June 6, 1896; minimum, 126 second-feet Jan. 15, 1931.

REMARKS.—Records fair. Discharge estimated Dec. 6 to Feb. 28 on basis of two discharge measurements and temperature records. No diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	760	891	879			1,300	1,210	1,530	742	1,160	666	792
2	760	903	1,030			1,000	1,120	1,440	700	605	691	771
3	824	891	1,060			1,150	1,060	1,150	674	590	975	750
4	824	903	1,030			1,160	1,030	1,340	658	552	1,240	725
5	813	903	1,030			1,120	1,060	1,440	620	540	1,000	716
6	855	903		875	450	975	891	1,440	598	540	903	666
7	903	939				915	879	2,040	598	651	855	658
8	927	989				975	879	1,480	725	3,870	1,530	636
9	1,020	927				1,060	855	1,360	792	1,320	1,210	613
10	1,030	750				963	927	1,510	708	891	750	605
11	989	643	450			1,030	915	1,730	708	716	700	605
12	927	620				1,120	903	1,440	867	683	683	1,150
13	903	813		965		1,030	903	1,440	700	867	674	834
14	879	879				1,090	879	1,440	683	782	666	813
15	824	651			500	1,270	782	1,320	643	782	683	792
16	792	576				1,040	771	1,180	620	844	700	2,270
17	760	540		900		1,240	771	1,130	613	1,340	700	903
18	771	489				1,320	879	1,090	584	1,090	683	824
19	855	620				927	903	1,120	559	844	683	813
20	903	683				834	1,020	1,070	547	760	782	792
21	802	792				691	1,150	1,060	605	666	792	742
22	855	760				733	1,180	951	628	666	750	725
23	903	691				733	1,370	891	613	733	879	742
24	927	771	650		1,000	867	1,180	1,000	628	771	855	733
25	1,040	771		800		939	1,150	1,030	636	771	844	725
26	1,000	867			1,840	939	1,150	1,120	708	733	834	725
27	903	771			1,600	1,020	1,180	1,040	691	700	855	716
28	927	771			1,450	1,060	1,120	879	613	683	834	725
29	927	813				1,090	1,240	879	613	666	834	742
30	927	867				1,830	1,680	855	792	651	834	742
31	927					1,120		792		651	824	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,040	760	886	54,500
November	989	489	779	46,400
December	1,060		643	39,500
January			857	52,700
February	1,840		692	38,400
March	1,830	691	1,050	64,600
April	1,680	771	1,030	61,300
May	2,040	792	1,230	75,600
June	867	547	662	39,400
July	3,870	540	875	53,800
August	1,530	666	836	51,400
September	2,270	605	802	47,700
The year	3,870		864	625,000

* Result of discharge measurement.

ELKHORN RIVER AT NELIGH, NEBR.

LOCATION.—Chain gage in sec. 20, T. 25 N., R. 6 W., at Neligh. Prior to Apr. 15, 1933, staff gage 70 feet down stream with same datum but gage readings not comparable because of change in control.

DRAINAGE AREA.—1,740 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, 596 second-feet May 12 (gage height, 4.77 feet); minimum, 57 second-feet July 1, 4, 5 (gage height, 2.04 feet).

1931-33: Maximum, 670 second-feet June 11, 1932 (gage height, 3.64 feet on former gage); minimum, 12 second-feet July 2, 1932.

REMARKS.—Records good except those for Nov. 15-23, Dec. 8 to Feb. 28, which were estimated on basis of two discharge measurements and temperature records. No diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	107	150	174	-----	-----	286	310	336	160	5 ³	77	90
2.....	108	156	162	-----	-----	274	290	365	150	63	148	110
3.....	107	156	156	-----	-----	254	290	326	136	60	319	108
4.....	105	159	153	-----	-----	232	232	305	134	5 ³	259	92
5.....	105	162	145	-----	-----	246	208	302	136	5 ³	206	84
6.....	100	162	145	-----	-----	246	201	298	131	5 ³	218	86
7.....	100	165	128	• 156	-----	222	184	363	128	13 ³	200	82
8.....	100	159	-----	-----	-----	208	168	459	138	17 ³	173	81
9.....	98	140	125	-----	-----	201	194	617	134	14 ³	165	86
10.....	100	125	-----	-----	-----	174	201	542	130	116	140	80
11.....	102	135	-----	-----	-----	156	194	565	126	11 ³	128	79
12.....	102	153	-----	-----	-----	201	194	587	123	113	112	89
13.....	111	180	120	-----	-----	229	180	573	118	113	112	107
14.....	115	198	-----	-----	-----	215	180	506	113	103	107	102
15.....	116	180	-----	-----	-----	201	174	451	111	101	102	100
16.....	111	170	-----	-----	-----	204	167	386	108	98	98	108
17.....	111	160	-----	-----	-----	208	164	329	104	10 ³	99	116
18.....	113	150	-----	-----	-----	262	163	298	98	117	93	117
19.....	118	160	-----	-----	-----	201	157	259	88	111	150	110
20.....	125	160	-----	-----	-----	140	167	240	74	10 ⁴	148	104
21.....	123	160	-----	-----	• 150	156	191	222	63	95	146	94
22.....	142	160	-----	-----	-----	204	191	214	62	100	138	86
23.....	194	160	140	-----	-----	246	184	202	71	10 ³	134	82
24.....	184	168	-----	-----	-----	294	184	193	81	110	128	75
25.....	177	156	-----	-----	-----	310	184	181	78	99	120	72
26.....	174	156	-----	-----	-----	322	175	175	76	88	117	99
27.....	153	156	-----	-----	-----	338	169	167	73	80	112	107
28.....	142	171	-----	-----	-----	342	166	183	70	69	107	108
29.....	145	187	-----	-----	-----	370	186	200	66	67	102	100
30.....	138	180	-----	-----	-----	410	326	175	61	60	100	107
31.....	145	-----	-----	-----	-----	370	-----	166	-----	60	95	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	194	98	125	7,690
November.....	198	125	161	9,580
December.....	174	-----	138	8,480
January.....	-----	-----	^b 165	10,100
February.....	-----	-----	^b 145	8,050
March.....	410	140	249	15,300
April.....	326	157	199	11,800
May.....	587	166	325	20,000
June.....	160	61	105	6,250
July.....	178	58	95 1	5,850
August.....	319	77	140	8,610
September.....	117	72	95 4	5,680
The year.....	587	58	162	117,000

• Result of discharge measurement.

^b Estimated.

ELKHORN RIVER AT WATERLOO, NEBR.

LOCATION.—Chain gage in sec. 10, T. 15 N., R. 10 E., at Waterloo. Zero of gage is 1,110.1 feet above mean sea level.

DRAINAGE AREA.—6,390 square miles.

RECORDS AVAILABLE.—May 1911 to July 1913; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,020 second-feet July 13 (gage-height, 6.04 feet); minimum, not determined, probably occurred during winter.

1911-13, 1928-33: Highest flood occurred in April 1912 (gage height and discharge not determined); minimum, 118 second-feet Sept. 12, 1931 (gage height, 0.78 foot).

REMARKS.—Records good except those for Nov. 17 to Feb. 28 which were estimated on basis of three discharge measurements and temperature records. No diversions.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	526	500	550	400	848	1,130	2,700	1,780	588	292	353	350
2.....	532	500				1,100	1,790	1,810	554	292	412	354
3.....	526	500				947	1,400	1,580	542	289	542	369
4.....	515	505				848	1,300	1,300	510	286	434	388
5.....	515	526				862	1,270	1,150	483	282	606	396
6.....	500	520	300	475	250	848	1,150	1,060	490	253	548	438
7.....	500	532				825	1,060	963	465	317	520	420
8.....	500	520				832	1,020	1,190	452	388	542	365
9.....	510	526				818	1,010	1,470	465	495	447	317
10.....	495	495				751	963	1,820	542	1,330	424	296
11.....	465	447	300	300	676	1,010	1,270	561	1,430	420	282	
12.....	470	447				716	971	1,280	470	1,390	429	331
13.....	470	452				795	923	1,460	416	6,600	376	526
14.....	452	495				931	862	1,460	402	2,610	361	404
15.....	460	456				1,120	840	1,370	392	2,250	338	376
16.....	442	350	375	475	375	1,050	825	1,290	369	1,210	328	424
17.....	438	330				908	802	1,190	372	1,090	310	400
18.....	424	300				840	810	1,090	353	947	306	878
19.....	424	400				1,170	788	987	331	772	357	765
20.....	416	450				1,100	765	915	320	810	372	588
21.....	404	520	375	500	575	1,050	848	802	417	676	554	630
22.....	442	500				963	818	758	303	656	460	442
23.....	537	480				963	810	723	310	643	438	380
24.....	526	520				1,060	758	682	313	542	438	350
25.....	542	520				987	765	669	303	537	424	324
26.....	559	550	375	500	575	750	1,010	758	636	292	532	490
27.....	542	530				800	1,190	709	618	303	505	480
28.....	564	530				991	1,640	676	612	302	438	313
29.....	542	540				2,280	669	606	302	396	408	303
30.....	520	560				2,600	709	600	302	376	384	303
31.....	495					3,000		606		358	365	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	564	404	492	30,300
November.....	560	300	483	28,700
December.....			379	23,300
January.....			485	29,800
February.....	991		427	23,700
March.....	3,000	676	1,130	69,500
April.....	2,700	669	993	59,100
May.....	1,820	600	1,090	67,000
June.....	588	299	405	24,100
July.....	6,600	253	935	57,500
August.....	606	306	429	26,400
September.....	878	282	415	24,700
The year.....	6,600		641	464,000

* Result of discharge measurement.

NISHNABOTNA RIVER BASIN

NISHNABOTNA RIVER ABOVE HAMBURG, IOWA

LOCATION.—Chain gage in S½ sec. 11, T. 67 N., R. 42 W., 1 mile below junction of East and West Forks and 3 miles northeast of Hamburg.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933. March 1922 to September 1923 at site 6 miles downstream.

DISCHARGE.—Maximum during year, 7,540 second-feet Jan. 22 (gage height, 17.10 feet); minimum, 63 second-feet Sept. 11 (gage height, 2.20 feet).

1922-23, 1928-33: Maximum, 12,000 second-feet Mar. 13, 1923 (gage height, 22.10 feet); minimum, 20 second-feet Mar. 6, 1931 (gage height, 1.32 feet).

REMARKS.—Records good except those for periods of ice effect, Nov. 17-22, Dec. 8-25, 27-31, Jan. 1-16, 18-20, 28-30, Feb. 4-20, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	466	376	443	848	540	346	1,350	565	235	323	95	85
2.....	466	398	466	820	665	323	1,120	466	235	224	184	102
3.....	466	376	466	820	442	323	1,010	418	214	174	136	102
4.....	443	398	443	820	370	300	888	394	204	155	102	95
5.....	466	398	420	878	323	346	800	418	194	136	88	102
6.....	443	420	420	878	278	370	772	394	174	127	78	102
7.....	443	420	376	942	235	418	744	394	164	164	83	83
8.....	420	443	355	974	214	442	691	418	155	418	88	75
9.....	420	420	295	974	194	466	665	394	136	665	300	70
10.....	420	420	225	663	194	323	640	370	136	235	2,570	65
11.....	420	398	193	587	194	278	615	370	136	194	1,660	63
12.....	420	376	193	587	194	323	540	717	136	323	772	64
13.....	420	466	193	663	194	394	540	466	118	982	346	919
14.....	398	489	193	715	194	370	540	442	127	490	256	2,370
15.....	466	443	193	689	214	370	515	394	118	323	278	1,010
16.....	466	741	193	715	235	323	490	346	118	214	235	1,750
17.....	420	820	193	537	278	300	490	323	110	174	164	1,150
18.....	398	820	193	612	346	323	490	300	102	214	174	418
19.....	376	689	193	637	442	370	466	300	95	174	155	278
20.....	376	612	193	637	565	370	466	278	88	146	214	246
21.....	355	663	209	767	590	256	466	418	85	127	346	194
22.....	398	715	242	5,480	717	370	442	300	95	110	691	164
23.....	587	537	314	5,130	665	394	418	640	88	300	615	146
24.....	663	443	420	1,660	515	515	418	323	95	394	418	118
25.....	562	466	663	888	490	640	418	300	102	246	256	102
26.....	489	420	2,080	717	418	691	394	278	102	174	174	466
27.....	443	398	1,460	515	394	829	370	256	102	174	146	1,530
28.....	420	398	1,200	640	370	950	370	246	2,080	118	127	744
29.....	398	443	1,040	800	-----	919	370	300	278	102	110	323
30.....	398	443	942	800	-----	2,130	466	246	1,270	88	102	235
31.....	398	-----	910	615	-----	1,890	-----	246	-----	85	88	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Irches	Acre-feet
October.....	663	355	443	0.158	0.18	27,200
November.....	820	376	495	.177	.20	29,500
December.....	2,080	193	494	.176	.20	30,400
January.....	5,480	515	1,060	.379	.44	65,200
February.....	717	194	374	.134	.14	20,800
March.....	2,130	256	537	.192	.22	33,000
April.....	1,350	370	599	.214	.24	35,600
May.....	717	246	378	.135	.16	23,200
June.....	2,080	85	243	.087	.10	14,500
July.....	982	85	251	.090	.10	15,400
August.....	2,570	78	356	.127	.15	21,900
September.....	2,370	63	439	.157	.18	26,100
The year.....	5,480	63	474	.169	2.31	343,000

TARKIO RIVER BASIN

TARKIO RIVER AT FAIRFAX, MO.

LOCATION.—Chain gage on line between secs. 22 and 27, T. 64 N., R. 40 W., at highway bridge half a mile west of Fairfax.

DRAINAGE AREA.—508 square miles.

RECORDS AVAILABLE.—March 1922 to September 1933.

DISCHARGE.—Maximum during year, 3,570 second-feet Aug. 21 (gage height, 11.80 feet); minimum, 7 second-feet Feb. 12-14; minimum gage height, 2.18 feet Sept. 11, 12.

1922-33: Maximum, about 15,000 second-feet July 7, 1927 (gage height, 22.33 feet, present datum); minimum, 1 second-foot Dec. 21, 1924, to Jan. 4, 1925. Average, 11 years (1922-33), 163 second-feet.

REMARKS.—Records fair except those estimated for Jan. 13, July 2-5, and those for periods of ice effect, Nov. 15-27, Dec. 8-22, 31, Jan. 1, 2, Feb. 4-20, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	28	52	91	44	35	262	49	26	351	14	27
2	44	37	47	91	32	33	162	44	24	200	39	18
3	39	33	43	88	22	29	126	42	25	100	126	17
4	41	35	44	70	21	31	108	37	23	50	42	16
5	39	32	35	62	16	47	98	62	22	25	32	14
6	44	36	39	48	11	85	88	62	20	16	18	14
7	39	37	24	37	11	88	85	47	18	15	16	11
8	36	171	21	35	11	68	73	37	14	351	19	11
9	35	73	16	28	11	44	68	33	14	93	20	9
10	42	62	16	52	11	35	65	36	14	52	85	9
11	44	47	16	28	11	28	62	35	13	27	37	9
12	42	34	11	52	7	44	54	374	18	26	22	9
13	37	62	11	52	7	47	54	122	16	135	16	306
14	35	76	11	53	7	42	52	69	13	36	14	126
15	35	91	11	49	11	32	49	52	12	25	15	49
16	37	76	11	49	16	27	49	42	12	20	14	284
17	37	62	11	21	21	35	47	37	11	18	14	80
18	39	49	11	73	37	33	47	31	9	33	37	42
19	33	37	11	35	91	35	49	31	9	26	35	30
20	33	37	16	20	126	37	85	27	8	21	37	52
21	32	28	21	49	135	57	57	374	9	19	2,170	37
22	32	28	49	65	108	39	52	69	9	16	662	24
23	101	21	284	52	57	59	45	126	9	16	113	20
24	70	21	1,500	42	73	126	44	68	11	15	397	421
25	49	28	374	38	54	135	42	53	10	15	69	19
26	47	28	96	42	44	126	42	39	11	15	30	732
27	42	37	66	22	37	126	39	36	11	14	88	126
28	39	59	53	47	37	91	33	41	1,240	14	29	53
29	35	49	52	101	-----	76	35	35	73	13	23	44
30	35	47	57	306	-----	200	57	32	924	13	20	30
31	35	-----	76	44	-----	162	-----	28	-----	14	18	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	101	32	41.6	0.082	0.09	2,560
November	171	21	48.7	.096	.11	2,900
December	1,500	11	99.5	.196	.23	6,120
January	306	20	59.4	.117	.13	3,650
February	135	7	38.2	.075	.08	2,120
March	200	27	66.2	.130	.15	4,070
April	262	33	71.0	.140	.16	4,220
May	374	27	70.0	.138	.16	4,300
June	1,240	8	87.6	.172	.19	5,210
July	351	13	57.5	.113	.13	3,540
August	2,170	14	138	.272	.31	8,480
September	732	9	88.0	.173	.19	5,240
The year	2,170	7	72.4	.143	1.93	52,400

NODAWAY RIVER BASIN

NODAWAY RIVER NEAR BURLINGTON JUNCTION, MO.

LOCATION.—Chain gage in sec. 17, T. 65 N., R. 37 W., at bridge on State highway 18, 1½ miles west of Burlington Junction.

DRAINAGE AREA.—1,240 square miles.

RECORDS AVAILABLE.—March 1922 to September 1933.

DISCHARGE.—Maximum during year, 1,750 second-feet Apr. 1 (gage height, 6.55 feet); minimum, 21 second-feet July 29, 30; minimum gage height, 2.04 feet July 30.

1922-33: Maximum, 21,000 second-feet July 6, 1929; maximum gage height, 19.5 feet Sept. 3, 1926; minimum, 6 second-feet June 1, July 26, 1925; minimum gage height, 1.80 feet July 26, 1923. Average, 11 years (1922-33), 428 second-feet.

REMARKS.—Records good except those estimated during periods of ice effect, Nov. 14-19, Dec. 9-23, Feb. 5-18, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	132	109	198	231	179	146	1,750	179	• 70	38	22	41
2.....	132	105	286	231	179	127	1,160	192	64	35	34	40
3.....	132	102	269	1,160	156	127	737	• 180	60	23	218	43
4.....	123	99	238	1,100	34	118	516	168	56	• 22	98	41
5.....	123	105	254	1,050	28	118	• 470	168	52	22	48	34
6.....	123	105	238	645	28	168	435	192	48	22	35	28
7.....	132	142	269	192	• 28	179	340	179	45	289	26	27
8.....	123	320	254	218	28	192	358	204	37	156	27	27
9.....	105	432	• 185	192	28	• 160	340	• 180	35	274	737	28
10.....	119	393	142	179	28	136	289	• 168	38	64	645	23
11.....	119	254	105	179	28	98	231	146	37	48	• 591	• 30
12.....	119	210	90	179	35	127	204	289	38	179	537	37
13.....	116	269	77	127	35	146	218	645	31	43	94	1,050
14.....	119	269	77	1,160	35	136	204	601	• 30	• 42	83	737
15.....	116	210	77	179	35	136	192	289	27	40	62	118
16.....	102	142	77	204	35	127	204	245	27	179	54	156
17.....	116	142	77	156	73	127	192	168	23	• 100	416	455
18.....	119	142	77	• 300	136	• 130	204	156	26	43	156	168
19.....	112	163	77	231	218	475	192	136	25	39	56	95
20.....	102	163	77	192	245	179	• 192	118	• 24	27	101	83
21.....	99	224	90	204	• 250	136	192	340	23	26	179	86
22.....	102	210	• 90	204	274	179	168	168	23	25	645	54
23.....	152	210	105	245	289	179	168	136	23	24	558	60
24.....	174	210	374	259	231	156	156	156	22	28	601	836
25.....	185	210	1,560	259	192	396	156	127	22	26	836	71
26.....	163	224	1,270	204	179	455	146	98	23	24	156	836
27.....	142	224	475	168	156	516	146	101	23	23	• 120	322
28.....	132	210	358	136	146	496	136	108	60	23	81	179
29.....	119	238	289	81	-----	455	136	83	111	21	54	118
30.....	109	210	179	156	-----	• 1,000	156	78	98	21	50	98
31.....	112	-----	115	192	-----	1,160	-----	76	-----	22	47	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	185	99	125	0.101	0.12	7,690
November.....	432	99	202	.163	.18	12,000
December.....	1,560	77	260	.210	.24	16,000
January.....	1,160	81	329	.265	.31	20,200
February.....	289	28	118	.095	.10	6,550
March.....	1,160	98	267	.215	.25	16,400
April.....	1,750	136	333	.269	.30	19,800
May.....	645	76	196	.158	.18	12,100
June.....	111	22	40.7	.033	.04	2,420
July.....	289	21	62.8	.051	.06	3,860
August.....	836	22	238	.192	.22	14,500
September.....	1,050	23	197	.159	.18	11,700
The year.....	1,750	21	198	.160	2.18	143,000

• Estimated.

KANSAS RIVER BASIN

ARIKAREE RIVER AT HAIGLER, NEBR.

LOCATION.—Staff gage in sec. 28, T. 1 N., R. 41 W., half a mile northwest of Haigler.

DRAINAGE AREA.—2,210 square miles.

RECORDS AVAILABLE.—March 1932 to September 1933.

DISCHARGE.—Maximum stage during year, 11.0 feet July 9 (discharge not determined because of backwater); minimum, 0.2 second-foot July 3 (gage height, 1.15 feet).

1932-33: Maximum and minimum, those of 1933.

REMARKS.—Records fair. Discharge estimated Dec. 11 to Feb. 25, Mar. 4-12, on the basis of two discharge measurements and temperature records. Small diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5	19	10	14	20	34	16	56	14	0.5	2	29
2	8	19	10			34	15	40	14	.3	313	58
3	8	18	10			34	15	38	14	.2	40	24
4	9	18	10			34	14	92	12	.6	18	53
5	12	18	10			30	14	106	10	.8	13	18
6	13	19	12	16	10	71	14	7	8	.4	10	16
7	12	16	12			14	14	56	6	.5	7	14
8	11	14	12			25	14	48	12	.5	56	11
9	13	14	12			14	14	46	11	3,300	38	8
10	17	15	12			14	14	53	10	90	17	8
11	18	15	12	17	40	26	14	47	10	41	10	12
12	14	18				28	14	52	11	30	8	34
13	13	19				30	22	44	11	24	5	29
14	13	14				29	27	37	11	14	5	510
15	13	15				29	24	36	7	17	4	56
16	13	15	14	17	40	29	22	29	4	22	14	31
17	13	15				29	21	34	2	21	6	26
18	13	15				30	21	29	2	15	4	22
19	13	15				30	21	29	2	12	4	22
20	16	15				29	21	29	1	11	121	21
21	16	14	14	18	65	28	31	26	4	7	320	19
22	18	12				71	29	49	21	2	8	46
23	19	12				66	35	46	27	1	5	9
24	15	12				60	34	36	22	.8	6	148
25	14	11				48	26	30	27	.8	5	24
26	14	11	20	36	46	26	30	27	.6	3	14	16
27	15	11				24	30	21	.5	3	15	16
28	14	11				24	30	21	.5	2	441	15
29	14	10				20	30	21	.5	2	85	14
30	14	9				17	31	19	.4	2	26	13
31	15					17		15		2	26	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	19	5	13.4	824
November	19	9	14.6	869
December			12.4	762
January			16.9	1,040
February	71		30.0	1,670
March	35	17	27.7	1,700
April	49	14	23.1	1,370
May	106	15	39.3	2,420
June	14	.4	6.10	363
July	3,300	.2	118	7,260
August	441	2	59.6	3,660
September	510	8	38.5	2,290
The year	3,300	.2	33.5	24,200

REPUBLICAN RIVER AT MAX, NEBR.

LOCATION.—Staff gage in sec. 32, T. 2 N., R. 36 W., three quarters of a mile south of Max. Zero of gage is 2,873.6 feet above mean sea level.

DRAINAGE AREA.—6,220 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, about 5,620 second-feet Aug. 29 (gage height, 5.20 feet); no flow June 27 to July 8, July 30 to Aug. 1.

1928-33: Maximum, that of Aug. 29, 1933; no flow at times.

REMARKS.—Records fair below and poor above 1,400 second-feet. Discharge estimated Nov. 16-25, Dec. 7 to Feb. 25, on basis of two discharge measurements and temperature records. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	56	151	176	145		222	113	166	104	0	0	1,040	
2	56	146	176			216	128	211	100	0	684	804	
3	56	142	176			244	123	216	91	0	238	1,040	
4	56	137	176			233	113	255	82	0	128	991	
5	65	151	176			142	109	412	38	0	70	756	
6	61	161	176	100		118	95	383	43	0	38	602	
7	59	161	176			161	113	327	35	0	35	514	
8	74	151	170			228	109	206	30	0	37	440	
9	78	137	170			300	104	206	27	900	61	412	
10	109	137	170			273	95	222	24	412	59	392	
11	123	146	135	120		264	95	211	31	238	50	440	
12	113	146				264	109	228	24	156	65	1,940	
13	113	151				255	113	233	24	104	74	1,330	
14	113	161				195	113	233	20	54	40	1,040	
15	118	161				176	100	222	18	43	34	991	
16	118	150	150	150		216	91	211	16	70	30	1,690	
17	109					211	78	166	14	74	30	852	
18	104					200	78	171	10	65	37	672	
19	123					211	70	166	3	54	23	524	
20	118					233	100	146	8	37	22	412	
21	128	160	145	185		228	123	142	7	34	43	327	
22	142					200	200	161	5	30	1,930	309	
23	151					244	238	166	4	31	1,940	273	
24	156					244	228	166	2	30	1,840	238	
25	161					206	176	176	1	45	300	233	
26	161	180	176	200	161	151	171	1	34	1,100	195		
27	151	176				210	166	142	151	0	21	732	195
28	151	176				206	161	146	137	0	14	2,300	195
29	151	171				151	137	109	0	7	5,120	185	
30	151	176				156	142	100	0	0	2,620	190	
31	146					146		100		0	1,610		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	161	56	112	6,890
November	180	137	156	9,280
December	176	-----	153	9,410
January	-----	-----	• 140	8,610
February	210	-----	147	8,160
March	300	118	207	12,700
April	238	70	124	7,380
May	412	100	199	12,200
June	104	0	25.4	1,510
July	900	0	79.1	4,860
August	5,120	0	687	42,200
September	1,940	185	641	38,100
The year	5,120	0	223	161,000

• Estimated.

REPUBLICAN RIVER AT CULBERTSON, NEBR.

LOCATION.—Staff gage in sec. 20, T. 3 N., R. 31 W., three-quarters of a mile south of Culbertson and 2 miles above mouth of Frenchman Creek.

DRAINAGE AREA.—8,790 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, about 18,400 second-feet Aug. 28 (gage height, 8.00 feet); no flow June 26 to July 8, July 29 to Aug. 1.

1931-33: Maximum, that of Aug. 28, 1933; no flow for several days during summer 1931, 1932, 1933.

REMARKS.—Records fair below and poor above 5,000 second-feet. Discharge estimated Nov. 15-20, Dec. 9 to Mar. 5 on basis of two discharge measurements and temperature records. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	62	94	143	-----	-----	150	143	190	80	0	0	684
2.....	58	99	143	-----	-----		134	190	65	0	75	621
3.....	52	94	146	-----	-----		138	248	54	0	445	318
4.....	52	94	150	-----	-----		118	376	52	0	138	505
5.....	52	102	146	-----	-----		125	548	41	0	65	563
6.....	56	117	136	-----	-----	75	134	520	36	0	38	220
7.....	56	129	150	-----	-----	62	130	520	34	0	29	161
8.....	52	129	150	-----	-----	175	125	366	31	0	130	134
9.....	56	129	150	-----	-----	320	118	356	25	18	46	118
10.....	58	129	150	-----	-----	205	110	347	17	481	24	103
11.....	69	126	135	-----	-----	210	92	318	11	210	29	1,180
12.....	73	136		-----	-----	234	78	309	18	152	27	3,530
13.....	75	126		-----	-----	234	78	328	25	99	35	2,210
14.....	73	132		-----	-----	210	83	300	19	60	54	877
15.....	69	132		-----	-----	205	85	241	10	38	26	1,670
16.....	76	110	170	-----	-----	195	88	195	8	28	26	1,920
17.....	78	120		-----	-----	190	78	190	8	25	18	1,010
18.....	69	120		-----	165	175	80	190	8	27	25	592
19.....	69	125		-----	-----	190	67	170	8	23	17	520
20.....	69	130		-----	-----	200	99	152	481	23	175	309
21.....	71	136	165	-----	-----	195	152	152	166	16	20	283
22.....	78	136		-----	170	195	195	138	78	14	60	241
23.....	94	136		-----	-----	205	220	138	48	15	3,840	215
24.....	96	150		-----	-----	220	255	121	38	14	1,700	200
25.....	89	150		-----	-----	227	220	125	32	14	1,030	190
26.....	94	143	150	-----	-----	200	195	156	0	14	1,310	185
27.....	89	143		-----	-----	185	166	148	0	13	752	148
28.....	89	143		-----	-----	170	190	118	0	11	15,000	156
29.....	89	143		-----	-----	156	195	99	0	0	9,710	166
30.....	73	150		-----	-----	134	190	88	0	0	4,640	138
31.....	94	-----	-----	-----	-----	138	-----	88	-----	0	1,180	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	96	52	72.0	4,430
November.....	150	94	127	7,560
December.....	-----	-----	155	9,530
January.....	-----	-----	a 185	11,400
February.....	-----	-----	a 175	9,720
March.....	320	62	182	11,200
April.....	255	67	156	8,090
May.....	548	88	240	14,800
June.....	481	0	46.4	2,760
July.....	481	0	41.8	2,570
August.....	15,000	0	1,310	80,600
September.....	3,530	103	629	38,000
The year.....	15,000	0	277	201,000

a Estimated.

REPUBLICAN RIVER NEAR BLOOMINGTON, NEBR.

LOCATION.—Chain gage in sec. 8, T. 1 N., R. 15 W., 2 miles south of Bloomington. Zero of gage is 1,822.5 feet above mean sea level.

DRAINAGE AREA.—19,000 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 9,260 second-feet Apr. 22 (gage height, 8.00 feet); minimum, 14 second-feet Aug. 2 (gage height, 0.32 foot).

1929-33: Maximum, 11,000 second-feet June 5, 1930 (gage height, 8.54 feet); minimum, that of Aug. 2, 1933.

REMARKS.—Records fair except those for Nov. 13 to Feb. 28, which were estimated on basis two discharge measurements and temperature records. Minor diversions for irrigation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	150		452	774	486	814	376	60	16	2,910
2	41	150		354	696	469	835	360	51	14	2,230
3	42	152		365	650	452	835	313	42	15	1,830
4	49	155		376	612	430	863	275	31	17	1,780
5	49	158		330	605	403	933	249	27	23	1,520
6	52	158			546	360	1,050	213	22	24	1,490
7	62	158			516	392	3,180	201	23	241	1,290
8	62	161		200	516	376	4,000	184	22	174	1,120
9	58	168			452	370	2,950	177	19	280	968
10	62	164		139	425	354	1,920	161	17	123	877
11	68	164			408	339	1,920	158	66	108	761
12	68	168			452	334	2,050	141	77	249	2,310
13	75	150		220	566	318	1,560	138	676	194	4,700
14	82	150			510	308	1,280	128	323	111	4,460
15	94	130			480	294	1,150	128	198	70	4,350
16	90	110			486	328	1,040	125	111	60	1,930
17	86	118			486	289	982	120	220	57	1,380
18	86	108		350	474	280	877	111	504	45	1,230
19	90	120			464	289	828	104	205	42	1,640
20	94	130			492	447	742	88	702	55	1,250
21	94				480	7,290	664	323	257	52	1,140
22	100		418		498	7,670	1,120	1,080	108	184	1,010
23	100	150		550	528	2,860	735	386	82	201	961
24	104				528	1,820	598	436	65	1,360	787
25	113				534	1,340	774	280	84	1,750	650
26	128				522	1,200	664	177	90	1,990	579
27	136			700	546	1,070	546	111	63	1,730	540
28	141	145			566	996	480	96	36	3,860	534
29	136				566	954	425	81	25	2,860	486
30	138				540	1,160	403	77	15	4,560	469
31	144				534		403		21	4,560	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	144	41	86.6	5,320
November	168	108	147	8,750
December			*350	21,500
January			*425	26,100
February		139	376	20,900
March	774	408	531	32,600
April	7,670	280	1,120	66,600
May	4,000	403	1,180	72,600
June	1,080	77	227	13,500
July	702	15	137	8,420
August	4,560	14	807	49,600
September	4,700	469	1,570	93,400
The year	7,670	14	580	419,000

* Estimated.

REPUBLICAN RIVER NEAR HARDY, NEBR.

LOCATION.—Water-stage recorder in sec. 6, T. 1 S., R. 5 W., $1\frac{1}{4}$ miles southwest of Hardy.

DRAINAGE AREA.—20,500 square miles.

RECORDS AVAILABLE.—May 1932 to September 1933.

DISCHARGE.—Maximum during year, about 6,200 second-feet Apr. 22 (gage height, 8.73 feet); minimum, 20 second-feet Oct. 11.

1932-33: Maximum, that of Apr. 22, 1933; minimum, that of Oct. 11, 1932.

REMARKS.—Records fair below and poor above 2,500 second-feet, except those for May 26-31, which were estimated, and Nov. 8 to Mar. 3, which were estimated on basis of three discharge measurements and temperature records. Power plant 8 miles above station regulates flow.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	155				850	556	970	495	124	76	5,220
2	53	163				850	510	1,180	455	102	47	3,650
3	53	167				900	530	1,070	440	95	47	2,800
4	56	167				940	490	841	377	70	42	2,330
5	53	183				796	470	832	344	67	95	2,070
6	42	167				720	450	859	297	56	1,040	1,800
7	37	175				624	455	1,010	279	50	736	1,650
8	30	188				604	455	2,610	252	56	550	1,380
9	33	188				562	432	4,220	221	151	540	1,220
10	47	175				550	470	3,530	204	155	510	1,030
11	20					530	441	3,070	188	53	480	868
12	30					470	441	2,540	167	39	430	823
13	37	150				465	423	2,240	171	252	377	1,290
14	33					505	428	1,850	163	358	325	4,160
15	47					556	418	1,450	139	505	274	5,100
16	59					510	396	1,280	128	435	230	3,840
17	89					490	441	1,140	124	302	183	2,390
18	47	70				510	428	1,050	109	279	151	1,660
19	45					490	432	950	95	688	143	1,400
20	47					535	460	823	105	645	139	1,480
21	61			547		592	1,580	769	116	387	135	1,380
22	135					550	6,060	1,170	86	617	363	1,120
23	226	160				568	5,170	778	192	440	460	980
24	131					617	3,390	1,050	752	325	363	850
25	109					598	2,180	950	455	235	311	744
26	109					562	1,530	650	455	171	931	610
27	113					610	1,210	700	377	151	2,570	568
28	128	155				562	1,050	650	274	163	2,970	530
29	131					568	1,000	575	209	147	4,480	505
30	147					610	1,040	540	221	116	3,990	485
31	139					592		530		70	4,900	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	226	20	75.8	4,660
November	188		147	8,750
December			300	18,400
January			425	26,100
February			405	22,500
March	940	465	609	37,400
April	6,060	396	1,110	66,000
May	4,220	530	1,350	83,000
June	752	86	263	15,600
July	688	39	236	14,500
August	4,900	42	900	55,300
September	5,220	485	1,800	107,000
The year	6,060	20	635	459,000

• Result of discharge measurement.

• Estimated.

REPUBLICAN RIVER AT SCANDIA, KANS.

LOCATION.—Chain gage in NE¼ sec. 17, T. 3 S., R. 4 W., at Scandia, 4 miles below Dry Creek.

DRAINAGE AREA.—23,000 square miles.

RECORDS AVAILABLE.—August 1919 to July 1925; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,620 second-feet Apr. 22 (gage height, 8.50 feet); minimum, 24 second-feet Aug. 4 (gage height, 1.58 feet).

1919-25, 1928-33: Maximum, 16,700 second-feet June 12, 1923 (gage height, 11.4 feet); minimum, 2 second-feet Oct. 9, 15, 16, 1923 (gage height, 1.50 feet). Bank-full stage, 9 feet. Average, 10 years (1919-24, 1928-33), 760 second-feet.

Maximum stage known, 14.2 feet June 30, 1915.

REMARKS.—Records good except those for Oct. 1 to Feb. 28, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	157	198	404		430	892	580	1,260	470	258	63	4,790
2	150	201	326		500	892	540	1,200	470	153	75	3,560
3	142	204	285		430	800	540	1,370	435	126	51	2,640
4	136	204	338		410	845	465	1,040	435	118	40	2,280
5	125	222	306	325	280	845	430	1,040	435	91	62	1,920
6	112	243	338		275	800	372	1,040	340	79	820	1,920
7	110	174	303			755	404	1,100	286	85	135	1,480
8	118	226				665	417	1,150	282	93	68	1,480
9	112	198				540	417	4,510	262	79	2,300	1,260
10	141	194	250	465		540	417	3,870	258	208	1,720	1,150
11	115	194		410	300	540	391	2,700	218	118	1,830	940
12	110			424		540	398	2,700	215	79	315	990
13	112	190		465		465	378	2,060	190	108	243	845
14	112			665		465	384	2,060	204	720	315	3,160
15	126			540		580	404	1,490	204	435	108	4,960
16	129			500		540	410	1,370	184	770	240	3,160
17	132		220	424		540	372	1,200	174	770	174	2,520
18	162			310		540	417	1,150	168	315	156	1,920
19	132			285	400	540	500	1,100	147	435	115	1,480
20	138			465		500	500	985	147	1,720	156	1,370
21	141			540		465	622	1,100	168	675	141	1,480
22	215	200		540	940	580	8,420	1,260	153	435	370	1,320
23	340			500	755	540	6,360	820	135	630	1,040	1,150
24	720			465	580	580	3,870	875	820	435	930	1,040
25	212			465	540	622	2,560	1,480	770	400	370	940
26	165		300	430	622	622	1,940	930	435	229	435	940
27	156			430	910	580	1,490	675	510	150	1,260	710
28	165			430	940	540	1,320	875	315	123	2,400	710
29	190			540		540	1,260	675	254	120	3,290	622
30	159			430		665	1,480	590	226	95	4,150	540
31	194			500		580		630		74	4,150	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	720	110	169	10,400
November	243		201	12,000
December	404		275	16,900
January	665	285	424	26,100
February	940	275	447	24,800
March	892	465	617	38,000
April	8,420	372	1,270	75,500
May	4,510	590	1,430	87,900
June	820	135	310	18,500
July	1,720	74	327	20,100
August	4,150	40	890	54,700
September	4,960	540	1,780	106,000
The year	8,420	40	677	491,000

REPUBLICAN RIVER AT WAKEFIELD. KANS.

LOCATION.—Chain gage in NE¼ sec. 5, T. 10 S., R. 4 E., 25 miles above confluence with Smoky Hill River and a quarter of a mile north of Wakefield.

DRAINAGE AREA.—24,700 square miles.

RECORDS AVAILABLE.—June 1917 to September 1933.

DISCHARGE.—Maximum during year, 7,220 second-feet Apr. 24 (gage height, 8.46 feet); minimum, 57 second-feet Oct. 17 (gage height, 2.14 feet).

1917-33: Maximum, 20,100 second-feet June 4, 1923 (gage height, 12.86 feet); minimum, 8 second-feet Sept. 19, 1931. Bankfull stage, 11 feet. Average, 16 years, 975 second-feet.

REMARKS.—Records fair except those for periods of ice effect, Dec. 7 to Jan. 9, Feb. 7-18, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	143	219	357		490	600	600	1,260	575	280	132	2,870
2.....	122	227	357		490	765	600	1,260	470	242	140	3,980
3.....	122	215	357		490	872	600	1,160	496	212	103	4,260
4.....	136	212	336		515	835	570	1,060	470	186	100	3,000
5.....	85	223	357	* 350	515	910	570	1,160	446	168	82	2,500
6.....	132	208	357		316	910	542	1,060	423	146	72	2,140
7.....	104	223				872	515	980	422	115	94	1,910
8.....	101	234				872	490	905	360	2,020	72	1,800
9.....	97	230				730	490	868	340	575	380	1,470
10.....	114	227		357		695	490	1,790	340	446	795	1,480
11.....	125	234		420		662	465	3,280	320	340	380	1,260
12.....	101	234		296		600	442	2,870	280	223	261	1,060
13.....	101	223		336	* 400	600	465	2,500	280	795	190	1,060
14.....	111	227		316		570	420	2,380	261	300	197	1,580
15.....	132	253		316		515	442	2,020	261	261	204	1,160
16.....	104	257		442		542	442	1,910	242	340	204	2,740
17.....	67	399		378		515	420	1,580	219	360	168	4,120
18.....	94	230		399		630	442	1,680	204	380	154	3,280
19.....	122	208	* 280	465	1,360	542	465	1,260	197	470	172	2,380
20.....	111	208		442	570	570	465	1,160	190	340	190	1,910
21.....	114	238		357	399	542	910	1,060	182	280	168	1,580
22.....	175	208		490	465	542	2,000	905	161	470	164	1,480
23.....	150	223		542	465	570	3,750	905	161	604	360	1,580
24.....	800	276		570	542	600	6,200	980	154	422	2,500	1,260
25.....	600	296		542	695	630	4,260	905	161	380	1,160	1,160
26.....	399	336		515	570	662	3,140	795	150	380	663	1,060
27.....	442	378		515	515	662	2,380	905	300	320	632	980
28.....	316	357		490	515	630	1,910	905	422	300	422	1,160
29.....	276	357		420		600	1,580	694	340	242	632	905
30.....	234	357		442		630	1,370	632	340	201	2,020	694
31.....	219			442		600		632		179	3,280	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	800	67	192	11,800
November.....	399	208	257	15,300
December.....	357		294	18,100
January.....	570	296	408	25,100
February.....	1,360	316	490	27,200
March.....	910	515	660	40,600
April.....	6,200	420	1,250	74,300
May.....	3,280	632	1,340	82,200
June.....	575	150	306	18,200
July.....	2,020	115	386	23,800
August.....	3,280	72	519	31,900
September.....	4,260	694	1,930	115,000
The year.....	6,200	67	667	484,000

* Estimated.

KANSAS RIVER AT OGDEN, KANS.

LOCATION.—Chain gage in SE $\frac{1}{4}$ sec. 12, T. 11 S., R. 6 E., three-quarters of a mile south of Ogden and 10 miles below junction of Smoky Hill and Republican Rivers.

DRAINAGE AREA.—45,200 square miles.

RECORDS AVAILABLE.—June 1917 to September 1933.

DISCHARGE.—Maximum during year, 17,800 second-feet Sept. 13 (gage height, 14.70 feet); minimum, 268 second-feet Aug. 9 (gage height, 4.75 feet).

1917-33: Maximum, 32,600 second-feet June 10, 1923 (gage height, 18.15 feet); minimum, 103 second-feet Oct. 30, 1922. Bankfull stage, 18 feet. Average, 16 years (1917-33), 2,140 second-feet.

REMARKS.—Records good except those for Oct. 23 to Feb. 21, Apr. 21-23, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,100	725	630	• 500	725	898	860	2,060	1,280	545	422	4,640
2.....	1,020	660	600		725	1,010	1,010	1,860	1,110	422	470	9,170
3.....	1,100	630	630		725	1,190	935	1,960	945	380	400	7,690
4.....	1,100	630	630		725	1,190	935	1,760	945	400	400	6,490
5.....	1,100	600	630		760	1,280	898	1,860	870	320	360	5,910
6.....	1,020	630	630	520	600	1,370	860	1,960	795	340	285	5,910
7.....	945	600	572	545		1,280	935	1,760	795	320	302	5,170
8.....	870	600		495		1,280	860	1,860	760	2,380	340	3,800
9.....	725	572		545		1,280	898	1,760	660	3,290	268	3,210
10.....	834	545		572		1,190	822	1,760	572	1,370	470	2,740
11.....	795	545		725		1,100	785	2,740	545	795	870	2,520
12.....	725	600		725		1,100	750	4,080	572	600	495	2,630
13.....	692	545		630		1,010	785	3,440	520	572	400	15,900
14.....	692	572		572	• 600	935	715	3,010	520	692	340	4,640
15.....	760	545		520		935	682	2,740	495	795	870	3,350
16.....	692	545	• 450	545		860	715	2,500	495	520	1,020	2,850
17.....	692	545		692		822	715	2,280	470	572	908	4,990
18.....	660	630		660		860	650	3,290	445	572	834	5,910
19.....	630	572		725		1,100	750	3,440	445	520	660	6,290
20.....	600	545		795		1,010	1,010	2,740	495	630	660	4,470
21.....	600	545		545		898	3,440	3,150	445	572	908	3,210
22.....	600	600		600		1,100	2,380	2,170	445	422	945	2,630
23.....	795	572		600	785	898	4,900	1,760	400	870	1,660	2,410
24.....	795	545		630	750	1,010	10,200	1,660	380	2,270	4,240	2,410
25.....	1,100	572		725	898	1,100	7,650	1,560	380	1,760	7,280	2,000
26.....	945	572		834	1,010	1,010	7,250	1,560	360	1,460	6,680	2,000
27.....	870	600		834	1,010	1,100	6,060	1,460	320	1,020	5,530	1,860
28.....	908	572	• 475	760	860	1,100	4,080	1,660	380	834	4,640	1,860
29.....	870	630		630		1,010	2,880	1,660	545	660	3,800	2,100
30.....	834	660		725		1,010	2,380	1,860	470	545	3,080	1,800
31.....	795			692		1,010		1,560		495	3,960	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,100	600	834	51,300
November.....	725	545	590	35,100
December.....	630		493	30,300
January.....	834		624	38,400
February.....	1,010		697	38,700
March.....	1,370	822	1,060	65,500
April.....	10,200	650	2,260	134,000
May.....	4,080	1,460	2,220	137,000
June.....	1,280	320	595	35,400
July.....	3,290	320	869	53,400
August.....	7,280	268	1,740	107,000
September.....	15,900	1,800	4,350	259,000
The year.....	15,900	268	1,360	985,000

• Estimated.

KANSAS RIVER AT WAMEGO, KANS.

LOCATION.—Chain gage in SE¼ sec. 9, T. 10 S., R. 10 E., at Wamego, 3 miles below Antelope Creek.

DRAINAGE AREA.—54,900 square miles.

RECORDS AVAILABLE.—January 1919 to September 1933. Intermittent observations made by United States Weather Bureau 1914-19.

DISCHARGE.—Maximum during year, 19,800 second-feet Sept. 14 (gage height, 9.6 feet); minimum, 480 second-feet Aug. 12 (gage height, 1.5 feet).

1919-33: Maximum, 53,400 second-feet May 8, 1930 (gage height, 16.3 feet); minimum, 330 second-feet in October 1922. Bank-full stage, 15 feet. Average, 14 years 3,530 second-feet.

REMARKS.—Records good except those for periods of ice effect, Dec. 8 to Feb. 20, and those for Nov. 6 to Dec. 7, which are fair. Small diurnal fluctuation in flow caused by operation of power plant on the Big Blue River at Manhattan. Gage-height record furnished by United States Weather Bureau.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,980	1,360	980	1,200	1,080	1,290	1,680	2,610	3,220	980	720	5,470
2.....	1,850	1,360	980		1,080	1,180	1,410	2,610	2,320	1,080	650	9,380
3.....	1,590	1,260	980		1,080	1,180	1,290	2,270	1,700	890	590	12,000
4.....	1,590	1,260	980		1,080	1,180	1,290	2,110	1,700	890	590	8,520
5.....	1,590	1,260	980		1,080	1,540	1,290	2,780	1,700	800	590	6,940
6.....	1,590	1,120	980	1,290	1,080	1,540	1,290	2,780	1,700	800	530	6,520
7.....	1,590	1,120	980	1,290		1,540	1,290	2,610	1,560	800	590	6,100
8.....	1,360	1,120	1,050	1,290		1,540	1,290	2,270	1,430	2,000	590	5,270
9.....	1,360	1,120		1,290		1,540	1,180	1,960	1,430	5,470	530	4,470
10.....	1,360	1,020		1,290		1,410	1,180	1,960	1,430	3,320	530	4,470
11.....	1,360	1,020		1,290	1,200	1,410	1,080	2,270	1,190	1,960	530	3,320
12.....	1,360	1,020		1,410		1,540	1,080	4,080	1,190	980	530	2,960
13.....	1,360	1,020		1,410		1,540	1,080	3,700	1,190	800	800	4,870
14.....	1,360	1,020		1,410		1,540	1,080	3,700	1,190	890	530	16,600
15.....	1,360	1,020		1,410		1,540	1,080	3,320	1,190	980	530	6,100
16.....	1,360	1,020	1,050	1,410	1,290	1,540	1,080	3,320	1,080	1,820	650	4,870
17.....	1,360	1,020		1,290		1,540	1,080	2,960	1,080	1,680	1,410	5,270
18.....	1,360	1,020		1,290		1,410	980	4,670	980	1,540	1,180	6,310
19.....	1,160	1,020		1,290		1,410	980	7,220	890	1,410	1,180	6,310
20.....	1,070	1,020		1,290		1,410	980	5,900	890	1,410	980	5,680
21.....	1,070	890	1,050	1,290	1,290	1,410	1,820	5,050	890	1,180	890	4,670
22.....	1,070	890		1,290	1,290	1,290	6,100	4,220	800	1,180	1,180	4,080
23.....	1,070	890		1,290	1,290	1,290	5,470	5,680	800	1,680	1,960	3,140
24.....	980	890		1,290	1,180	1,680	6,940	4,840	720	980	6,940	2,960
25.....	1,070	890		1,180	1,180	1,680	8,800	4,630	720	2,610	16,900	2,780
26.....	1,590	890	1,050	1,180	1,410	1,820	6,520	3,820	720	2,110	15,900	2,610
27.....	1,360	890		1,180	1,410	1,680	6,520	3,420	720	1,680	11,000	5,270
28.....	1,360	980		1,080	1,290	1,820	5,270	3,420	800	1,540	8,020	6,310
29.....	1,360	980		1,080	-----	1,680	3,510	3,420	800	1,080	6,940	4,470
30.....	1,360	980		1,080	-----	1,680	2,610	4,220	980	980	5,890	4,080
31.....	1,360	-----	-----	1,080	-----	1,540	-----	4,630	-----	800	4,870	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,980	980	1,370	84,500
November.....	1,360	890	1,050	62,200
December.....	-----	980	1,030	63,600
January.....	1,410	1,080	1,260	77,300
February.....	1,410	1,080	1,200	66,900
March.....	1,820	1,180	1,500	92,000
April.....	8,800	980	2,670	153,000
May.....	5,900	1,960	3,630	223,000
June.....	3,220	720	1,280	73,400
July.....	5,470	800	1,490	92,000
August.....	16,900	530	3,060	188,000
September.....	16,600	2,610	5,730	341,000
The year.....	16,900	530	2,090	1,520,000

KANSAS RIVER AT TOPEKA, KANS.

LOCATION.—Chain gage in Topeka, about 1½ miles above Soldier Creek.

DRAINAGE AREA.—56,400 square miles.

RECORDS AVAILABLE.—April to August 1904; June 1917 to September 1933.

DISCHARGE.—Maximum during year, 16,400 second-feet Aug. 26 (gage height, 10.1 feet); minimum, 710 second-feet Aug. 6, 11, 17 (gage height, 2.1 feet).
1917-33: Maximum, 73,700 second-feet June 10, 1923 (gage height, 21.5 feet); minimum, 480 second-feet in January 1925. Average, 16 years 4,040 second-feet.

REMARKS.—Records fair except those estimated for periods of ice effect, Dec. 9 to Jan. 3, Feb. 7-22, which are poor. Gage-height record furnished by United States Weather Bureau.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	2,430	1,370	1,250	1,200	1,350	1,550	1,660	4,040	4,760	870	1,000	5,010
2.....	2,270	1,370	1,160		1,350	1,550	1,550	3,500	3,510	930	870	5,200
3.....	1,840	1,170	1,250		1,350	1,450	1,550	3,320	2,600	930	810	11,500
4.....	1,710	1,170	1,250		1,350	1,550	1,550	2,960	2,120	930	810	11,200
5.....	1,710	1,170	1,250		1,350	1,660	1,550	3,500	1,840	870	760	8,770
6.....	1,710	1,170	1,250	1,350	1,250	1,910	1,550	3,500	1,840	810	710	6,970
7.....	1,710	1,140	1,160	1,450		1,910	1,450	3,320	1,590	760	760	6,570
8.....	1,480	1,140	1,160	1,250		1,910	1,450	3,500	1,480	930	810	6,370
9.....	1,480	1,140		1,250		1,910	1,450	3,140	1,480	2,270	870	5,010
10.....	1,480	1,140		1,250		1,910	1,350	3,140	1,370	5,670	760	4,250
11.....	1,480	1,170		1,250		1,910	1,350	2,960	1,370	3,700	710	3,890
12.....	1,370	1,170		1,350		1,780	1,350	2,960	1,370	2,120	810	3,350
13.....	1,370	1,170		1,350		1,660	1,250	4,400	1,170	1,270	1,170	3,530
14.....	1,170	1,170		1,250		1,550	1,160	4,760	1,170	1,000	1,000	7,770
15.....	1,170	1,170		1,160	1,300	1,550	1,160	4,400	1,170	1,090	810	14,800
16.....	1,170	1,090		1,160		1,550	1,160	4,040	1,090	1,170	760	5,970
17.....	1,170	1,090		1,350		1,450	1,160	3,860	1,090	1,370	710	5,010
18.....	1,090	1,170		1,350		1,450	1,090	3,680	1,000	1,710	1,270	4,070
19.....	1,090	1,170		1,350		1,450	1,090	6,960	1,000	1,590	1,170	6,170
20.....	1,090	1,170	1,100	1,350		1,450	2,190	7,360	930	1,370	1,090	6,770
21.....	1,090	1,270		1,350		1,450	4,580	5,560	930	1,370	1,090	6,170
22.....	1,090	1,170		1,350		1,450	7,780	4,400	1,000	1,270	930	4,820
23.....	1,090	1,170		1,250	1,450	1,450	5,960	5,160	870	1,270	1,170	4,250
24.....	1,090	1,170		1,250	1,550	1,550	5,560	6,960	870	1,000	2,270	3,530
25.....	1,170	1,270		1,250	1,550	1,660	7,160	5,160	870	1,090	7,750	3,180
26.....	1,270	1,270		1,350	1,450	1,780	9,490	4,960	870	2,430	16,400	3,180
27.....	1,270	1,170		1,450	1,450	1,780	7,570	4,220	870	2,120	12,400	2,840
28.....	1,480	1,170		1,350	1,550	1,780	5,360	3,860	1,000	1,710	9,380	6,370
29.....	1,480	1,250		1,350		1,780	6,160	3,500	930	1,590	7,970	6,570
30.....	1,370	1,250		1,350		1,910	4,760	3,500	870	1,270	7,370	4,630
31.....	1,370			1,350		1,780		5,160		1,090	5,770	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2,430	1,090	1,410	86,800
November.....	1,370	1,090	1,190	70,800
December.....	1,250		1,130	69,500
January.....	1,450	1,160	1,310	80,400
February.....	1,550	1,250	1,350	75,000
March.....	1,910	1,450	1,660	102,000
April.....	9,490	1,090	3,080	183,000
May.....	7,860	2,960	4,250	261,000
June.....	4,760	870	1,430	85,300
July.....	5,670	760	1,530	94,400
August.....	16,400	710	2,910	179,000
September.....	14,800	2,840	5,920	353,000
The year.....	16,400	710	2,260	1,640,000

KANSAS RIVER AT BONNER SPRINGS, KANS.

LOCATION.—Chain gage in NW¼ sec. 32, T. 11 S., R. 23 E., at Bonner Springs, half a mile below Wolf Creek.

DRAINAGE AREA.—59,600 square miles.

RECORDS AVAILABLE.—July 1917 to September 1933.

DISCHARGE.—Maximum during year, 16,300 second-feet Aug. 27 (gage height, 8.78 feet); minimum, 745 second-feet Aug. 18 (gage height, 2.63 feet).

1917-33: Maximum, 110,000 second-feet Apr. 21, 1929 (gage height, 22.20 feet); minimum, 650 second-feet Jan. 1925. Average, 16 years 5,180 second-feet.

REMARKS.—Records good except those for Dec. 12 to Mar. 25, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3,150	1,650	1,270	1,160	1,270	1,650	1,990	4,710	4,940	1,270	1,270	6,320
2.....	2,550	1,520	1,160	1,270	1,390	1,650	1,990	4,020	4,940	900	1,650	5,630
3.....	2,550	1,520	1,270	1,810	1,390	1,650	1,650	3,580	4,020	900	1,650	7,050
4.....	2,360	1,520	1,160	1,990	1,390	1,520	1,650	3,150	3,150	5,400	1,160	13,000
5.....	2,360	1,520	1,270	1,990	1,270	1,520	1,270	3,150	2,550	5,400	980	11,300
6.....	2,170	1,390	1,270	1,390	1,300	1,810	1,390	3,580	2,170	900	900	8,990
7.....	1,990	1,270	1,270	1,390		2,170	1,520	3,580	2,170	825	825	7,580
8.....	1,990	1,390	1,270	1,390		1,990	1,270	3,360	1,810	900	825	7,050
9.....	1,990	1,390	980	1,390		2,360	1,390	3,360	1,810	900	980	6,800
10.....	1,650	1,270	980	1,390		2,170	1,390	3,150	1,650	4,710	900	5,860
11.....	1,990	1,270	980	1,270	1,300	2,170	1,390	4,480	1,650	5,400	980	5,170
12.....	1,650	1,390	1,150	1,270		1,990	1,270	5,860	1,650	4,480	825	4,710
13.....	1,650	1,270		1,270		1,990	1,270	7,310	1,520	3,150	825	5,400
14.....	1,650	1,270		1,270		1,810	1,270	5,630	1,390	1,990	1,160	5,170
15.....	1,650	1,270		1,270		1,650	1,160	5,170	1,390	1,270	1,270	9,920
16.....	1,390	1,220	1,150	1,060	1,350	1,650	1,060	4,480	1,270	1,520	980	11,900
17.....	1,390	1,160		1,270		1,810	1,060	4,250	1,270	1,160	825	6,800
18.....	1,650	1,160		1,270		1,650	1,160	9,290	1,160	1,390	755	5,860
19.....	1,390	1,270		1,390		1,650	1,060	11,600	1,060	1,650	900	5,170
20.....	1,390	1,160		1,390		1,520	2,360	8,420	1,160	1,810	1,520	6,800
21.....	1,390	1,160	1,200	1,390	1,990	1,520	4,020	13,000	1,060	1,650	2,170	7,310
22.....	1,390	1,270		1,390		1,390	8,420	7,310	980	1,270	2,950	7,580
23.....	1,270	1,270		1,270		1,650	7,860	6,560	980	1,520	1,650	6,320
24.....	1,270	1,160		1,520		1,650	6,560	6,320	980	1,160	1,390	4,940
25.....	1,390	1,160		1,390		1,810	5,630	10,200	980	1,270	1,990	4,250
26.....	1,390	1,390	1,200	1,390	1,990	2,750	7,580	12,300	980	1,060	6,560	3,580
27.....	1,390	1,270		1,390	1,520	2,750	8,140	6,090	980	1,810	15,900	3,800
28.....	1,650	1,160		1,390	1,650	2,360	6,800	4,940	980	2,360	13,000	5,400
29.....	1,990	1,270		1,650	-----	1,810	6,800	6,320	980	1,990	9,600	8,420
30.....	1,650	1,160		1,270	-----	1,810	6,090	6,320	1,270	1,650	8,420	7,310
31.....	1,650	-----	-----	1,520	-----	2,750	-----	4,480	-----	1,520	7,580	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3,150	1,270	1,770	109,000
November.....	1,650	1,160	1,300	77,700
December.....	1,270	980	1,170	72,100
January.....	1,990	1,060	1,400	86,200
February.....	1,990	1,270	1,420	78,900
March.....	2,750	1,390	1,890	116,000
April.....	8,420	1,060	3,220	191,000
May.....	13,000	3,150	6,000	369,000
June.....	4,940	980	1,760	105,000
July.....	5,400	825	2,040	125,000
August.....	15,900	755	2,980	183,000
September.....	13,000	3,580	6,850	407,000
The year.....	15,900	755	2,650	1,920,000

• Estimated.

• Interpolated.

NORTH FORK OF REPUBLICAN RIVER AT COLORADO-NEBRASKA LINE

LOCATION.—Staff gage in sec. 10, T. 1 N., R. 42 W., 100 feet east of Colorado-Nebraska line.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, 213 second-feet July 9 (gage height, 3.27 feet); minimum, 6 second-feet June 18, 19 (gage height, 1.84 feet*).

1931-33: Maximum, 378 second-feet July 30, 1932 (gage height, 3.5 feet); no flow Aug. 25, 26, 1932.

REMARKS.—Records good except those for Dec. 8 to Feb. 26, Mar. 5-8, which were estimated on basis of two discharge measurements and temperature records. Small diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	50	49	87			70	67	67	16	7	7	48
2.	55	50	88			67	69	70	14	8	7	46
3.	52	55	88		75	62	66	74	16	8	7	58
4.	38	52	85			67	64	111	16	8	7	60
5.	39	52	78			70	62	108	12	8	7	52
6.	41	52	85			40	56	104	8	8	7	50
7.	46	52	88			50	49	94	10	8	7	48
8.	50	52	85		50	60	45	80	12	9	110	42
9.	46	52	85			80	46	75	9	192	15	39
10.	41	64	85			80	48	80	8	139	12	43
11.	39	70				77	45	83	8	69	10	46
12.	38	67				77	36	83	9	48	10	78
13.	35	70	75		60	72	22	77	11	42	10	78
14.	34	74				70	24	77	11	38	10	74
15.	36	80				67	27	69	8	27	10	58
16.	36	87				62	21	64	7	27	13	70
17.	38	87				62	16	61	7	29	10	62
18.	33	90	80		65	60	14	61	6	27	10	52
19.	30	87				62	12	61	6	23	10	49
20.	33	87		76		60	22	58	7	24	10	48
21.	35	87			70	62	38	58	8	19	10	54
22.	35	83			74	66	83	55	7	15	152	61
23.	43	80	78			62	83	55	7	12	75	62
24.	62	82			75	62	66	74	7	10	69	58
25.	61	83				60	46	56	7	9	54	55
26.	52	83			76	64	41	38	7	8	50	55
27.	49	83			77	64	34	29	7	7	82	54
28.	46	87	78		75	70	43	38	7	7	77	49
29.	46	83				67	61	33	7	7	77	42
30.	46	83				64	69	28	7	7	74	35
31.	48					61		23		7	64	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	62	30	43	2, 640
November	90	49	72.1	4, 290
December	88		80.2	4, 930
January			76	4, 670
February			66	3, 670
March	80	40	65.1	4, 000
April	83	12	45.8	2, 730
May	111	23	65.9	4, 050
June	16	6	9.1	541
July	192	7	27.6	1, 700
August	152	7	34.6	2, 130
September	78	35	54.2	3, 230
The year	192	6	53.3	38, 600

* Estimated.

FRENCHMAN CREEK NEAR CHAMPION, NEBR.

LOCATION.—Water-stage recorder in sec. 19, T. 6 N., R. 39 W., $2\frac{1}{2}$ miles west of Champion.

DRAINAGE AREA.—1,020 square miles.

RECORDS AVAILABLE.—July 1932 to September 1933.

DISCHARGE.—Maximum during year, 71 second-feet July 9 and Aug. 29 (gage height, 2.34 feet); minimum, 10 second-feet Nov. 8 and Apr. 1 (gage height, 1.73 feet).

REMARKS.—Records fair except those for periods Dec. 8–27, Feb. 5–12, which were estimated. Diversions for irrigation above station.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	30	36	23	41	41	30	11	26	21	65	25	31
2.....	29	35	23	40	41	25	14	19	21	57	26	31
3.....	27	34	23	40	41	26	14	16	21	33	26	27
4.....	26	33	24	39	42	32	19	23	22	40	25	24
5.....	25	33	25	39	42	35	26	22	26	52	21	25
6.....	24	33	25	41	25	35	21	24	30	57	24	24
7.....	24	28	29	40		30	15	27	33	64	19	25
8.....	24	10	20	40		30	17	29	44	65	13	26
9.....	25	14	18	41		35	18	38	35	67	13	27
10.....	25	16	16	41		41	16	43	31	63	12	27
11.....	24	17	16	41	40	41	16	43	31	58	11	31
12.....	23	19		40	46	41	16	42	29	53	12	42
13.....	23	19		40	42	33	18	43	29	43	12	40
14.....	23	19		41	42	23	19	42	26	52	12	34
15.....	22	19		41	42	21	29	42	14	56	12	34
16.....	24	20	20	42	45	20	30	38	12	59	17	33
17.....	23	20		41	50	20	27	26	12	50	16	29
18.....	22	20		41	48	20	19	19	12	39	16	28
19.....	21	21		41	46	20	18	19	12	40	15	31
20.....	20	21		41	45	20	22	20	20	43	16	29
21.....	31	22	25	41	47	19	37	18	32	46	18	34
22.....	37	22		41	49	20	42	19	34	48	20	33
23.....	34	22		41	46	20	37	26	34	45	22	33
24.....	34	22		41	46	20	30	29	33	37	22	32
25.....	33	22		41	44	19	27	20	34	33	21	32
26.....	35	23	30	41	41	19	24	20	34	30	40	31
27.....	38	23	32	41	39	16	24	20	39	30	45	30
28.....	37	22	35	41	37	13	25	20	53	28	49	31
29.....	35	22	35	41	-----	14	26	20	60	29	65	32
30.....	35	22	35	41	-----	14	27	20	64	27	47	31
31.....	35	-----	38	41	-----	13	-----	20	-----	29	37	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	38	20	28.0	1,720
November.....	36	10	23.0	1,370
December.....	38	-----	23.7	1,460
January.....	42	39	40.7	2,500
February.....	49	-----	40.2	2,230
March.....	41	12	24.7	1,520
April.....	42	11	22.8	1,360
May.....	43	16	26.9	1,650
June.....	64	12	29.9	1,780
July.....	67	27	46.4	2,850
August.....	65	11	23.5	1,440
September.....	42	24	30.6	1,820
The year.....	67	10	30.0	21,700

FRENCHMAN CREEK NEAR HAMLET, NEBR.

LOCATION.—Water-stage recorder in sec. 19, T. 5 N., R. 34 W., 1 mile east of Hamlet. Zero of gage is 2,798.43 feet above mean sea level.

DRAINAGE AREA.—1,420 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 572 second-feet Sept. 11 (gage height, 6.00 feet); minimum, 52 second-feet Aug. 16, 20 (gage height, 1.10 feet).

1929-33: Maximum, 1,080 second-feet Aug. 9, 1931 (gage height, 10.0 feet); minimum, 49 second-feet Nov. 21, 1931 (gage height, 1.18 feet).

REMARKS.—Records fair. Discharge estimated Dec. 8 to Jan. 6 Feb. 6-21, Mar. 8-17, on the basis of one discharge measurement and temperature records. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	97	104	103	115	106	129	98	107	87	79	60	142
2.....	97	110	107		106	127	97	106	79	78	69	142
3.....	99	107	107		106	122	95	104	84	72	79	115
4.....	100	106	107		107	119	95	106	81	71	75	119
5.....	91	106	105		106	115	91	108	77	64	75	117
6.....	96	106	106	130	107	97	90	105	79	75	75	115
7.....	102	109	107	141	90	94	91	103	73	78	77	113
8.....	99	105	60	134	75	85	90	105	71	73	101	111
9.....	100	108	65	135	64	90	95	103	73	80	79	93
10.....	107	104	70	130	70	95	95	107	74	79	79	93
11.....	101	103	75	133	100	100	94	107	73	77	79	238
12.....	99	103		133			92	112	77	71	69	134
13.....	103	98		129			95	118	87	73	66	133
14.....	101	102		129			99	117	86	80	65	141
15.....	99	100		127			95	118	87	79	67	133
16.....	90	101	85	127	120	105	96	114	79	133	59	125
17.....	104	99		123		110	95	116	75	84	63	120
18.....	103	100		127		115	99	115	67	85	63	119
19.....	105	103		126		113	102	111	71	87	60	116
20.....	102	103		121		111	113	104	64	87	56	116
21.....	99	104	90	117	135	110	116	99	61	83	60	114
22.....	93	102		112	152	111	124	95	61	84	73	114
23.....	99	105		106	149	109	126	92	77	77	81	112
24.....	103	105		101	145	109	127	89	77	78	207	110
25.....	102	105		106	142	108	131	104	77	79	229	110
26.....	106	103	100	107	138	107	125	103	75	77	102	106
27.....	106	106		107	136	106	122	95	76	78	106	108
28.....	106	106		106	129	105	116	94	73	76	178	104
29.....	107	105		106	-----	103	113	94	62	70	306	102
30.....	107	107		107	-----	102	110	88	75	66	299	100
31.....	109	-----	-----	103	-----	101	-----	83	-----	65.	208	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	109	90	101	6,210
November.....	110	98	104	6,190
December.....	107	60	89.9	5,530
January.....	141	101	119	7,320
February.....	152	64	113	6,280
March.....	129	85	106	6,520
April.....	131	90	104	6,190
May.....	118	83	104	6,400
June.....	87	61	75.3	4,480
July.....	133	64	78.6	4,830
August.....	306	56	105	6,460
September.....	238	93	120	7,140
The year.....	306	56	102	73,600

FRENCHMAN CREEK AT CULBERTSON, NEBR.

LOCATION.—Staff gage in sec. 17, T. 3 N., R. 31 W., at Culbertson.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—June 1913 to September 1915, March 1931 to September 1933.

DISCHARGE.—Maximum during year, 1,730 second-feet Aug. 28 (gage height, 7.00 feet); minimum, 12 second-feet July 25 (gage height, 1.00 foot).

1931-33: Maximum, that of Aug. 28, 1933; minimum, 9 second-feet Sept. 9, 10, 1932 (gage height, 1.00 foot).

REMARKS.—Records fair. Discharge estimated Dec. 6 to Mar. 15, on the basis of two discharge measurements and temperature records. Diversions for irrigation above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	59	143				165	89	33	29	33	341
2	40	60	143				163	89	29	29	49	302
3	42	63	143			220	151	85	25	28	25	250
4	41	63	143				141	100	16	29	20	238
5	43	63	143				139	121	16	31	23	203
6	58	70	143			190	141	123	16	28	21	187
7	58	74				185	145	125	19	24	22	157
8	51	74				181	145	118	20	37	395	135
9	50	74	140			165	143	129	16	40	105	127
10	50	74				175	147	135	13	30	41	112
11	50	74					139	139	18	24	35	205
12	44	75					139	133	25	17	32	560
13	41	75	110			190	139	135	32	18	25	374
14	42	69					141	137	29	17	21	308
15	44	69					147	139	24	18	21	285
16	43	68				189	141	125	19	16	23	248
17	43	143				185	145	119	29	21	18	228
18	45	114	125			178	121	109	35	18	18	203
19	45	133		196		192	97	109	36	18	21	196
20	45	143				196	112	95	33	18	21	194
21	47	143				205	114	91	19	17	21	165
22	48	143			257	214	131	86	20	17	30	149
23	48	143	135			216	170	88	21	34	33	145
24	50	153				209	161	75	21	18	110	139
25	53	143				212	159	68	21	12	174	141
26	62	143				216	145	58	31	20	230	133
27	57	143				209	129	63	33	24	97	135
28	54	143	150			205	112	53	31	13	1,200	131
29	54	143				194	102	43	29	32	389	129
30	60	143				189	99	41	28	30	464	123
31	61					185		35		29	446	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	62	40	48.7	2,990
November	153	59	103	6,130
December			134	8,240
January			• 180	11,100
February			• 200	11,100
March		165	198	12,200
April	170	97	137	8,150
May	139	35	98.5	6,060
June	36	13	24.6	1,460
July	40	12	23.7	1,460
August	1,200	18	134	8,240
September	560	112	208	12,400
The year	1,200	12	124	89,500

• Estimated.

SMOKY HILL RIVER AT ELLSWORTH, KANS.

LOCATION.—Chain gage in SE¼ sec. 20, T. 15 S., R. 8 W., at Ellsworth, 2 miles below Turkey Creek.

DRAINAGE AREA.—7,580 square miles.

RECORDS AVAILABLE.—April 1895 to October 1905; July 1918 to July 1925; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,260 second-feet Sept. 1 (gage height, 13.77 feet); minimum, 21 second-feet July 7 (gage height, 1.32 feet).

1895-1905, 1918-25, 1928-33: Maximum, 21,000 second-feet July 5, 1895; minimum, 1.6 second-feet Oct. 8, 9, 1922. Bank-full stage, 20 feet. Average, 11 years (1918-24, 1928-33), 207 second-feet.

A flood stage of 25.0 feet was reached in August 1927 (discharge, about 24,000 second-feet).

REMARKS.—Records good except those for periods of ice effect, Dec. 8, 9, 12-24, Feb. 7-17, and those for October, Feb. 18 to May 7, July 1 to Aug. 8, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	54	42	42	33	37	30	57	46	31	64	6,150
2	109	54	42	38	33	35	29	53	54	26	59	3,710
3	116	54	42	38	33	33	27	51	54	31	59	2,300
4	109	49	42	42	30	37	29	53	46	26	54	1,650
5	102	49	42	42	33	38	27	64	46	24	54	1,360
6	95	49	42	42	35	38	29	62	42	24	54	1,110
7	95	49	42	35	37	29	64	41	21	59	875	
8	88	49	40	38	35	29	102	38	29	59	762	
9	82	49	38	35	27	167	36	42	689	617		
10	82	49	49	42	35	27	142	31	36	2,880	582	
11	82	49	42	38	33	29	126	33	30	1,550	513	
12	82	49	33	30	36	29	112	33	26	1,070	513	
13	82	49	35	35	35	27	105	32	59	689	448	
14	82	49	35	32	29	98	32	29	547	3,150		
15	88	45	42	33	29	92	32	218	417	2,120		
16	140	42	38	33	33	28	86	29	46	358	1,110	
17	108	42	33	33	33	29	80	29	36	316	762	
18	70	49	40	38	34	33	28	69	37	2,000	617	
19	59	49	38	44	34	29	64	27	264	240	513	
20	54	49	38	46	29	50	64	25	218	2,240	448	
21	59	45	38	47	32	33	59	27	150	316	387	
22	59	49	38	40	33	26	64	26	126	2,000	358	
23	59	49	38	39	32	29	59	26	86	2,560	330	
24	59	45	35	39	29	37	54	25	119	1,760	303	
25	59	45	49	35	37	28	41	59	26	105	2,820	277
26	59	45	49	35	39	29	40	59	25	98	837	252
27	59	45	49	35	38	28	41	59	50	92	725	229
28	59	45	42	35	37	28	64	54	46	86	653	2,000
29	54	45	42	35	29	65	54	40	80	953	480	
30	54	45	42	35	29	54	50	37	74	1,940	264	
31	54	42	35	27	50	69	3,220					

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	140	54	79.8	4,910
November	54	42	47.8	2,850
December	49	41.9	2,580	
January	42	35	37.4	2,300
February	47	34.5	1,920	
March	38	27	32.7	2,010
April	65	26	34.0	2,020
May	167	50	75.2	4,620
June	54	25	35.7	2,120
July	2,000	21	139	8,630
August	3,220	54	952	58,500
September	6,150	229	1,140	67,800
The year	6,150	21	221	160,000

SMOKY HILL RIVER AT LINDSBORG, KANS.

LOCATION.—Chain gage in NE¼ sec. 20, T. 17 S., R. 3 W., on highway bridge at Lindsborg.

DRAINAGE AREA.—8,100 square miles.

RECORDS AVAILABLE.—February 1930 to September 1933.

DISCHARGE.—Maximum during year, 6,300 second-feet Aug. 24 (gage height, 23.88 feet); minimum not determined.

1930-33: Maximum, that of Aug. 24, 1933; minimum, 22 second-feet Sept. 20, 30, 1931.

Maximum stage known, 31.5 feet in May 1903.

REMARKS.—Records fair. Gage-height record Oct. 1 to June 30 furnished by United States Weather Bureau.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	226	95	80	69	76	60	51	54	53	25	60	2,640
2.....	215	95	80	72	76	60	51	54	53		56	4,320
3.....	204	95	80	72	76	60	51	54	47		56	4,520
4.....	193	90	80	72	76	60	51	54	47		56	2,360
5.....	183	90	80	76	76	60	51	69	47		47	1,820
6.....	164	90	76	76	76	60	51	69	47	32	50	1,390
7.....	164	90	76	76	76	60	51	69	47		44	1,170
8.....	155	90	76	76	69	60	51	66	47		41	899
9.....	155	90	72	76	51	60	45	66	47		41	754
10.....	146	90	72	76		60	45	66	47		41	678
11.....	137	85	69	76	50	57	45	66	47	28	2,150	604
12.....	137	85	69	76	51	57	45	108	47	25	1,420	586
13.....	129	85	69	76		57	45	95	47	35	853	716
14.....	129	85	69	76		57	45	90	41	28	678	678
15.....	137	85	69	76		57	45	85	41	25	460	1,660
16.....	137	85	66	76	51	57	45	85	35	71	364	2,320
17.....	137	85	66	76	54	57	45	85	30	114	380	1,170
18.....	129	85	66	76	54	57	45	95	30	129	332	792
19.....	129	85	66	76	57	57	45	76	30	754	288	678
20.....	122	85	66	76	57	57	45	72	30	496	792	568
21.....	115	85	66	76	60	57	45	80	25	204	4,040	496
22.....	115	85	66	76	63	57	45	80	25	149	697	460
23.....	108	85	66	76	63	54	45	76	25	139	3,440	428
24.....	108	80	69	76	63	54	45	76	25	129	5,990	396
25.....	108	80	69	76	63	54	45	75	25	112	3,050	348
26.....	101	80	69	76	63	54	48	139	25	114	2,900	300
27.....	101	80	69	76	63	54	48	101	25	96	1,630	300
28.....	95	80	69	76	63	54	48	60	25	92	968	532
29.....	95	80	69	76	54	54	51	60	25	88	735	3,130
30.....	95	80	69	76		54	51	53	25	71	792	830
31.....	95	69	76	76	54	54	53	53	67	67	1,730	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	226	95	138	8,460
November.....	95	80	86.0	5,120
December.....	80	66	70.9	4,360
January.....	76	69	75.4	4,640
February.....	76	-----	61.6	3,420
March.....	60	54	57.1	3,510
April.....	51	45	47.3	2,810
May.....	139	53	75.2	4,620
June.....	53	25	37.0	2,200
July.....	754	-----	104	6,390
August.....	5,990	41	1,100	87,800
September.....	4,520	300	1,250	74,500
The year.....	5,990	-----	259	188,000

SMOKY HILL RIVER AT SOLOMON, KANS.

LOCATION.—Chain gage in SE¼ sec. 19, T. 13 S., R. 1 E., 500 feet below Solomon River and 1 mile south of Solomon.

DRAINAGE AREA.—18,700 square miles.

RECORDS AVAILABLE.—April to July 1904; October 1922 to September 1933.

DISCHARGE.—Maximum during year, 6,750 second-feet Aug. 25 (gage height, 16.8 feet); minimum, 86 second-feet July 9, 10, Aug. 9-12 (gage height, 2.9 feet).

1904, 1922-33: Maximum, 18,400 second-feet Aug. 10, 1928 (gage height, 28.0 feet); minimum, 25 second-feet Oct. 14, 1925. Bank-full stage, 24.0 feet. Average, 11 years (1922-33), 985 second-feet.

Maximum stage known, about 35.0 feet during flood of 1903.

REMARKS.—Records fair. Discharge estimated during periods of ice effect, Dec. 7-23, Feb. 4-21. Gage-height records furnished by United States Weather Bureau.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	612	308	192	202	180	224	202	476	351	105	232	1,970
2	638	308	192	202	202	270	202	451	254	105	210	3,590
3	664	260	192	202	202	247	180	451	232	105	166	3,700
4	772	284	192	202		224	180	376	232	86	145	3,860
5	508	284	148	180		247	180	476	277	86	145	4,260
6		456	236	148	180	224	158	552	254	105	125	3,260
7		431	236		180	270	180	578	210	105	105	1,870
8		284	214		202	247	180	526	145	105	125	1,720
9		356	192		180	247	158	476	125	145	86	1,330
10		308	192		180	320	137	476	145	210	86	1,140
11		406	192		180	224	158	660	145	125	86	986
12		332	214		180	202	158	578	145	145	86	920
13		308	192		180	180	158	526	188	145	1,190	986
14		308	192		202	137	137	501	188	125	1,260	1,820
15		332	192		180	158	137	476	166	125	831	1,190
16		332	214		180	137	137	426	166	125	773	986
17		284	214		180	158	158	426	145	145	605	3,920
18		260	214		180	202	137	976	145	105	526	3,980
19		308	170		180	202	202	1,860	105	125	476	1,920
20		332	148		180	202	831	1,060	105	166	451	1,330
21		356	170		202	158	1,000	552	105	251	660	1,020
22		406	126		202	137	4,060	552	105	1,700	2,980	920
23		456	105		202	180	158	2,040	605	105	1,400	3,580
24		508	126	202	202	180	137	1,540	578	105	1,040	5,560
25		308	105	202	202	180	202	3,420	426	125	632	6,750
26		284	192	202	202	180	247	2,600	401	105	476	4,820
27		431	170	202	180	180	224	1,060	376	105	401	4,480
28		482	170	202	180	180	202	605	688	105	226	3,480
29		431	148	202	202		180	552	716	166	232	2,440
30		356	126	202	202		158	501	451	125	188	1,520
31		308		202	180		158		326		188	1,230

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	772	260	405	24,900
November	308	105	196	11,700
December	202	148	185	11,400
January	202	180	191	11,700
February	202	158	184	10,200
March	320	137	203	12,500
April	4,060	137	712	42,300
May	1,860	326	581	35,700
June	351	105	162	9,670
July	1,700	86	305	18,700
August	6,750	86	1,460	89,700
September	4,260	642	1,740	104,000
The year	6,750	86	528	382,000

SALINE RIVER NEAR WILSON, KANS.

LOCATION.—Water-stage recorder in SW¼ sec. 11, T. 13 S., R. 11 W., three-quarters of a mile above Hell Creek and 8 miles northwest of Wilson.

DRAINAGE AREA.—1,900 square miles.

RECORDS AVAILABLE.—May 1929 to September 1933.

DISCHARGE.—Maximum during year, 1,000 second-feet July 17 (gage height, 6.70 feet); minimum, 4 second-feet Aug. 12-15.

1929-33: Maximum, 4,140 second-feet Sept. 10, 1930 (gage height, 13.50 feet); minimum, that of Aug. 12-15, 1933. Bank-full stage, about 20 feet.

REMARKS.—Records fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	86	39	37			51	32	32	35	11	10	15
2	86	40	39			49	34	32	36	11	10	14
3	80	42	39			51	29	36	33	10	11	14
4	74	39	39	• 29	• 37	44	27	49	32	10	10	14
5	71	39	40			49	27	48	32	9	9	12
6	69	37	37			49	24	49		8	8	10
7	68	37	23			40	21	72	• 25	8	7	9
8	64	37	31	29		40	20	79	18	11	7	7
9	61	42	34	39		40	23	76	18	12	6	9
10	56	37	35	42		40	23	74	19	10	6	9
11	56	35	37		• 30	40	21	67	19	9	6	9
12	56	35	37			39	21	64	16	9	4	14
13	57	35	39	• 35		40	26	56		17	4	9
14	52	34	39			40	26	51		39	4	38
15	66	• 30	35	49		42	24	52	• 15	19	4	85
16	54	26	34	51		40	24	49		18	5	46
17	49	37	35	21	76	40	21	48	14	• 586	6	33
18	80	47	34	44	62	39	24	46	12	• 385	6	25
19	71	52	34	54	52	37	21		11	• 76	19	18
20	59	49	32	46	52	29	22		14	• 16	39	15
21	52	44	29	49	51	29	25		11	• 16	38	12
22	51	40	27	46	59	26	28		11	• 16	52	11
23	59	39	27	46	59	27	52	39	10	18	109	11
24	61	32		49	59	31	40	39	8	15	92	11
25	56	34		47	40	31	38	40	8	16	39	9
26	51	32			51	29	36	40	9	14	22	8
27	47	32	• 26	• 45	49	32	33	40	10	14	25	8
28	47	34			51	34	32	40	11	14	17	104
29	44	34		52		34	31	40	15	11	16	38
30	42	32		47		37	29	40	12	11	16	25
31	42			47		34		38		11	14	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	86	42	60.2	3,700
November	52	26	37.4	2,230
December	40	23	32.3	1,990
January	54		39.9	2,450
February	76		42.0	2,330
March	51	26	38.2	2,350
April	52	20	27.8	1,650
May	79	32	48.3	2,970
June	36	8	17.5	1,040
July	586	8	46.1	2,840
August	109	4	20.0	1,230
September	104	7	21.4	1,270
The year	586	4	36.0	26,000

• Estimated.

• Interpolated.

• Partly estimated.

SALINE RIVER AT TESCOTT, KANS.

LOCATION.—Chain gage in SE¼ sec. 16, T. 12 S., R. 5 W., half a mile south of Tescott and half a mile above Dry Creek.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—September 1919 to September 1933.

DISCHARGE.—Maximum during year, 395 second-feet July 21 (gage height, 9.16 feet); minimum, 2 second-feet July 8 (gage height, 2.24 feet).

1919-33: Maximum, 6,150 second-feet July 12, 1928 (gage height, 29.48 feet); minimum, 0.5 second-foot in July 1926. Bank-full stage, 25 feet. Average, 14 years, 150 second-feet.

REMARKS.—Records fair. Discharge estimated during periods of ice effect, Dec. 4 to Jan. 13, Feb. 6-22.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	105	50	50		38	44	36	36	32	28	38	46
2.....	95	50	50		44	44	38	48	47	11	14	46
3.....	95	53	41		36	44	38	48	34	11	13	30
4.....	95	53			41	47	44	46	21	8	13	20
5.....	100	56			44	34	38	56	14	23	14	15
6.....	90	50	• 40	• 50		29	44	45	13	22	12	12
7.....	90	44				41	35	38	26	9	13	11
8.....	85	53				38	32	36	31	3	13	16
9.....	85	56				44	44	60	35	8	13	20
10.....	85	53				35	32	60	10	10	11	21
11.....	72	50				36	23	52	34	8	11	14
12.....	76	50				38	28	60	12	7	21	19
13.....	80	44				38	36	60	9	12	27	48
14.....	76	53		50	• 35	44	30	68	21	9	11	29
15.....	76	56		76		41	26	60	12	7	12	13
16.....	90	56	• 45	72		35	30	60	5	5	11	11
17.....	123	53		53		34	23	56	9	7	10	24
18.....	170	56		47		36	27	52	8	7	8	17
19.....	104	41		56		47	48	56	8	10	12	44
20.....	84	47		41		38	68	44	18	129	8	35
21.....	84	35		56		44	207	46	18	347	7	34
22.....	68	60		56		47	104	56	27	163	14	32
23.....	60	60		60	32	38	302	42	29	80	24	29
24.....	53	60		44	32	47	117	56	30	48	105	28
25.....	56	50		41	44	35	56	50	23	30	68	28
26.....	53	50	• 50	38	44	35	45	50	15	36	56	17
27.....	60	53		38	47	35	64	47	7	40	64	21
28.....	64	50		30	47	35	56	47	21	33	129	21
29.....	64	41		36		44	52	44	7	22	117	24
30.....	64	47		32		36	46	38	30	19	60	24
31.....	56			34		44		50		25	42	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	170	53	82.5	5,070
November.....	60	35	51.0	3,030
December.....	50		45.8	2,820
January.....	76	30	48.7	3,000
February.....	47	32	37.3	2,070
March.....	47	29	39.6	2,430
April.....	302	23	59.0	3,510
May.....	68	36	50.5	3,110
June.....	47	7	20.2	1,200
July.....	347	3	38.0	2,330
August.....	129	7	31.3	1,930
September.....	48	11	25.0	1,490
The year.....	347	3	44.2	32,000

• Estimated.

• Interpolated.

SOLOMON RIVER AT BELOIT, KANS.

LOCATION.—Water-stage recorder in SW¼ sec. 9, T. 7 S., R. 7 W., at highway bridge in Beloit, 93 miles above junction with Smoky Hill River.

DRAINAGE AREA.—5,410 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 5,320 second-feet Apr. 2^d (gage height, 18.50 feet); minimum, 1 second-foot at times of low flow, during which power plant is shut down.

1929-33: Maximum, 11,900 second-feet June 8, 1929 (gage height, 26.40 feet); minimum, 1 second-foot at times of low flow, during which power plant is shut down.

REMARKS.—Records fair. Power plant about 200 feet upstream regulates low-water flow.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	129		40	1	35	38	51	• 150	72	5	51	125
2	87		18	5	21	21	47		66	16	11	72
3	113		33	1	11	• 35	44	142	81	12	9	
4	7	• 40	33	1	25	31	62	95	62	5	8	
5	50		24	1	7	1	63	87	69	3	25	• 20
6	13		35	5	45	43	39	163	74	4	12	
7	52	24		2		36	43	306	38	4	24	
8	41	32		7	• 30	45	60	352	73	16	13	
9	11	41		20		35	273	25	6	22		56
10	47	10		24	30	38	• 50	214	34	5	12	8
11	10	35		6	60	72	23	189	25	4	22	22
12	43	8	• 30	30	57	24	60	189	28	3	10	10
13	11	26		7	63	63	20	179	20	24	8	35
14	41	44		23	62	33	67	136	38	2	34	1,560
15	35	7		26	58	51	34	243	28	30	11	1,430
16	19	37		32	51	48	44	224	8	10	7	366
17	253	8	7	34	49	27	25	189	6	16	6	229
18	248	40	19	28	48	72	58	152	5	155	6	134
19	108	10	36	34	49	36	32	169	10	1,630	5	77
20	72	45	32	26	26	39	62	139	27	1,230	6	67
21	74	24	30	34	16	30	243	123	5	352	43	43
22	78	15	28	22	26	32	4,290	214	4		45	50
23	153	34	27	57	48	31	2,900	152	24		50	69
24	380	45	13	28	61	46	652	74	5	• 140	366	9
25	196	20	24	35	58	63	325	108	28		229	55
26		16	2	48	38	40		68	14	37	202	8
27		35	1	41	69	69		115	14	37	196	45
28		20	1	13	33	46	• 190	75	14	16	229	46
29		45	2	40		63		85	12	11	134	11
30		18	1	26		45		66	26	29	306	12
31			1	56		61		91		32	273	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	380	7	84.7	5,210
November	45	7	29.3	1,740
December	40	1	22.8	1,400
January	57	1	23.0	1,410
February	69	7	40.6	2,250
March	72	1	42.8	2,630
April	4,290	23	343	20,400
May	352	66	158	9,740
June	81	4	31.2	1,850
July	1,630	2	137	8,440
August	366	5	76.6	4,710
September	1,560	8	155	9,240
The year	4,290	1	95.4	69,000

• Estimated.

SOLOMON RIVER AT NILES, KANS.

LOCATION.—Chain gage in NW¼ sec. 31, T. 12 S., R. 1 W., three-quarters of a mile west of Niles and 7 miles above mouth.

DRAINAGE AREA.—6,710 square miles.

RECORDS AVAILABLE.—May 1897 to November 1903; May 1919 to September 1933.

DISCHARGE.—Maximum during year, 3,720 second-feet Apr. 25 (gage height, 16.08 feet); minimum, 30 second-feet July 14, 17.

1897-1903, 1919-33: Maximum, 10,600 second-feet June 3, 1903; minimum, 1 second-foot Sept. 4, 1926. Bank-full stage, 22 feet. Average, 14 years (1919-33), 405 second-feet.

REMARKS.—Records fair. Stage-discharge relation affected by ice, Dec. 7-22, Feb. 5-19.

Discharge, in second-feet, 1932-33.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	180	91	58		78	60	75	176	98	37	50	395
2	322	91	55		81	60	72	176	98	37	50	365
3	267	78	48		66	63	72	166	113	39	62	321
4	216	72	41		63	60	78	157	105	39	66	293
5	204	66	45	55		69	75	196	98	39	66	241
6		130	60	50		81	63	241	113	41	66	206
7		113	63			81	60	217	105	41	66	176
8		105	63		60	81	55	253	81	39	62	132
9		105	63		66	75	50	350	75	41	58	132
10		98	60	• 40	72	69	50	427	66	41	54	98
11		91	63		66	60	50	350	60	39	54	86
12		91	60		63	63	55	293	60	39	54	125
13		81	60		60	60	52	229	69	32	58	658
14		91	60		60	72	58	196	63	30	54	279
15		91	60		60	91	55	166	63	32	58	321
16		91	63		66	78	58	166	60	32	54	774
17		84	60	• 45	69	81	58	157	60	30	58	1,680
18		84	60		75	69	60	307	58	33	58	679
19		81	58		75	63	63	196	58	33	58	294
20		84	60		75	58	105	166	58	32	58	216
21		91	60		75	60	294	157	55	395	54	180
22		158	60		78	63	991	148	55	1,340	66	148
23		98	58		63	63	484	148	55	564	1,040	91
24		91	58		63	66	2,460	140	60	307	2,060	78
25		84	91		63	69	3,140	180	55	176	601	69
26		78	85	• 50	78	60	1,400	204	55	140	206	78
27		78	58		72	60	60	380	204	58	92	206
28		84	58		66	60	60	350	254	48	71	241
29		105	55		72		58	266	241	45	66	639
30		113	58		78		58	186	158	43	50	546
31		98			78		75		130		50	443

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	322	78	119	7,310
November	91	55	64.2	3,820
December	58		46.5	2,860
January	78		65.7	4,040
February	81	58	65.3	3,630
March	91	58	67.3	4,140
April	3,140	50	374	22,200
May	427	130	211	13,000
June	113	43	69.7	4,150
July	1,340	30	128	7,890
August	2,060	50	234	14,400
September	1,680	41	278	16,600
The year	3,140	30	144	104,000

• Estimated.

BIG BLUE RIVER AT BARNSTON, NEBB.

LOCATION.—Water-stage recorder in sec. 13, T. 1 N., R. 7 E., 1 mile south of Barnston. No important tributary between station and State line, 4 miles downstream.

DRAINAGE AREA.—4,350 square miles.

RECORDS AVAILABLE.—May 1932 to September 1933.

DISCHARGE.—Maximum during year, 5,550 second-feet Aug. 23 (gage height, 13.28 feet); no flow when reservoir gates are closed at power plant upstream.

1932-33: Maximum, 7,210 second-feet June 4, 1932 (gage height, 16.23 feet); no flow when reservoir gates are closed at power plant upstream.

REMARKS.—Records good. Discharge estimated during periods of ice effect, Dec. 13-15, Feb. 8-11. Low-water flow regulated by power plant at Barnston, which has pondage of about 1,500 acre-feet.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	264	191	106	169	186	162	312	336	258	110	58	186
2.....	102	104	114	172	131	172	270	489	220	44	64	343
3.....	87	191	207	144	122	204	261	497	204	84	133	280
4.....	98	114	151	108	181	199	296	516	174	59	51	186
5.....	94	162	194	172	76	122	276	474	229	69	66	160
6.....	258	87	176	160	91	196	226	428	155	66	47	151
7.....	186	164	114	184	191	267	270	360	155	67	155	108
8.....	267	162	85	108	144	147	158	417	194	153	246	108
9.....	59	176	94	162	129	232	155	350	189	114	149	122
10.....	140	114	160	158	133	125	223	226	110	179	149	62
11.....	131	176	147	127	140	218	207	176	75	410	59	87
12.....	84	106	116	149	191	118	151	160	153	442	64	336
13.....	84	149	114	202	151	129	136	316	127	501	59	704
14.....	58	160	116	184	223	215	127	174	129	1,060	73	305
15.....	140	169	127	127	149	120	142	267	131	1,010	80	240
16.....	61	110	196	153	100	176	80	240	155	648	78	261
17.....	73	104	212	158	112	140	120	160	252	453	64	142
18.....	67	114	160	96	172	186	110	162	78	392	59	199
19.....	156	144	189	191	118	237	118	147	147	218	91	435
20.....	151	114	229	184	118	252	122	122	129	296	100	186
21.....	80	189	189	162	158	258	243	1,030	94	535	162	194
22.....	140	114	207	155	94	169	176	716	100	474	207	140
23.....	147	142	270	125	153	179	179	744	153	302	2,540	155
24.....	176	135	234	162	136	267	196	823	160	299	4,190	160
25.....	158	176	120	106	162	249	181	497	78	189	2,600	160
26.....	232	179	229	215	108	326	158	410	127	58	2,250	656
27.....	149	106	196	249	194	464	149	360	151	56	2,240	438
28.....	140	169	162	174	158	322	151	1,930	75	55	1,430	478
29.....	276	169	158	174	-----	309	116	857	69	75	900	326
30.....	118	93	147	110	-----	276	184	319	78	62	660	140
31.....	179	-----	184	151	-----	246	-----	196	-----	75	209	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	276	58	140	8,610
November.....	191	87	143	8,510
December.....	270	85	165	10,100
January.....	249	96	158	9,720
February.....	223	76	144	8,000
March.....	464	118	216	13,300
April.....	312	80	183	10,900
May.....	1,930	122	449	27,600
June.....	258	69	145	8,630
July.....	1,060	44	276	17,000
August.....	4,190	47	620	38,100
September.....	704	62	248	14,800
The year.....	4,190	44	242	175,000

BIG BLUE RIVER AT HULL, KANS.

LOCATION.—Water-stage recorder in NW¼ sec. 3, T. 2 S., R. 7 E., e. quarter of a mile west of Hull and 2 miles above Deer Creek.

DRAINAGE AREA.—4,510 square miles.

RECORDS AVAILABLE.—August 1919 to July 1925; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 6,700 second-feet Aug. 23 (gage height, 14.60 feet); minimum, 50 second-feet Nov. 12.

1919-25, 1928-33: Maximum, 14,500 second-feet Oct. 3, 1923 (gage height, 20.8 feet); minimum, 2 second-feet Sept. 8, 14, 1922 (gage height, 1.20 feet). Bank-full stage, 22 feet. Average, 10 years (1919-24, 1928-33), 540 second-feet.

Maximum stage known, 31.7 feet in May 1903.

REMARKS.—Records good except those for Oct. 1 to Mar. 25, July 10, 11, Aug. 29-30, Sept. 27-30, which are fair. Stage-discharge relation affected by ice during January and February. Flow slightly regulated by power plants upstream.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	356	287	184	} • 200	226	211	366	351	235	105	121	239
2.....	271	258	205		190	224	324	579	235	131	113	536
3.....	153	217	258		190	249	306	596	203	92	166	377
4.....	176	261	277		219	251	339	613	235	106	109	217
5.....	183	246	261		350	226	309	579	169	90	85	207
6.....	279	209	258	} • 180	186	188	241	528	197	95	103	201
7.....	298	209	230			301	263	444	159	93	117	176
8.....	353	241				226	208	444	175	118	280	154
9.....	249	233				274	182	381	190	161	208	154
10.....	127	209				203	206	286	159	• 175	184	139
11.....	207	211		} • 200		261	230	201	117	• 190	135	119
12.....	195	174				256	186	197	119	2 0	96	1,650
13.....	157	213				183	162	366	147	412	121	1,950
14.....	142	181				271	169	283	142	894	90	536
15.....	192	235				224	188	292	141	1,150	133	350
16.....	195	188		} • 230	244	246	169	345	142	768	103	440
17.....	143	181			244	217	150	208	222	579	113	318
18.....	159	179			315	226	166	252	157	461	95	233
19.....	159	188			424	301	166	246	102	351	92	773
20.....	215	192			279	290	161	180	138	333	144	424
21.....	504	221		} • 177	377	333	263	930	133	545	169	304
22.....	287	211			209	249	227	1,000	105	545	444	266
23.....	290	184			233	235	269	786	105	301	4,170	217
24.....	197	226			233	324	177	1,040	157	366	4,280	371
25.....	241	213			221	368	220	613	146	306	2,970	217
26.....	285	261			258	221	182	477	111	162	2,220	} • 1,400
27.....	230	228			310	193	562	169	428	152	102	
28.....	213	235			258	244	444	167	1,490	149	109	
29.....	338	263			296		381	182	1,110	98	130	
30.....	251	217			176		342	289	494	315	119	
31.....	181				217		321	184			106	235

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	504	127	234	14,400
November.....	288	174	219	13,000
December.....	277	184	209	12,800
January.....	310	176	218	13,400
February.....	424		229	12,700
March.....	562	183	285	17,500
April.....	366	150	221	13,200
May.....	1,490	184	514	31,600
June.....	315	98	162	9,630
July.....	1,150	90	303	18,600
August.....	4,280	85	735	45,200
September.....	3,150	119	644	38,300
The year.....	4,280	85	332	240,000

• Estimated.

BIG BLUE RIVER AT RANDOLPH, KANS.

LOCATION.—Chain gage in SW¼ sec. 12, T. 7 S., R. 6 E., at Randolph, half a mile above Fancy Creek.

DRAINAGE AREA.—8,860 square miles.

RECORDS AVAILABLE.—April 1918 to September 1933.

DISCHARGE.—Maximum during year, 11,700 second-feet Aug. 24 (gage height, 14.45 feet); minimum, 222 second-feet Aug. 8 (gage height, 2.31 feet).

1918-33: Maximum, 29,900 second-feet May 8, 1930 (gage height, 22.79 feet); minimum, 175 second-feet Aug. 9, 1926 (gage height, 2.26 feet). Bank-full stage, 20 feet. Average, 15 years (1918-33), 1,240 second-feet.

Maximum stage known, 31.7 feet May 31, 1903.

REMARKS.—Records good except those estimated for periods of ice effect, Dec. 8 to Jan. 9, Feb. 7-21 and those for Apr. 4-20, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	521	379	427		410	443	543	443	693	295	282	1,020
2	521	427	394		410	427	543	543	615	282	269	845
3	521	461	394		427	410	591	880	615	282	269	3,100
4	443	410	365		410	410	521	820	543	269	282	1,160
5	410	427	427	* 440	269	461	521	880	521	239	322	684
6	365	394	410		379	480	543	820	480	262	295	540
7	394	427	427			443	521	1,060	480	257	262	429
8	501	394				461	461	720	427	820	246	388
9	480	427				543	480	640	394	566	501	388
10	521	427		461		443	443	693	410	427	521	349
11	379	427	* 400	379		461	410	640	410	336	336	292
12	379	394		365		461	461	501	394	350	308	349
13	394	410		379		443	461	443	379	427	308	4,250
14	379	394		394	* 430	410	443	501	379	591	252	2,990
15	379	410		501		394	410	591	365	990	252	1,440
16	379	427		521		443	427	443	365	1,310	282	1,160
17	394	480		427		410	443	1,720	336	870	269	736
18	350	365		443		427	394	2,660	336	880	269	634
19	394	350		443		394	427	1,940	410	720	252	540
20	350	379		427		427	443	760	308	666	259	540
21	394	410		480		427	880	591	295	480	282	684
22	394	410		461	480	443	880	4,670	322	615	336	472
23	394	443		461	521	480	693	3,150	308	693	3,050	450
24	666	410	* 420	461	461	427	591	2,560	282	591	11,600	388
25	566	394		427	480	521	521	1,860	308	461	9,770	368
26	521	394		443	443	820	480	1,580	322	501	5,510	2,690
27	501	394		410	443	760	480	1,440	308	427	3,830	6,350
28	521	410		461	394	760	461	1,120	295	336	3,200	2,790
29	410	394		501		720	461	3,350	322	295	2,400	1,900
30	427	410		461		640	443	2,460	336	295	1,670	963
31	521			427		591		1,380		282	1,290	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	666	350	444	27,300
November	480	350	409	24,400
December	427	365	412	25,300
January	521	365	442	27,200
February	521	269	428	23,600
March	820	394	496	30,500
April	880	394	513	30,500
May	4,670	443	1,350	83,000
June	693	282	399	23,700
July	1,310	239	610	31,400
August	11,600	246	1,580	97,100
September	6,350	292	1,300	77,100
The year	11,600	239	692	501,000

* Estimated.

LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.

LOCATION.—Water-stage recorder in sec. 6 (revised), T. 1 N., R. 3 E., 1½ miles above Rose Creek and 1½ miles southwest of Endicott.

DRAINAGE AREA.—2,590 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933. At point several miles upstream May 1908 to September 1915.

DISCHARGE.—Maximum during year, 2,710 second-feet Aug. 22 (gage height, 7.56 feet); minimum, 45 second-feet Aug. 15 (gage height, -0.17 foot).

1908-15, 1929-33: Maximum, 13,700 second-feet June 6-7, 1908; minimum, 16 second-feet Sept. 28, 1931 (discharge measurement).

REMARKS.—Records good except those for period of ice effect, Dec. 8 to Jan. 5, Feb. 6-20, which were estimated on the basis of temperature records. No diversions. Diurnal fluctuations caused by operation of power dams above.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	109	134	119	121	142	123	136	314	150	89	84	189
2	107	132	120	124	142	120	138	235	136	78	84	189
3	107	132	121	132	144	117	134	184	132	75	82	168
4	107	132	123	138	127	113	134	177	132	75	78	160
5	103	139	128	150	100	126	138	163	128	74	82	145
6	109	127	123	163	113	136	139	155	126	73	91	144
7	112	133	102	155	113	138	139	145	124	72	94	145
8	103	132	103	150	113	133	138	153	119	76	96	138
9	110	133	103	160	109	132	138	150	114	83	107	128
10	112	132	103	158	106	130	139	150	113	89	96	124
11	113	126	96	142	106	130	139	148	103	163	95	119
12	112	124	90	142	105	128	136	150	110	153	87	136
13	116	126	92	153	106	132	136	148	102	166	85	348
14	112	132	98	158	107	128	136	148	99	84	82	201
15	117	121	102	161	113	127	134	147	102	172	79	203
16	114	91	105	150	126	128	133	147	95	366	76	177
17	119	110	109	139	130	128	130	158	90	167	79	184
18	144	121	114	128	134	126	128	153	89	269	75	184
19	138	138	120	161	138	132	126	140	85	165	79	180
20	128	150	124	158	139	128	130	139	84	126	91	160
21	126	144	128	160	150	134	150	158	86	121	84	150
22	142	133	130	163	165	134	153	606	87	112	741	138
23	189	127	132	163	170	139	155	342	87	120	2,110	138
24	201	128	130	150	152	160	152	685	87	124	1,120	128
25	160	130	128	145	140	153	235	748	86	109	1,280	128
26	155	120	128	145	132	145	215	627	84	69	418	374
27	147	116	128	144	128	142	180	288	92	65	286	147
28	136	119	127	144	124	140	170	222	107	64	267	132
29	138	117	124	145	-----	139	160	269	89	60	244	124
30	130	120	123	139	-----	139	322	179	83	69	226	126
31	134	-----	113	145	-----	138	-----	165	-----	84	205	-----

Month	Maximum	Minimum	Mean	Run-off in acre feet
October	201	103	127	7,810
November	150	91	127	7,580
December	132	90	116	7,130
January	163	121	148	9,100
February	170	100	128	7,110
March	153	113	132	8,120
April	322	126	153	9,100
May	748	139	245	15,100
June	150	83	104	6,190
July	306	72	115	7,070
August	2,110	75	281	17,300
September	374	119	170	10,100
The year	2,110	72	154	112,000

LITTLE BLUE RIVER AT WATERVILLE, KANS.

LOCATION.—Chain gage in SE¼ sec. 16, T. 4 S., R. 6 E., half a mile north of Waterville and 1 mile below Corn Creek.

DRAINAGE AREA.—3,390 square miles.

RECORDS AVAILABLE.—June 1922 to June 1925; August 1928 to September 1933.

DISCHARGE.—Maximum during year, 10,100 second-feet Aug. 24 (gage height, 16.65 feet); minimum, 79 second-feet Aug. 18, 19 (gage height, 1.92 feet).

1922-25; 1928-33: Maximum, about 13,200 second-feet July 13, 1923; maximum gage height, 16.65 feet Aug. 24, 1933; minimum discharge, 76 second-feet in December 1924.

REMARKS.—Records fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	127	154	154		182	182	200	230	303	98	92	345
2	120	145	154		191	191	200	431	251	105	92	1,450
3	120	154	154		173	182	200	348	216	98	85	790
4	120	154	154			182	200	275	204	98	85	422
5	120	145	154	• 200		200	200	287	184	98	85	316
6	120	154	154			210	200	275	174	92	92	277
7	136	154				220	200	252	164	92	85	251
8	120	154				210	190	241	154	112	105	251
9	120	154		254		200	190	230	145	120	112	227
10	120	154		231		200	190	230	136	105	98	216
11	127	145		279	• 160	200	190	220	136	98	105	204
12	127	154				191	190	220	136	112	92	264
13	127	154				191	190	230	127	184	92	1,090
14	127	154				191	190	220	127	164	98	670
15	136	154		• 200		191	190	220	120	154	85	1,000
16	145					200	190	209	120	127	85	488
17	145	140				191	190	584	112	251	85	330
18	136					200	190	491	120	239	79	290
19	136	227	• 170		318	210	190	298	112	216	79	290
20	154	194		191	292	200	209	241	105	194	105	264
21	145	184		210	254	209	209	287	105	164	112	239
22	145	184		220	279	209	322	287	105	136	710	204
23	390	164		200	266	220	298	873	105	127	6,570	204
24	330	154		210	242	230	264	616	105	127	9,720	184
25	264	154		191	220	348	252	830	105	127	3,800	174
26	216	154		191	210	298	264	916	98	126	1,980	4,360
27	184	145		182	191	241	298	616	105	112	916	1,800
28	174	154		191	191	230	264	1,040	105	105	670	1,650
29	164	154		182		209	252	1,060	112	98	556	592
30	154	154		182		209	230	1,060	112	92	454	316
31	154			182		200		488		85	390	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	390	120	158	9,720
November	227		157	9,370
December		154	167	10,300
January	279	182	203	12,500
February	318		193	10,700
March	348	182	211	13,000
April	322	190	218	13,000
May	1,090	209	447	27,500
June	303	98	140	8,340
July	251		131	8,040
August	9,720	79	894	55,000
September	4,360	174	639	38,000
The year	9,720	79	298	215,000

• Estimated.

SOLDIER CREEK AT TOPEKA, KANS.

LOCATION.—Chain gage in NW¼ sec. 18, T. 11 S., R. 16 (revised) E., at State Industrial School, in Topeka.

DRAINAGE AREA.—304 square miles.

RECORDS AVAILABLE.—May 1929 to September 1933.

DISCHARGE.—Maximum during year, 800 second-feet May 19 (gage height, 7.90 feet); no flow Aug. 1.

1929-33: Maximum, 5,780 second-feet Nov. 17, 1931 (gage height, 19.36 feet); no flow July 29, 1931, and Aug. 1, 1933.

REMARKS.—Records poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.			
1.....	23	33	16	• 12	13	17	^b 9	24	14	4	0	3			
2.....	14	46			11	16	9	24	14	3	4	3			
3.....	12	37			27	11	18	19	12	3	4	5			
4.....	12	40			15	10	^b 18	15	12	3	3	4			
5.....	14	50			10	12	18	27	12	1	10	3			
6.....	10	40	• 10	• 11	• 16	• 45	16	24	11	2	3	2			
7.....	14	46				• 40	^b 17	30	9	1	4	1			
8.....	12	64				37	18	30	9	3	5	2			
9.....	12	56				^b 30	16	^b 27	8	277	4	1			
10.....	14	43				24	14	24	8	171	6	2			
11.....	12	46	• 10	• 11	20	16	18	19	7	37	10	2			
12.....	29	28				18	29	24	10	^b 38	7	3			
13.....	37	17				^b 17	14	20	7	40	7	3			
14.....	37	19				^b 16	13	20	6	18	4	4			
15.....	26	22				11	16	12	14	4	2	5	8		
16.....	29	22	• 15	• 15	• 16	^b 16	12	^b 12	3	5	2	2			
17.....	27	32				16	15	10	3	14	4	1			
18.....	27	20				^b 16	9	85	5	16	3	2			
19.....	32	32				• 12	• 16	10	17	8	410	2	6	2	3
20.....	32								16	64	2	5	5	2	2
21.....	25	• 18	• 12	• 16	10	• 18	550	72	3	5	5	6			
22.....	31						164	46	1	5	5	3			
23.....	30						80	99	2	6	6	6			
24.....	32						56	131	2	5	7	2			
25.....	34						40	56	^b 2	4	8	4			
26.....	26	37	37	• 16	9	150	24	37	1	2	43	11			
27.....	33				20	26	27	20	2	10	8	7			
28.....	34				16	^b 22	18	20	76	10	8	114			
29.....	37				18	• 16	16	20	68	26	2	4	40		
30.....	37						18	26	46	^b 10	2	3	10		
31.....	37						9	9	27	1	1	2	2		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	37	10	25.2	1,550
November	64		26.2	1,740
December			12.4	762
January	18		15.7	845
February	27	9	15.3	849
March	150	9	26.6	1,640
April	550	8	42.4	2,590
May	410	10	46.8	3,060
June	76	1	9.43	561
July	277	1	22.6	1,390
August	43	0	6.16	379
September	114	1	8.63	514
The year	550	0	27.9	15,900

• Estimated.

^b Interpolated.

DELAWARE RIVER AT VALLEY FALLS, KANS.

LOCATION.—Chain gage in SW¼ sec. 18, T. 8 S., R. 18 E., at Valley Falls, 500 feet below Walnut Creek.

DRAINAGE AREA.—922 square miles.

RECORDS AVAILABLE.—June 1922 to September 1933.

DISCHARGE.—Maximum during year, 4,290 second-feet May 2° (gage height, 10.48 feet); minimum, 5 second-feet Aug. 13-16, 18-20.

1922-33: Maximum, 30,000 second-feet June 16, 1925 (gage height, 29.72 feet); minimum, 1.3 second-feet Oct. 28, 1922 (gage height, 1.49 feet). Bank-full stage, 22 feet. Average, 11 years, 354 second-feet.

REMARKS.—Records good except those for Dec. 14 to Apr. 19, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	47	33	49		66	50	65	53	71	74	10	15
2.....	42	34	48		54	53	51	48	62	22	12	18
3.....	44	34	51		40	50	43	47	54	16	16	15
4.....	42	36	48		25	49	43	47	44	11	18	15
5.....	33	37	48			63	51	108	41	10	15	15
6.....	30	37	48	• 40								
7.....	26	41	29			126	49	122	35	10	16	12
8.....	31	53	27			175	42	93	29	13	26	12
9.....	40	63	27			138	37	74	26	2,300	34	12
10.....	45	58	20			106	37	58	25	1,130	28	11
						343	33	50	22	77	25	9
11.....	50	48	18	44	• 25		62	29	48	19	39	15
12.....	54	43	12	49		65	28	54	27	27	54	9
13.....	50	41	13	51		72	26	53	26	23	5	44
14.....	41	42		43		62	34	49	20	21	5	20
15.....	35	37		48		61	27	44	16	20	5	12
16.....	31	17		79		56	27	40	15	15	5	10
17.....	30	34		66		51	28	40	14	10	6	7
18.....	31	34		79		41	29	2,550	13	12	5	69
19.....	31	36	• 25		75		30	229	13	13	5	188
20.....	27	35		77	100		115	115	12	12	5	83
21.....	23	45		79	96	• 55		245	393	9	10	7
22.....	26	48		77	117		175	229	9	9	10	25
23.....	29	49		71	126	68	126	512	9	8	9	20
24.....	34	42		59	115	138	93	215	10	9	11	16
25.....	40	43		54	98	175	72	102	9	8	15	13
26.....	37	39		47	75	175	62	74	10	9	37	512
27.....	35	31	• 90		35	62	104	56	61	12	7	36
28.....	34	41		31	56	62	49	3,790	1,690	7	30	215
29.....	33	45		45		51	53	880	215	7	32	138
30.....	33	49		56		51	59	201	96	8	29	65
31.....	31			65		72		80		8	20	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	54	23	36.0	2,200
November.....	63	17	40.8	2,430
December.....		12	43.3	2,660
January.....	80	31	52.7	3,240
February.....	126	25	52.0	2,890
March.....	343	41	88.4	5,430
April.....	245	26	60.5	3,600
May.....	3,790	40	337	20,700
June.....	1,690	9	88.4	5,260
July.....	2,300	7	127	7,820
August.....	54	5	17.6	1,080
September.....	2,680	7	143	8,530
The year.....	3,790	5	91	66,000

• Estimated.

WAKARUSA RIVER NEAR LAWRENCE, KANS.

LOCATION.—Chain gage in NW¼ sec. 24, T. 13 S., R. 19 E., 4 miles southwest of Lawrence and 11 miles above junction with Kansas River.

DRAINAGE AREA.—458 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 2,920 second-feet May 18 (gage height, 16.56 feet); no flow at numerous times.

1929-33: Maximum, 10,500 second-feet Nov. 24, 1931 (gage height, 27.82 feet); no flow at numerous times. Bank-full stage, 22 feet.

REMARKS.—Records fair. Discharge estimated during periods of ice effect, Dec. 7-27, Feb. 7-18.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	1	2	6	2	0	23	24	49	1	0	4
2	4	1	2	6	2	1	8	22	40	0	0	4
3	4	0	2	6	2	0	6	19	27	0	3	4
4	3	0	2	5	3	1	5	17	25	0	2	3
5	2	1	2	4	2	1	5	34	18	0	1	2
6	1	1	2	4	2	1	4	40	13	0	0	2
7	0	1		4		2	4	46	9	0	0	3
8	0	1		3		2	3	40	8	0	1	3
9	0	2	1	3		2	3	19	5	1,350	0	3
10	3	2		4		1	3	24	5	201	0	3
11	4	1		4		1	3	26	6	13	1	2
12	4	1		4		1	2	870	6	11	1	2
13	3	2		4	1	1	2	1,290	150	5	0	83
14	3	2		2		1	3	592	20	4	0	55
15	3	2		4		1	3	98	7	2	0	49
16	3	2	2	4		1	2	72	4	2	0	72
17	3	2		4		1	2	55	2	1	1	10
18	3	2		4		0	2	2,170	2	1	0	7
19	3	2		4	1	0	52	318	2	0	0	8
20	2	2		2	1	0	1,140	131	1	0	6	11
21	3	2		4	1	0	2,240	1,750	1	0	611	5
22	3	1		4	1	0	2,130	190	1	0	263	4
23	3	2		4	1	0	213	225	1	0	18	3
24	2	2		4	0	1	122	225	0	0	15	2
25	1	1	5	3	0	5	86	946	0	0	6	2
26	1	2		2	1	6	62	1,200	0	0	12	2
27	0	2		2	1	3	43	180	0	0	14	2
28	1	2	10	2	1	1	37	290	5	0	37	1
29	1	1	14	2	0	1	32	201	6	0	14	2
30	1	2	9	1		106	25	114	4	0	8	2
31	1		8	1		140		52		0	5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	4	0	2.19	135
November	2	0	1.50	89
December	14		3.52	216
January	6	1	3.55	218
February	3	0	1.18	65
March	140	0	9.06	557
April	2,240	2	209	12,400
May	2,170	17	364	22,400
June	150	0	13.9	829
July	1,350	0	51.3	3,160
August	611	0	32.9	2,020
September	83	1	11.8	704
The year	2,240	0	59.1	42,800

STRANGER CREEK NEAR TONGANOXIE, KANS.

LOCATION.—Chain gage in NE¼ sec. 13, T. 11 S., R. 21 E., 1 mile above Tonganoxie Creek, 4 miles east of Tonganoxie, and 9 miles above junction with Kansas River.

DRAINAGE AREA.—406 square miles.

RECORDS AVAILABLE.—May 1929 to September 1933.

DISCHARGE.—Maximum during year, 2,540 second-feet May 18 (gage height, 21.48 feet); minimum, 1 second-foot during July, August, and September.

1929-33: Maximum, 10,600 second-feet June 2, 1929 (gage height, 26.46 feet); minimum, 1 second-foot Sept. 30, 1929, August 1930, and July, August, and September 1933. Bank-full stage, 23 feet.

Maximum stage known, 27.31 feet Apr. 21, 1929 (discharge, 15,300 second-feet).

REMARKS.—Records fair. Discharge estimated during period of ice effect, Dec. 7 to Jan. 15, Feb. 8-25.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	3	6		6	20	31	32	73	37	1	3
2	4	3	7		8	19	20	30	53	14	354	2
3	7	3	7		9	18	19	26	41	7	390	2
4	3	3	7		9	16	16	26	29	4	61	2
5	3	3	7		8	19	16	89	24	4	15	2
6	3	3	6		7	42	15	121	20	3	5	2
7	3	4			7	101	14	86	15	3	4	2
8	3	5		10		61	13	53	13	3	3	1
9	3	6				42	12	37	9	18	3	1
10	3	6				30	11	18	7	26	3	1
11	5	6				26	10	31	6	16	2	1
12	3	6				24	8	238	6	9	2	1
13	3	5				21	8	680	6	5	2	2
14	3	5			3	21	9	126	7	3	2	2
15	3	5	3			19	10	69	10	3	1	28
16	3	5		7		19	8	49	7	2	1	12
17	3	5		7		18	7	57	6	2	1	6
18	3	5		8		17	7	2,430	4	2	57	6
19	3	5		9		16	7	989	4	1	17	49
20	3	5		9		15	26	106	3	1	31	111
21	2	5		10		14	150	61	3	1	390	17
22	2	5		10	10	15	122	81	3	1	255	12
23	2	6		10		17	95	416	3	2	39	6
24	2	6		9		27	66	136	3	2	12	4
25	2	6		9		101	46	354	3	2	8	3
26	3	6		9	19	96	38	295	3	1	7	3
27	3	6	50		18	77	33	131	3	1	23	12
28	3	6		7	21	57	30	366	81	1	91	3
29	3	6		7		43	30	632	378	1	91	3
30	3	6		7		57	32	223	156	1	57	2
31	4			6		61		131		1	7	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7	2	3.10	190
November	6	3	4.97	296
December			17.4	1,070
January	10	6	9.10	559
February	21		7.43	413
March	101	14	36.4	2,240
April	150	7	30.3	1,800
May	2,430	18	262	16,100
June	378	3	32.6	1,940
July	37	1	5.71	351
August	390	1	62.4	3,840
September	111	1	10.0	597
The year	2,430	1	40.6	29,400

GRAND RIVER BASIN

GRAND RIVER NEAR GALLATIN, MO.

LOCATION.—Chain gage in NW¼ sec. 16, T. 59 N., R. 27 W., 1,070 feet above Chicago, Rock Island & Pacific Railway bridge and 2 miles north east of Gallatin. Zero of gage is 712.83 feet above mean sea level.

DRAINAGE AREA.—2,250 square miles.

RECORDS AVAILABLE.—June 1921 to September 1933.

DISCHARGE.—Maximum during year, 12,800 second-feet Aug. 22 (gage height, 23.96 feet); minimum, 21 second-feet July 27–30, Aug. 2, 3 (gage height, 1.78 feet).

1921–33: Maximum, 56,800 second-feet June 2, 1929 (gage height, 37.38 feet); minimum, 10 second-feet, while river was dammed upstream, May 15, 1924 (gage height, 1.55 feet). Average, 12 years, 1,190 second-feet.

Maximum stage known, 39.3 feet in July 1909.

REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 8–23, Feb. 4–19.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	40	94	420	182	160	1,860	108	152	72	24	262
2	49	40	91	336	206	144	764	144	115	49	21	214
3	47	39	101	298	198	130	792	152	94	43	21	182
4	49	39	130	262	214	130	514	137	80	29	490	167
5	47	37	144	246	182	115	376	137	67	28	490	137
6	45	39	137	230	152	115	336	182	62	24	190	137
7	45	40	137	230	122	144	376	356	55	23	81	122
8	43	51	137	230	94	246	420	246	47	46	61	108
9	43	280	108	230	80	280	336	214	40	785	4, 140	94
10	86	442	94	206	55	246	298	167	37	708	7, 550	84
11	108	376	80	206	55	214	246	160	36	490	1, 370	79
12	94	246	67	198	45	174	214	280	42	230	540	74
13	75	190	45	190	45	167	198	1, 260	36	130	490	81
14	55	174	37	174	45	160	182	952	33	80	190	74
15	51	246	30	190	45	160	174	398	31	55	160	174
16	43	540	30	182	45	152	167	246	31	45	122	122
17	42	624	30	167	45	144	160	198	30	43	152	87
18	40	376	30	198	55	130	144	167	28	38	144	71
19	40	246	30	182	94	137	137	152	28	31	79	70
20	39	246	30	246	167	144	137	122	28	30	66	74
21	36	160	30	230	246	137	137	1, 770	28	29	6, 040	61
22	37	108	30	230	280	137	152	2, 180	26	28	12, 400	48
23	40	94	30	280	376	144	174	1, 120	23	28	4, 270	46
24	39	86	144	490	280	144	144	298	26	24	919	44
25	39	88	5, 760	316	246	490	122	214	26	24	490	41
26	47	86	3, 200	262	214	736	122	540	25	24	356	1, 480
27	51	60	1, 370	230	190	652	115	336	24	21	280	11, 100
28	49	60	680	214	182	596	101	540	37	21	4, 270	9, 200
29	51	67	490	198	-----	420	94	736	356	21	2, 420	4, 070
30	42	88	420	160	-----	336	108	398	174	21	596	820
31	42	-----	514	167	-----	298	-----	214	-----	22	356	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	108	36	50.5	0.022	0.03	3, 110
November	624	37	174	.077	.09	10, 400
December	5, 760	30	462	.205	.24	28, 400
January	490	160	239	.106	.12	14, 700
February	376	45	148	.066	.07	8, 220
March	736	115	238	.106	.12	14, 600
April	1, 860	94	303	.135	.15	18, 000
May	2, 180	108	456	.203	.23	28, 000
June	356	23	60.6	.027	.03	3, 610
July	985	21	111	.049	.06	6, 820
August	12, 400	21	1, 570	.698	.80	96, 500
September	11, 100	41	977	.434	.48	58, 100
The year	12, 400	21	402	.179	2.42	290, 000

GRAND RIVER NEAR SUMNER, MO.

LOCATION.—Chain gage in NE¼ sec. 29, T. 56 N., R. 21 W., on county highway bridge 80 feet below Chicago, Burlington & Quincy Railroad bridge 2 miles southeast of Sumner. Zero of gage is 630.77 feet above mean sea level.

DRAINAGE AREA.—6,880 square miles.

RECORDS AVAILABLE.—April 1924 to September 1933.

DISCHARGE.—Maximum during year, 22,800 second-feet Dec. 2nd (gage height, 25.35 feet); minimum, 115 second-feet July 28, 30, 31 (gage height, 2.86 feet).

1924-33: Maximum, 110,000 second-feet June 4, 1929; maximum gage height, 35.35 feet Nov. 20, 1928; minimum, 105 second-feet Nov. 4-9, 1930; minimum gage height, 2.80 feet Dec. 2, 1924, Mar. 8, 1931.

Maximum stage known, 36.7 feet July 9, 1909 (discharge, about 150,000 second-feet).

REMARKS.—Records good except those for periods of ice effect, Dec. 11-23, Feb. 7-20, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	279	279	482	1,330	904	800	8,640	482	1,540	1,600	125	697
2	279	260	550	1,060	1,120	748	8,640	504	1,120	550	129	527
3	279	242	527	1,120	1,120	647	5,450	598	904	377	622	418
4	256	242	598	1,120	1,060	574	3,840	550	800	235	904	357
5	246	242	647	1,060	598	574	2,440	622	697	186	1,120	298
6	246	242	697	1,010	550	550	1,980	957	622	186	1,010	260
7	246	231	482	1,010	460	697	1,870	1,490	460	172	598	228
8	238	298	337	1,010	418	1,010	1,980	1,980	439	211	357	211
9	246	2,440	208	904	337	1,220	1,870	1,380	398	260	647	205
10	1,120	3,700	482	904	337	1,220	1,600	1,120	377	2,090	6,440	192
11	3,100	2,850	192	852	298	987	1,330	1,060	337	1,330	6,860	175
12	1,650	1,980	192	697	260	800	1,220	3,300	318	1,010	2,760	175
13	1,120	1,430	192	697	224	697	1,010	9,720	482	527	2,090	279
14	748	1,120	192	622	224	647	1,060	10,800	398	357	1,010	246
15	527	1,220	164	598	260	598	2,550	6,520	298	260	598	228
16	398	1,330	164	697	224	574	1,980	3,240	242	377	418	205
17	357	957	140	697	224	598	1,430	2,210	224	279	337	246
18	298	800	140	748	298	574	1,060	1,430	218	224	337	218
19	298	800	140	5,690	418	574	904	1,220	205	185	377	211
20	260	697	164	5,770	1,010	550	800	1,010	192	175	242	186
21	242	697	192	3,430	2,380	527	748	4,810	192	159	260	181
22	242	697	224	2,610	2,440	504	697	6,180	186	145	4,280	170
23	242	574	337	3,430	2,320	482	800	6,350	186	150	12,700	154
24	231	550	1,380	2,670	1,870	550	748	3,430	181	140	8,100	136
25	260	504	16,300	2,260	1,430	2,150	697	1,820	181	136	1,980	150
26	279	504	22,500	2,040	1,280	4,360	598	9,180	181	132	1,010	140
27	337	460	14,300	1,430	1,120	3,980	482	15,600	175	125	1,120	8,900
28	318	439	6,440	1,280	957	3,040	460	10,100	418	115	748	17,800
29	318	439	3,770	1,120	-----	2,320	460	9,080	2,610	121	4,730	14,700
30	318	504	2,440	852	-----	1,820	439	5,290	2,090	115	3,170	6,440
31	298	-----	2,040	800	-----	3,430	-----	2,210	-----	115	1,330	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	3,100	231	493	0.072	0.08	30,300
November	3,700	231	801	.130	.14	63,000
December	22,500	140	2,470	.359	.41	152,000
January	5,770	598	1,600	.233	.27	98,400
February	2,440	224	862	.125	.13	47,900
March	4,360	482	1,220	.177	.20	75,000
April	8,640	439	1,930	.281	.31	115,000
May	15,600	482	4,010	.583	.67	247,000
June	2,610	175	556	.081	.09	33,100
July	2,090	115	389	.057	.07	23,900
August	12,700	125	2,140	.311	.36	132,000
September	17,800	136	1,810	.263	.29	108,000
The year	22,500	115	1,540	.224	3.02	1,120,000

THOMPSON RIVER AT TRENTON, MO.

LOCATION.—Chain gage in SE¼ sec. 20, T. 61 N., R. 24 W., 1 mile south of Trenton.

DRAINAGE AREA.—1,680 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 13,500 second-feet Sept. 26 (gage height, 14.94 feet); minimum, 29 second-feet July 28.

1928-33: Maximum, 26,700 second-feet Nov. 18, 1928, Dec. 31, 1931; maximum gage height, 22.31 feet (former location) Nov. 18, 1928; minimum, 15 second-feet Nov. 6, 7, 1930; minimum gage height, 2.70 feet (former location) Oct. 7, 8, 1929.

Maximum stage known, 30.7 feet (former location) July 6, 1909, before new channel was dredged.

REMARKS.—Records fair except those for periods of ice effect, Dec. 9-23, Feb. 5-22, which are poor. Discharge interpolated Mar. 18.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	67	67	125	257	310	212	4,460	227	117	68	35	83
2.....	64	64	121	332	377	185	2,340	185	104	47	1,230	74
3.....	59	62	130	450	289	169	1,810	172	93	43	281	63
4.....	64	62	144	454	97	166	790	185	88	42	289	58
5.....	59	62	198	281	86	161	560	198	83	38	377	51
6.....	59	62	166	273	71	172	530	475	77	36	149	51
7.....	62	62	83	289	71	249	1,000	475	71	33	86	47
8.....	57	164	97	257	71	289	688	424	66	125	66	45
9.....	57	1,150	58	234	71	289	502	332	61	755	80	42
10.....	99	825	58	249	71	242	424	332	58	249	332	40
11.....	88	590	47	227	71	192	354	257	56	100	1,990	42
12.....	95	377	47	130	71	166	289	1,780	56	71	1,400	42
13.....	72	281	38	144	71	166	265	3,740	58	63	475	45
14.....	64	332	38	242	71	166	257	1,780	54	54	212	71
15.....	62	560	38	249	71	172	234	1,490	47	227	130	63
16.....	52	212	38	257	71	166	212	755	45	108	86	80
17.....	52	234	38	192	71	155	192	530	43	76	77	71
18.....	52	242	38	185	71	152	185	354	43	66	61	58
19.....	52	198	38	560	104	149	178	289	42	56	54	58
20.....	50	144	38	502	212	144	172	227	42	47	51	51
21.....	50	166	38	332	424	130	166	622	38	45	130	45
22.....	55	166	58	475	720	130	155	377	40	43	1,310	42
23.....	62	130	125	825	424	155	144	265	40	42	1,000	38
24.....	62	139	3,440	560	332	149	139	249	40	38	265	45
25.....	72	117	5,350	790	310	289	135	178	42	35	149	43
26.....	84	78	4,020	560	310	688	130	3,440	40	35	655	4,020
27.....	95	68	1,230	424	273	688	130	530	40	33	178	6,590
28.....	95	100	930	354	227	655	125	377	66	29	1,070	3,300
29.....	91	108	688	198	-----	530	125	810	77	30	354	1,000
30.....	78	104	530	242	-----	424	125	192	58	32	144	424
31.....	72	-----	377	273	-----	1,490	-----	139	-----	35	97	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	99	50	67.8	0.040	0.05	4,170
November.....	1,150	62	231	.138	.15	13,700
December.....	5,350	38	592	.352	.41	36,400
January.....	825	130	345	.205	.24	21,200
February.....	720	71	194	.115	.12	10,800
March.....	1,490	130	293	.174	.20	18,000
April.....	4,460	125	544	.324	.36	32,400
May.....	3,740	139	674	.401	.46	41,400
June.....	117	38	59.5	.035	.04	3,540
July.....	755	29	87.1	.052	.06	5,360
August.....	1,990	35	413	.246	.28	25,400
September.....	6,590	38	556	.331	.37	33,100
The year.....	6,590	29	339	.202	2.74	245,000

WELDON RIVER AT MILL GROVE, MO.

LOCATION.—Chain gage in SE¼SE¼ sec. 28, T. 65 N., R. 24 W., at county highway bridge in Mill Grove.

DRAINAGE AREA.—494 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 5,400 second-feet Sept. 27 (gage height, 17.08 feet); minimum, 2 second-feet Dec. 9–21; minimum gage height, 1.33 feet Sept. 11, 12, 22, 24.

1929–33: Maximum, 14,200 second-feet June 2, 1929 (gage height, 20.6 feet); minimum, 1.6 second-feet Sept. 21–24, Oct. 4–6, 1930, Sept. 14, 1931; minimum gage height, 1.16 feet Sept. 14, 1931.

Maximum stage known, about 23.5 feet in July 1909.

REMARKS.—Records fair except those for periods of ice effect, Nov. 18, 19, 25–27, Dec. 9–21, 31, Jan. 1, 12–14, Feb. 4–21, which are poor. Discharge estimated for Jan. 7, Apr. 5, Sept. 30.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	4.4	28	12	142	92	50	780	71	20	12	309	5
2.....	4.4	24	12	192	115	48	343	56	19	11	156	4.4
3.....	4.1	26	13	244	86	45	170	41	18	10	309	4.1
4.....	5	24	20	259	51	40	122	38	17	9	36	3.8
5.....	6	24	34	275	21	38	130	36	15	9	15	3.5
6.....	6	26	22	275	21	40	149	192	16	8	11	3.8
7.....	5	26	13	245	10	170	177	122	16	8	9	3.5
8.....	4.7	125	4.1	214	5	109	122	86	15	170	8	3.2
9.....	5	700	2.0	70	5	98	98	81	14	65	11	3.2
10.....	9	340	2.0	58	5	52	86	60	14	33	13	3.2
11.....	42	97	2.0	70	5	46	70	103	13	2	103	2.9
12.....	22	125	2.0	71	5	45	64	840	20	15	44	2.9
13.....	9	63	2.0	71	5	52	66	1,470	19	12	22	4.7
14.....	7	125	2.0	42	5	46	62	259	13	10	14	12
15.....	6	118	2.0	40	5	54	58	122	11	8	11	22
16.....	6	104	2.0	45	5	45	54	81	12	7	9	17
17.....	7	50	2.0	66	5	43	50	65	11	6	7	6
18.....	7	40	2.0	68	5	43	48	53	11	6	6	4.7
19.....	11	40	2.0	98	5	45	46	46	10	7	4	4.7
20.....	11	38	2.0	122	42	48	43	39	10	6	5	2.9
21.....	10	36	2.0	122	61	43	45	65	10	6	68	2.9
22.....	13	42	3.2	149	98	36	41	49	9	6	71	2.6
23.....	13	36	20	229	326	35	36	128	10	6	22	2.9
24.....	17	24	1,220	142	70	41	33	51	10	5	11	2.6
25.....	32	13	3,890	115	66	52	33	31	10	4.7	23	2.9
26.....	38	13	740	103	64	109	32	103	12	6	15	942
27.....	67	10	540	98	54	122	30	47	13	5	16	4,970
28.....	38	11	214	81	50	109	29	42	20	4.7	92	600
29.....	34	10	199	76	-----	70	29	28	22	5	22	149
30.....	32	10	122	92	-----	70	30	25	21	5	10	90
31.....	30	-----	115	86	-----	1,860	-----	22	-----	4.4	8	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	57	4.1	16.0	0.032	0.04	984
November.....	700	10	78.3	.159	.18	4,660
December.....	3,890	2.0	233	.472	.54	14,300
January.....	275	40	128	.259	.30	7,870
February.....	326	5	46	.093	.10	2,550
March.....	1,860	35	119	.241	.28	7,320
April.....	780	29	103	.209	.23	6,130
May.....	1,470	22	144	.291	.34	8,850
June.....	22	9	14.4	.029	.03	867
July.....	170	4.4	15.8	.032	.04	972
August.....	309	4.4	47.1	.095	.11	2,900
September.....	4,970	2.6	229	.464	.52	13,600
The year.....	4,970	2.0	98.1	.199	2.71	71,000

MEDICINE CREEK NEAR GALT, MO.

LOCATION.—Chain gage in NW¼ sec. 34, T. 62 N., R. 22 W., at Quincy, Omaha & Kansas City Railroad bridge 1 mile above West Medicine Creek and 1½ miles east of Galt.

DRAINAGE AREA.—225 square miles.

RECORDS AVAILABLE.—July 1921 to September 1933.

DISCHARGE.—Maximum during year, 1,660 second-feet May 13 (gage height, 7.32 feet), minimum, 1.7 second-feet July 26, 28, Sept. 18; minimum gage height, 2.88 feet Sept. 18.

1921-33: Maximum, 7,760 second-feet Aug. 2, 1932; maximum gage height, 1,560 feet Apr. 20, 1929; minimum, less than 1 second-foot Aug. 22, 29, 1922. Average, 10 years (1921-24, 1925-28, 1929-33), 144 second-feet.

REMARKS.—Records fair except those for periods of ice effect, Nov. 16-18, 20, 22, 23, 27, Dec. 8-22, Jan. 12-15, Feb. 3-21, and those estimated for Nov. 5, 26, Dec. 31, June 30, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7	9	22	103	65	33	1,250	16	36	10	3.1	3.1
2	7	6	22	100	65	33	312	18	30	8	2.6	3.1
3	6	8	28	68	54	26	160	22	25	4.7	38	2.6
4	11	22	28	48	40	26	112	14	20	3.9	8	2.6
5	6	11	30	40	18	26	94	33	18	3.9	6	2.2
6	6	9	48	24	9	38	109	91	14	3.9	4.7	2.2
7	6	8	6	18	4	62	109	143	13	3.9	6	2.2
8	13	120	4	22	2	71	85	60	13	9	4.7	2.2
9	20	160	4	22	2	62	71	38	10	27	23	2.2
10	88	216	2	28	2	74	57	51	8	8	10	2.2
11	82	88	2	35	2	33	46	65	8	5	6	1.8
12	79	54	2	40	2	30	43	550	13	4.3	3.1	1.8
13	51	38	2	40	2	33	35	1,660	7	3.7	3.1	3.1
14	28	40	2	28	2	35	46	374	6	2.8	3.1	3.5
15	22	38	2	28	2	30	46	120	6	2.8	3.1	2.6
16	13	40	2	24	2	33	43	76	4.7	2.0	2.6	2.2
17	11	28	2	18	2	26	38	55	6	2.0	2.2	1.8
18	11	18	2	30	2	30	35	47	4.7	2.8	2.2	1.7
19	8	11	2	187	9	26	30	30	3.9	3.3	2.6	3.5
20	8	18	4	127	82	16	30	30	3.9	2.4	2.6	2.2
21	6	11	9	112	127	79	28	55	3.1	2.4	9	2.2
22	8	18	54	152	143	30	24	1,260	3.5	2.4	6	1.8
23	8	18	143	196	74	18	22	755	3.1	2.4	3.1	2.2
24	8	9	1,010	135	57	16	18	112	3.9	2.4	3.1	2.6
25	13	13	630	94	62	65	16	60	6	2.0	2.6	2.6
26	20	13	415	76	51	143	14	930	3.9	1.7	2.2	3.1
27	20	28	97	68	46	135	14	324	6	2.0	2.2	1,260
28	22	9	143	57	38	100	14	361	12	1.7	6	902
29	16	9	91	43	-----	68	16	109	41	1.8	3.9	157
30	16	18	82	43	-----	71	16	62	20	1.8	3.5	36
31	16	-----	85	54	-----	1,010	-----	43	-----	2.6	3.1	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	88	6	20.5	0.091	0.10	1,260
November	216	6	36.3	.161	.18	2,160
December	1,010	2.0	96.0	.427	.49	5,900
January	196	18	66.5	.296	.34	4,090
February	143	2.0	34.5	.153	.16	1,920
March	1,010	16	79.9	.355	.41	4,910
April	1,250	14	97.8	.435	.49	5,820
May	1,660	14	244	1.08	1.24	15,000
June	41	3.1	11.8	.052	.06	702
July	27	1.7	4.41	.020	.02	271
August	38	2.2	5.85	.026	.03	360
September	1,260	1.7	80.6	.358	.40	4,800
The year	1,660	1.7	65.1	.289	3.92	47,200

MEDICINE CREEK NEAR STURGES, MO.

LOCATION.—Chain gage on line between sec. 35, T. 59 N., R. 23 W., and sec. 2, T. 58 N., R. 23 W., 3 miles east of Sturges. Zero of gage is 691.60 feet above mean sea level.

DRAINAGE AREA.—368 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 3,660 second-feet Dec. 24 (gage height, 9.04 feet); minimum, 3.2 second-feet Aug. 20; minimum gage height, 3.64 feet Sept. 9, 10, 23.

1929-33: Maximum, 10,400 second-feet Apr. 21, 1929 (gage height, 15.74 feet); minimum, 2.5 second-feet Jan. 9-20, 1931; minimum gage height, 3.08 feet Sept. 14, 1931.

REMARKS.—Records fair except those during periods of ice effect, Nov. 18-26, 28, Dec. 8-23, Jan. 13-15, Feb. 6-21, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	14	21	45	105	70	54	2,200	32	95	44	6	5
2-----	16	19	45	201	101	51	955	30	65	30	21	6
3-----	14	19	51	97	74	48	312	32	62	18	253	5
4-----	16	16	51	51	60	45	201	32	56	18	48	5
5-----	16	16	54	34	39	42	166	38	46	18	19	5
6-----	16	16	60	31	39	54	166	108	35	18	11	5
7-----	16	21	64	85	14	118	166	142	35	10	6	4.6
8-----	16	89	54	51	6	166	142	120	30	30	6	4.6
9-----	24	359	26	42	6	113	107	68	27	56	21	4.6
10-----	410	450	14	42	6	74	95	59	27	56	31	4.6
11-----	177	214	14	51	6	54	87	328	25	30	14	5
12-----	145	109	6	34	6	57	76	640	25	20	9	54
13-----	105	101	6	39	6	51	65	2,380	25	14	6	14
14-----	67	89	6	39	6	48	76	1,040	20	8	4.6	16
15-----	48	85	6	39	6	56	108	312	18	8	4.6	16
16-----	29	78	6	42	6	52	76	166	20	11	4.6	12
17-----	29	78	6	45	6	44	68	124	15	8	4.6	8
18-----	19	70	6	39	6	44	56	99	20	11	4.6	6
19-----	16	54	6	640	26	44	56	80	18	8	3.9	14
20-----	16	54	6	375	109	46	44	68	18	8	3.2	11
21-----	16	39	14	189	226	40	50	138	18	8	9	9
22-----	16	39	39	375	253	52	44	1,090	18	8	19	8
23-----	21	39	89	343	177	44	40	2,290	15	8	11	6
24-----	19	39	2,000	240	122	38	35	328	18	8	5	9
25-----	24	39	2,200	154	101	111	35	142	15	8	6	9
26-----	36	39	1,840	118	93	392	32	2,290	20	8	4.6	12
27-----	36	36	312	103	78	268	32	1,140	18	5	4.6	1,180
28-----	34	39	189	67	60	189	30	472	32	3.9	12	2,200
29-----	31	45	166	64	-----	124	27	495	40	5	14	545
30-----	29	51	140	60	-----	111	25	177	91	5	8	118
31-----	29	-----	109	67	-----	1,140	-----	116	-----	3.9	6	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October-----	410	14	48.4	0.132	0.15	2,980
November-----	450	16	78.8	.214	.24	4,690
December-----	2,200	6	236	.641	.74	14,500
January-----	640	31	125	.340	.39	7,690
February-----	253	6	61.0	.166	.17	3,390
March-----	1,140	38	122	.332	.38	7,500
April-----	2,200	25	186	.505	.56	11,100
May-----	2,380	30	470	1.28	1.48	28,900
June-----	95	15	32.2	.088	.10	1,920
July-----	59	3.9	16.1	.044	.05	990
August-----	253	3.2	18.7	.051	.06	1,150
September-----	2,200	4.6	143	.389	.43	8,510
The year-----	2,380	3.2	129	.351	4.75	93,300

LOCUST CREEK NEAR MILAN, MO.

LOCATION.—Chain gage in SW¼ sec. 8 T. 62 N., R. 20 W., at bridge on State highway 6, 3½ miles southwest of Milan.

DRAINAGE AREA.—225 square miles.

RECORDS AVAILABLE.—July 1921 to September 1933 (discontinued).

DISCHARGE.—Maximum during year, 2,260 second-feet Dec. 26 (gage height, 14.87 feet); minimum, 0.4 second-feet July 31 (gage height, 2.58 feet).

1921-33: Maximum, 3,880 second-feet Nov. 18, 1928 (gage height, 20.07 feet); minimum, 0.1 second-foot Aug. 8, 1930. Average, 12 years (1921-33), 152 second-feet.

REMARKS.—Records fair except those for periods of ice effect, Nov. 15-17, 22, Dec. 7-21, Jan. 6-12, Feb. 5-19, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	6	11	15	55	55	28	1,140	20	21	19	1.2	2.1
2.....	6	10	18	60	61	27	463	19	18	10	232	2.1
3.....	7	9	20	45	45	27	127	18	16	6	47	1.6
4.....	8	10	21	42	24	25	87	17	14	6	8	1.4
5.....	8	9	22	34	14	24	67	36	13	3.5	4.8	1.1
6.....	7	9	22	32	8	32	76	174	12	3.2	3.5	1.2
7.....	6	10	13	32	6	50	80	122	10	2.9	3.2	1.2
8.....	7	134	6	32	6	52	64	42	9	6	2.9	1.2
9.....	284	256	3.8	28	6	40	50	32	8	8	10	1.0
10.....	196	196	2.3	28	6	27	40	45	7	6	4.8	1.1
11.....	114	87	2.3	28	6	22	32	61	7	3.2	4.5	1.4
12.....	105	42	2.3	28	6	25	30	680	6	2.6	3.5	1.6
13.....	35	31	2.3	27	6	28	30	1,240	6	2.1	2.3	1.9
14.....	23	21	2.3	28	6	30	42	447	5	2.1	2.1	1.6
15.....	20	21	2.3	28	6	27	38	142	5	1.8	2.1	1.9
16.....	16	17	2.3	32	6	24	32	55	5	1.4	1.9	1.9
17.....	13	17	2.3	38	6	23	30	40	4.7	1.2	1.9	1.4
18.....	11	19	2.3	45	11	25	27	34	4.7	1.4	1.9	1.4
19.....	11	19	2.3	341	24	27	26	30	4.4	1.2	1.4	1.1
20.....	9	15	2.3	233	80	26	25	26	4.4	1.2	2.6	1.1
21.....	8	9	3.8	122	73	24	24	108	4.4	1.1	42	.7
22.....	8	10	6	272	73	19	22	50	4.4	.8	4.8	.6
23.....	8	14	64	341	84	19	21	58	4.7	1	3.5	.6
24.....	8	12	1,190	163	58	26	20	48	4.4	.8	2.6	1.0
25.....	11	11	1,970	95	48	112	20	26	5	.8	2.3	1.1
26.....	21	11	1,750	73	42	209	19	371	6	.8	1.9	2.1
27.....	24	7	259	64	34	142	19	197	5	.7	2.1	557
28.....	24	7	185	50	30	80	17	259	11	.8	4.8	1,070
29.....	20	13	142	38	-----	48	18	70	808	.5	3.2	200
30.....	16	11	103	40	-----	64	19	34	530	.5	2.1	18
31.....	13	-----	58	45	-----	620	-----	25	-----	.4	2.3	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	284	6	34.0	0.151	0.17	2,090
November.....	256	7	34.9	.155	.17	2,080
December.....	1,970	2.3	190	.844	.97	11,700
January.....	341	27	80.9	.360	.42	4,970
February.....	84	6	29.6	.132	.14	1,640
March.....	620	19	63.0	.280	.32	3,870
April.....	1,140	17	90.2	.401	.45	5,370
May.....	1,240	17	146	.649	.75	8,980
June.....	808	4.4	52.1	.232	.26	3,100
July.....	19	.4	3.12	.014	.02	192
August.....	232	1.2	13.3	.059	.07	818
September.....	1,070	.6	62.7	.279	.31	3,730
The year.....	1,970	0.4	67.1	.298	4.05	48,500

LOCUST CREEK NEAR LINNEUS, MO.

LOCATION.—Chain gage in NE¼ sec. 34, T. 59 N., R. 21 W., on county highway bridge 3 miles northwest of Linneus.

DRAINAGE AREA.—550 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 4,390 second-feet Dec. 24 (gage height, 11.14 feet); minimum, 3.8 second-feet Sept. 9 (gage height, 2.57 feet).

1929-33: Maximum, 14,100 second-feet Apr. 21, 1929 (gage height, 20.89 feet); minimum, 3.6 second-feet Oct. 2, 1930; minimum gage height, 2.56 feet Sept. 13, 16, 1931.

REMARKS.—Records fair except those for periods of ice effect, Nov. 17-21, 27, 28, Dec. 7-23, Jan. 11-13, Feb. 4-20, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	29	43	263	189	90	822	57	57	237	9	9
2	19	25	48	212	178	71	1,340	52	52	69	11	16
3	19	23	54	178	158	76	379	51	48	51	572	10
4	23	23	66	131	95	74	304	38	48	29	106	7
5	20	23	65	131	48	77	200	122	45	23	63	6
6	19	22	62	122	25	122	200	290	34	18	31	6
7	17	21	35	122	17	189	189	319	33	15	17	5
8	18	178	17	113	17	158	178	189	23	23	13	4.0
9	82	538	7	113	17	149	158	106	23	20	21	3.8
10	1,820	379	7	113	17	108	131	102	20	16	45	4.0
11	980	349	7	113	17	87	95	1,200	19	17	21	9
12	224	189	7	113	17	81	87	2,100	19	19	15	11
13	131	85	7	113	17	82	79	2,610	17	17	9	9
14	122	76	7	113	17	81	187	1,690	15	15	9	9
15	85	82	7	113	17	84	676	505	13	13	7	9
16	60	95	7	106	17	73	441	189	13	12	7	7
17	48	95	7	95	17	74	131	168	11	11	9	6
18	43	113	7	100	25	189	122	131	12	11	6	5
19	35	113	7	2,100	63	131	113	131	13	10	7	7
20	33	113	7	1,340	168	102	99	102	12	9	10	6
21	29	95	7	473	572	89	89	149	12	9	319	4.6
22	27	82	17	1,240	822	82	84	473	12	9	178	6
23	32	48	79	860	276	74	76	263	11	9	47	6
24	33	38	4,390	473	200	77	73	158	13	8	23	5
25	63	33	3,100	379	178	860	69	122	12	7	12	4.0
26	82	40	1,820	263	168	640	63	149	13	9	9	4.6
27	73	48	473	189	140	572	60	1,020	12	9	24	13
28	60	48	410	178	97	410	54	505	109	8	28	541
29	51	30	330	168	-----	224	52	748	189	7	30	1,060
30	40	40	250	149	-----	263	60	237	822	7	18	102
31	36	-----	290	158	-----	748	-----	113	-----	13	9	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,820	17	140	0.255	0.29	8,610
November	538	21	102	.185	.21	6,070
December	4,390	7	375	.682	.79	23,100
January	2,100	95	333	.605	.70	20,500
February	822	17	128	.233	.24	7,110
March	860	71	198	.360	.42	12,200
April	1,340	52	220	.400	.45	13,100
May	2,610	38	454	.825	.95	27,900
June	822	11	57.7	.105	.12	3,430
July	237	7	23.5	.043	.05	1,440
August	572	6	54.4	.099	.11	3,340
September	1,060	3.8	63.2	.115	.13	3,760
The year	4,390	3.8	180	.327	4.46	131,000

CHARITON RIVER BASIN

CHARITON RIVER AT NOVINGER, MO.

LOCATION.—Chain gage in W $\frac{1}{2}$ sec. 27, T. 63 N., R. 16 W., at bridge on State Highway 6, three-quarters of a mile east of Novinger. Zero of gage is about 738.2 feet above mean sea level.

DRAINAGE AREA.—1,370 square miles.

RECORDS AVAILABLE.—January 1931 to September 1933.

DISCHARGE.—Maximum during year, 6,500 second-feet Dec. 25 (gage height, 22.02 feet); minimum, 11 second-feet July 30 (gage height, 2.48 feet).

1931-33: Maximum, 15,400 second-feet Nov. 25, 1931 (gage height, 26.03 feet); minimum, 10 second-feet Jan. 16-22, 1931; minimum gage height, 1.84 feet Jan. 19, 1931.

Maximum stage known, 28.6 feet in June 1917.

REMARKS.—Records fair except those for periods of ice effect, Dec. 8-24, Jan. 13, 14, Feb. 5-20, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	37	56	74	609	362	200	4,140	134	186	134	23	31
2.....	31	52	70	531	378	186	4,100	147	140	128	394	43
3.....	37	46	81	410	332	173	3,590	134	116	70	257	26
4.....	37	46	97	394	302	180	3,070	134	97	52	37	49
5.....	36	43	97	332	186	154	1,820	394	89	43	26	40
6.....	46	37	97	287	93	154	1,080	1,740	77	40	23	37
7.....	49	40	101	317	70	200	960	1,310	66	36	24	40
8.....	46	1,310	56	257	56	242	835	1,110	60	46	24	30
9.....	63	960	15	287	49	214	694	762	56	43	77	24
10.....	1,520	885	15	272	49	186	569	694	46	40	63	23
11.....	549	672	18	257	49	166	477	2,190	40	33	106	17
12.....	394	549	18	257	56	160	426	3,660	40	28	121	22
13.....	272	362	18	257	49	160	362	4,280	30	24	77	19
14.....	214	257	18	257	49	154	495	3,470	30	24	66	20
15.....	140	200	18	287	56	147	1,080	2,710	30	20	43	16
16.....	89	186	15	214	63	134	460	1,600	30	22	29	18
17.....	74	147	15	200	70	134	378	885	25	17	166	28
18.....	63	173	15	228	85	443	347	672	24	19	37	24
19.....	56	128	18	3,340	134	317	317	589	23	19	23	23
20.....	49	121	18	1,240	302	257	272	394	22	17	56	14
21.....	37	134	26	716	410	186	242	935	22	16	186	16
22.....	43	116	134	1,210	443	154	228	460	22	17	147	17
23.....	43	101	2,160	1,210	589	160	200	531	21	20	49	14
24.....	43	121	4,180	1,160	426	147	186	716	20	56	56	17
25.....	63	81	6,200	835	394	302	186	477	19	24	46	17
26.....	121	106	3,780	650	317	1,470	173	332	24	16	35	17
27.....	106	106	2,040	531	272	910	160	549	20	14	27	1,930
28.....	85	89	1,930	426	242	549	140	513	28	14	186	3,190
29.....	85	81	1,850	362	-----	495	134	410	4,710	14	60	3,040
30.....	93	77	1,570	347	-----	1,360	147	460	1,180	11	52	2,300
31.....	77	-----	960	302	-----	2,450	-----	257	-----	14	37	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	1,520	31	148	0.108	0.12	9,100
November.....	1,310	37	243	.177	.20	14,500
December.....	6,200	15	829	.605	.70	51,000
January.....	3,340	200	580	.423	.49	35,700
February.....	589	49	210	.153	.16	11,700
March.....	2,450	134	391	.285	.33	24,000
April.....	4,140	134	909	.664	.74	54,100
May.....	4,280	134	1,050	.766	.88	64,600
June.....	4,710	19	243	.177	.20	14,500
July.....	134	11	34.5	.025	.03	2,120
August.....	394	23	82.4	.060	.07	5,070
September.....	3,190	14	370	.270	.30	22,000
The year.....	6,200	11	426	.311	4.22	308,000

CHARITON RIVER NEAR KEYTESVILLE, MO.

LOCATION.—Chain gage in SE¼ sec. 25, T. 54 N., R. 18 W., 4½ miles northeast of Keytesville.

DRAINAGE AREA.—1,950 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 12,500 second-feet Dec. 25 (gage height, 20.64 feet); minimum, 35 second-feet Sept. 26 (gage height, 3.50 feet).

1929-33: 18,700 second-feet Apr. 25, 1929 (gage height, 21.66 feet); minimum, 11 second-feet Nov. 10, 13, 1930; minimum gage height, 1.76 feet Oct. 5, Nov. 3, 1930.

Maximum stage known, 22.54 feet Nov. 18, 1928.

REMARKS.—Records fair. Stage-discharge relation affected by ice Nov. 17, 18, Dec. 10-23, Jan. 2, 3, Feb. 6-19.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	132	160	150	1,320	479	375	4,300	222	612	4,440	38	102
2.....	124	160	150	1,150	479	350	4,700	254	457	1,640	37	'92
3.....	115	141	150	948	558	325	4,760	232	350	585	232	86
4.....	115	132	160	808	479	289	4,000	222	289	350	1,300	74
5.....	112	124	170	612	401	277	3,260	668	243	232	375	84
6.....	105	115	200	558	375	277	2,640	1,320	222	180	150	69
7.....	107	115	190	505	301	427	1,640	2,000	200	150	109	68
8.....	107	427	190	479	254	558	1,210	1,670	170	124	87	69
9.....	109	1,770	105	427	170	505	1,120	1,270	141	132	105	68
10.....	170	1,640	84	401	132	427	976	1,000	132	124	301	58
11.....	2,690	1,000	70	375	115	350	808	2,000	115	132	505	54
12.....	1,380	752	58	375	99	325	696	4,630	110	112	200	54
13.....	724	724	58	325	115	301	585	11,000	115	96	115	53
14.....	505	585	58	289	115	301	1,000	8,760	96	84	160	52
15.....	401	453	58	277	115	277	1,670	6,520	80	76	124	51
16.....	325	375	58	301	115	254	2,110	4,700	81	65	109	48
17.....	254	350	58	301	150	243	1,150	2,740	69	59	93	46
18.....	211	350	58	325	150	232	808	1,640	65	57	70	41
19.....	180	350	58	5,610	232	350	640	1,060	63	51	81	46
20.....	160	289	58	4,960	976	505	558	1,000	58	50	90	44
21.....	150	243	58	2,460	920	531	479	2,410	50	53	76	40
22.....	132	190	84	1,540	836	375	453	2,500	50	48	892	36
23.....	132	200	277	1,600	780	325	401	1,180	62	43	780	38
24.....	124	180	5,820	1,440	892	301	350	1,410	47	44	301	40
25.....	124	180	12,500	1,380	696	892	325	1,240	44	42	180	36
26.....	141	170	10,500	1,120	585	3,040	301	3,700	42	132	141	35
27.....	243	150	6,800	920	505	2,690	289	2,890	41	70	124	39
28.....	243	150	4,760	752	453	1,570	266	1,510	50	47	112	40
29.....	211	124	2,090	640	-----	1,030	243	1,180	5,960	41	98	2,550
30.....	170	132	2,150	558	-----	836	232	1,030	7,540	42	243	2,840
31.....	160	-----	1,920	505	-----	5,150	-----	724	-----	41	150	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	2,690	105	318	0.163	0.19	19,600
November.....	1,770	115	391	.200	.22	23,300
December.....	12,500	58	1,610	.836	.95	99,000
January.....	5,610	277	1,070	.549	.63	65,800
February.....	976	99	410	.200	.22	22,800
March.....	5,150	232	764	.392	.45	47,000
April.....	4,760	232	1,400	.708	.80	83,300
May.....	11,000	222	2,340	1.20	1.38	144,000
June.....	7,540	41	585	.300	.33	34,800
July.....	4,440	41	301	.154	.18	18,500
August.....	1,300	37	238	.122	.14	14,600
September.....	2,840	35	232	.119	.13	13,800
The year.....	12,500	35	811	.416	5.62	586,000

LAMINE RIVER BASIN

LAMINE RIVER AT CLIFTON CITY, MO.

LOCATION.—Chain gage in NW¼ sec. 16, T. 46 N., R. 19 W., on county highway bridge 300 feet above Missouri-Kansas-Texas Railroad bridge and three-quarters of a mile east of Clifton City. Zero of gage is 622.60 feet above mean sea level.

DRAINAGE AREA.—598 square miles.

RECORDS AVAILABLE.—June 1922 to September 1933.

DISCHARGE.—Maximum during year, 17,800 second-feet Dec. 25 (gage height, 26.10 feet); minimum, 2.8 second-feet July 25 (gage height, 1.26 feet).

1922-33: Maximum, 33,000 second-feet May 19, 1929 (gage height, 29.0 feet); minimum, 0.9 second-foot Sept. 5, 1930 (gage height, 1.22 feet). Average, 11 years (1922-33), 455 second-feet.

Maximum stage known, 35.3 feet Sept. 18, 1905.

REMARKS.—Records good except those for periods of ice effect, Dec. 9-22, Feb. 8-18, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	32	23	18	187	187	238	760	123	184	11	4.4	3.6
2.....	20	20	17	151	206	194	475	108	142	11	4.4	3.8
3.....	15	17	17	140	169	163	320	94	116	10	151	4.0
4.....	12	16	17	134	140	134	254	81	92	11	118	4.8
5.....	10	15	17	123	113	118	337	615	79	10	45	4.8
6.....	8	15	16	113	108	145	1,200	800	71	8	23	3.8
7.....	8	16	16	108	94	2,330	650	354	60	8	29	3.6
8.....	7	17	15	90	73	2,470	388	238	50	7	22	7
9.....	7	16	13	86	73	650	304	163	44	7	16	7
10.....	11	22	13	81	73	405	222	118	41	8	13	7
11.....	10	39	13	73	55	304	175	3,190	35	7	10	6
12.....	8	39	13	66	55	271	140	5,240	111	7	8	5
13.....	8	34	13	62	55	238	118	8,100	64	7	8	545
14.....	13	27	13	59	55	206	129	7,780	41	6	17	99
15.....	13	27	13	55	55	163	163	1,400	38	6	12	49
16.....	11	23	13	52	55	123	254	880	31	6	8	134
17.....	11	22	9	49	73	108	650	545	26	5	7	62
18.....	9	20	9	62	175	108	440	405	22	4.8	8	34
19.....	8	20	9	3,460	175	104	304	304	20	4.8	7	22
20.....	7	18	9	1,400	163	99	238	238	18	4.4	6	15
21.....	6	18	9	615	157	90	206	371	17	4.0	7	11
22.....	6	18	9	6,840	123	86	545	304	16	3	5	8
23.....	7	18	3,100	3,140	99	77	475	222	14	3.4	4.0	4,190
24.....	7	22	11,500	685	86	77	337	354	13	3.2	4.0	1,980
25.....	11	25	16,400	685	4,690	194	254	545	12	2.8	4.0	254
26.....	69	23	2,960	510	1,120	440	200	1,200	16	3.4	3.8	172
27.....	145	23	720	405	475	238	157	880	32	9	3.8	545
28.....	104	20	510	288	320	169	129	510	17	7	3.8	422
29.....	66	20	371	238	-----	145	118	405	14	6	3.8	172
30.....	42	18	304	206	-----	800	118	405	12	5	3.6	96
31.....	32	-----	254	194	-----	840	-----	254	-----	4.8	3.6	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	145	6	23.3	0.039	0.04	1,430
November.....	39	15	21.7	.036	.04	1,290
December.....	16,400	9	1,170	1.96	2.26	71,900
January.....	6,840	49	657	1.10	1.27	40,400
February.....	4,690	55	329	.550	.57	18,300
March.....	2,330	77	394	.659	.76	24,200
April.....	1,200	118	335	.560	.62	19,900
May.....	8,100	81	1,170	1.96	2.26	71,900
June.....	184	12	48.3	.081	.09	2,870
July.....	11	2.8	6.48	.011	.01	398
August.....	151	3.6	18.2	.030	.03	1,120
September.....	4,190	3.6	296	.495	.55	17,600
The year.....	16,400	2.8	375	.627	8.50	271,000

BLACKWATER RIVER AT BLUE LICK, MO.

LOCATION.—Chain gage on line between secs. 27 and 34, T. 49 N., R. 21 W., three-quarters of a mile below Finney Creek and 1 mile south of Blue Lick.

DRAINAGE AREA.—1,120 square miles.

RECORDS AVAILABLE.—June 1922 to September 1933 (discontinued).

DISCHARGE.—1922-33: Maximum, 40,000 second-feet Nov. 18, 1928 (gage height, 41.25 feet); minimum, 0.5 second-foot Nov. 13, 1928, Aug. 3, 1931; minimum gage height, 0.96 foot July 6, 1926. Average, 11 years, 674 second-feet.

REMARKS.—Records fair except those estimated and those for periods of ice effect, Jan. 7 to Feb. 23, Nov. 30, Dec. 1-11, 19-23, 29-31, 1929; Jan. 1 to Feb. 6, Dec. 17-31, 1930; Jan. 1-23, 1931; Dec. 9-21, 1932; Feb. 9-18 1933, which are poor.

Discharge, in second-feet, 1928-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1-----	3	3	251	* 186	272	4,220	9,500	400	4,350	92	20	2
2-----	3	12	185	175	207	3,340	15,800	2,430	6,730	86	16	2
3-----	4	95	175	155	175	1,290	12,200	4,350	11,300	80	12	2
4-----	4	145	165	95	145	662	3,870	996	15,400	65	16	2
5-----	3	47	145	1,160	125	842	667	1,010	15,800	62	7	23
6-----	3	35	110	2,070	95	1,040	302	892	9,920	55	5	86
7-----	2	20	105	2,940	85	968	274	859	2,260	1,270	5	75
8-----	2	8	100	2,040	75	608	1,160	605	747	1,070	2	49
9-----	2	2.2	85	1,010	75	490	5,860	400	372	414	30	22
10-----	1	.7	85	2,320	75	378	11,000	246	302	811	442	14
11-----	1	* .7	105	2,940	75	306	13,600	180	206	943	120	8
12-----	1	.7	105	3,700	75	442	12,000	4,650	156	3,000	54	7
13-----	3	.5	572	2,040	75	1,060	4,150	11,000	2,920	699	31	4
14-----	1	1.	1,100	1,550	95	1,160	560	17,400	5,170	260	33	2
15-----	.6	.6	734	752	125	734	428	14,100	6,090	108	11	2
16-----	6	3,580	1,160	680	207	5,360	372	10,500	811	97	8	3
17-----	20	20,600	2,100	572	1,120	9,140	288	3,360	232	66	4	3
18-----	42	*36,600	5,920	410	2,040	8,240	206	4,750	138	66	3	110
19-----	35	*33,800	6,280	1,550	2,040	1,720	372	11,300	1,690	38	2	2
20-----	23	26,600	1,250	1,330	1,550	752	1,100	12,700	3,640	35	6	5
21-----	48	19,200	490	932	932	626	3,480	13,800	4,050	49	3	5
22-----	40	11,600	426	1,120	644	490	4,600	5,230	2,460	23	4	4
23-----	306	4,170	378	1,550	608	410	2,890	560	5,860	23	3	3
24-----	306	458	306	2,040	* 600	306	500	344	8,520	24	2	3
25-----	105	* 450	273	1,550	3,500	320	3,520	260	9,360	19	2	2
26-----	52	442	251	860	4,720	295	5,530	180	2,960	20	2	.9
27-----	30	196	284	572	8,900	348	2,920	168	400	16	* 2	1
28-----	20	207	295	475	12,200	273	620	138	232	14	2	4
29-----	13	218	273	410	-----	251	827	63	193	10	2	3
30-----	3	218	218	362	-----	207	386	219	108	10	3	2
31-----	5	-----	196	284	-----	4,350	-----	2,390	-----	43	2	-----

* Estimated.

Discharge, in second-feet, of Blackwater River at Blue Lick, Mo., 1928-33—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1929-30												
1-----	0.8	2,360	10	15	20	126	48	43	11	14	3.9	0.8
2-----	1.0	1,100	10	54	20	108	33	97	9	11	2.3	.9
3-----	2.4	34	10	260	20	86	38	75	8	9	2.3	1.0
4-----	6	92	10	108	86	62	24	55	7	6	2.3	1.0
5-----	2.3	63	6	54	485	29	33	28	7	4.0	2.0	1.1
6-----	2.8	52	6	34	795	57	40	18	8	2.9	1.8	1.1
7-----	3.3	34	10	26	5,410	43	28	18	138	2.6	1.6	779
8-----	5.1	31	15	20	7,060	86	20	16	43	67	1.4	590
9-----	6	25	20	20	7,860	80	25	19	26	27	1.6	168
10-----	150	40	20	26	7,990	71	22	17	18	13	1.4	62
11-----	246	22	26	26	4,750	80	20	372	14	9	1.0	50
12-----	731	23	27	26	2,230	54	14	683	7	5.7	1.8	24
13-----	156	19	34	34	1,220	39	23	102	5.4	4.2	7	126
14-----	92	36	30	34	1,180	23	16	56	5.7	3.0	1.5	80
15-----	52	32	21	34	470	22	14	26	9	3.0	1.4	699
16-----	21	23	24	34	168	30	50	16	18	3.0	1.6	386
17-----	19	25	21	26	80	44	114	14	156	3.0	1.1	114
18-----	15	28	18	20	358	43	156	32	102	3.3	.8	67
19-----	10	31	15	20	274	49	80	16	39	2.9	1.6	24
20-----	1,030	27	15	20	232	47	38	16	32	2.5	1.5	20
21-----	1,200	23	15	20	180	68	35	15	25	2.1	1.1	14
22-----	344	17	15	20	144	46	43	13	14	2.3	.8	7
23-----	86	14	15	20	126	25	28	14	12	2.4	.9	3.9
24-----	47	10	14	20	120	28	18	66	811	2.0	.8	1.2
25-----	16	13	14	20	168	120	23	75	996	46	.8	2.0
26-----	16	16	15	20	926	232	11	43	747	120	.8	5.1
27-----	113	19	13	20	274	108	20	21	180	38	.8	9
28-----	206	92	7	20	156	86	18	19	80	23	.9	4.2
29-----	515	6	10	20	-----	62	30	17	24	16	.8	3.3
30-----	1,090	10	15	20	-----	55	42	15	22	9	1.1	1.7
31-----	1,330	-----	15	20	-----	47	-----	13	-----	6	1.1	-----
1930-31												
1-----	2.2	1.3	260	5	4.5	26	386	70	126	3.0	1.3	12
2-----	1.0	2.6	219	4.5	3.3	21	386	56	75	3.0	.6	1,220
3-----	1.0	2.4	102	4.8	3.6	18	219	48	52	2.5	.5	996
4-----	2.5	2.6	97	3.6	3.3	16	132	47	35	2.2	.9	219
5-----	2.2	2.8	52	3.0	3.3	14	97	36	29	3.0	2.4	66
6-----	2.0	3.3	150	3.0	3.3	10	75	27	19	8	530	22
7-----	372	2.8	232	4.2	560	8	68	24	12	3.9	1,690	9
8-----	108	2.2	132	3.3	219	10	51	22	13	28	108	7
9-----	75	2.4	86	3.0	132	16	45	21	10	18	156	5
10-----	46	2.2	59	2.9	75	16	40	24	20	11	246	3.9
11-----	21	2.8	38	2.9	33	37	47	36	18	7	667	2.5
12-----	25	8	29	3.0	25	302	43	49	193	7	108	1.8
13-----	8	8	21	2.8	57	1,420	36	40	1,490	4.8	47	1.8
14-----	10	8	18	2.8	54	2,010	34	35	168	4.2	26	1.5
15-----	8	6	14	2.9	51	1,160	25	26	92	3.6	14	.9
16-----	10	8	14	3.3	37	545	24	20	3,080	3.6	4.8	.9
17-----	8	27	9	3.0	80	138	75	18	2,010	2.7	6	.9
18-----	12	16	8	2.9	138	108	59	14	150	1.7	4.8	1.2
19-----	31	14	8	3.0	168	92	34	372	92	1.7	5	.8
20-----	19	16	7	3.0	97	75	30	1,420	68	72	330	.6
21-----	15	456	6	3.3	57	56	102	1,480	55	16	206	.8
22-----	4.8	180	5	3.3	48	52	400	843	36	120	68	.9
23-----	6	73	5	3.3	36	57	260	1,920	17	49	23	40
24-----	4.8	55	6	4.5	32	58	114	1,490	13	18	18	3,200
25-----	3.0	28	5	5	50	49	92	316	10	11	8	2,430
26-----	3.6	13	5	5	71	41	138	168	6	5	18	330
27-----	2.6	14	4.8	5	52	51	316	114	6	3.3	14	45
28-----	1.5	8	4.8	4.8	37	219	260	92	4.5	2.3	8	29
29-----	2.4	8	4.8	5	-----	683	120	62	4.2	.9	6	17
30-----	2.2	39	4.5	4.2	-----	667	92	344	4.2	1.7	3.9	12
31-----	2.5	-----	3.9	4.5	-----	545	-----	156	-----	1.2	206	-----

* Estimated.

Discharge, in second-feet, of Blackwater River at Blue Lick, Mo., 1928-33—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1	12	1.0	323	2,940	78	70	19	22	2,230	122	22	35
2	8	2.0	208	3,370	64	66	14	19	2,920	48	6	24
3	7	2.0	168	1,220	74	83	17	19	200	17	6	9
4	5	1.0	144	359	107	73	14	18	1,060	8	4.4	9
5	3.4	.8	152	305	54	78	7	14	449	655	.9	8
6	2.3	.8	122	3,340	51	100	14	12	114	3,960	2.7	8
7	733	.8	107	2,920	76	60	13	11	305	5,280	3.6	4.8
8	114	1.0	114	693	85	48	12	16	152	2,970	3,370	4.1
9	48	1.4	107	287	100	34	12	10	60	176	2,830	4.4
10	23	5	323	137	89	29	12	18	893	89	451	5
11	56	6	287	200	114	24	10	25	3,430	55	100	4.8
12	114	6	251	184	1,120	21	13	40	2,000	29	61	4.4
13	287	5	251	269	467	16	12	25	137	10	342	142
14	995	33	176	467	144	20	10	14	1,040	12	2,670	24
15	287	28	192	234	114	26	8	8	152	9	2,120	64
16	107	122	130	152	160	42	10	5	89	10	212	635
17	62	200	107	176	853	55	9	3.9	57	2.3	212	198
18	33	3,750	100	287	1,120	51	11	3.2	41	2.3	240	49
19	26	4,450	100	234	323	57	46	2.9	15	3.2	403	24
20	17	1,700	86	144	192	57	64	2.9	144	4.2	226	9
21	13	184	107	144	152	58	60	2.3	3,820	2.9	74	6
22	9	1,670	130	137	144	56	93	1.2	3,750	1.6	27	4.3
23	8	4,370	93	137	137	57	80	.8	1,020	34	21	3.9
24	6	6,340	92	234	122	114	48	.9	130	50	12	3.7
25	5	9,040	86	144	107	122	73	2.1	84	37	9	3.7
26	3.9	9,680	83	107	93	89	81	3.6	60	19	9	3.8
27	4.6	3,230	60	137	90	68	79	2.7	72	8	3,400	5
28	2.7	953	62	323	66	48	55	2.1	431	5	3,000	6
29	4.2	953	58	251	63	43	40	1.0	107	3.2	763	4.4
30	4.2	503	52	176	-----	26	27	1.0	58	2.3	114	10
31	3.4	-----	160	67	-----	21	-----	1.2	-----	.9	61	-----
1932-33												
1	6	7	5	87	68	80	419	94	226	3.8	4.5	1.2
2	4.8	6	4.5	82	212	64	268	75	184	*3.3	3.1	1.0
3	4.4	4.4	4.4	56	156	53	149	44	156	2.8	584	1.2
4	3.9	4.4	15	51	94	47	128	20	107	2.7	268	1.2
5	3.8	4.3	6	61	49	25	107	170	94	2.4	68	1.2
6	3.8	4.5	11	52	44	69	801	1,260	74	2.2	6	1.1
7	3.7	5	7	42	35	1,200	880	312	44	2.0	3.9	1.0
8	3.4	1,050	4.2	40	21	3,820	342	184	26	1.8	3.2	1.2
9	3.2	327	3.8	38	11	2,100	184	107	9	1.6	3.3	1.1
10	5	198	3.8	30	11	451	149	43	9	1.6	2.4	1.0
11	4.4	80	3.8	27	7	226	107	820	4.5	1.4	1.6	1.0
12	6	42	3.8	22	7	212	87	3,920	8	1.6	1.9	1.1
13	14	20	3.8	16	7	184	70	5,080	3.8	1.5	1.6	1.5
14	8	12	3.8	15	7	170	212	6,600	11	1.4	1.3	467
15	6	12	3.2	13	11	128	689	3,400	3.9	1.6	1.0	240
16	4.5	9	3.2	19	11	94	297	550	3.9	1.6	1.1	54
17	4.2	7	3.2	16	16	68	163	372	3.7	1.6	1.4	5
18	3.8	7	3.2	20	35	61	114	282	3.4	1.7	1.1	3.6
19	3.6	6	3.2	370	725	61	100	1,060	2.7	1.4	1.1	2.8
20	3.4	6	3.8	120	1,720	62	75	357	2.7	1.4	1.2	2.4
21	3.4	7	3.8	357	1,050	61	297	2,780	2.7	1.3	1.2	1.8
22	3.5	6	4.0	1,130	403	44	689	5,570	2.6	1.4	1.4	1.4
23	3.9	8	2,300	983	240	57	297	5,570	2.5	1.4	1.3	1.7
24	4.4	7	5,130	282	163	79	198	1,770	2.5	1.6	1.4	2,700
25	4.4	8	6,100	156	30	1,940	142	2,940	*3	1.7	1.4	1,330
26	20	7	6,280	107	26	2,120	107	2,750	3.4	1.2	1.3	226
27	13	6	2,070	94	184	516	75	3,030	4.2	1.2	1.1	24
28	30	6	240	74	87	312	62	533	3.4	1.2	1.0	226
29	14	5	163	56	-----	198	52	419	3.4	1.4	1.3	11
30	10	5	135	51	-----	240	32	372	3.0	1.6	1.3	10
31	9	-----	107	56	-----	499	-----	327	-----	1.7	1.4	-----

* Estimated.

Discharge, in second-feet, of Blackwater River at Blue Lick, Mo., 1928-33—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1928-29						
October.....	306	0.6	35.1	0.031	0.04	2,160
November.....	36,600	.5	5,290	4.72	5.27	315,000
December.....	6,280	85	778	.695	.80	47,800
January.....	3,700	95	1,220	1.09	1.26	75,000
February.....	12,200	75	1,460	1.30	1.40	81,100
March.....	9,140	207	1,630	1.46	1.68	100,000
April.....	15,800	206	3,970	3.54	3.95	236,000
May.....	17,400	63	4,050	3.62	4.17	249,000
June.....	15,800	108	4,080	3.64	4.06	243,000
July.....	3,000	10	309	.276	.32	19,000
August.....	442	2	27.5	.025	.03	1,690
September.....	86	.9	11.7	.010	.01	696
The year.....	36,600	.5	1,890	1.69	22.99	1,370,000
1929-30						
October.....	1,330	.8	239	.213	.25	14,700
November.....	2,360	6	144	.129	.14	8,570
December.....	34	6	16.0	.014	.02	984
January.....	260	15	35.8	.032	.04	2,200
February.....	7,990	20	1,530	1.37	1.43	85,000
March.....	232	22	66.3	.059	.07	4,080
April.....	156	11	36.8	.033	.04	2,190
May.....	683	13	65.5	.058	.07	4,030
June.....	996	5.4	119	.106	.12	7,080
July.....	120	2	14.9	.013	.02	916
August.....	7	.8	1.61	.001	.00	99
September.....	779	.8	108	.096	.11	6,430
The year.....	7,990	.8	188	.168	2.31	136,000
1930-31						
October.....	372	1.0	26.2	.023	.03	1,610
November.....	456	1.3	33.7	.030	.03	2,010
December.....	260	3.9	51.9	.046	.05	3,190
January.....	5	2.8	3.70	.0033	.00	228
February.....	560	3.3	76.1	.068	.07	4,230
March.....	2,010	8	275	.246	.28	16,900
April.....	400	24	127	.113	.13	7,560
May.....	1,920	14	302	.270	.31	18,600
June.....	3,080	4.2	264	.236	.26	15,700
July.....	120	.9	13.5	.012	.01	830
August.....	1,690	.5	146	.130	.15	8,980
September.....	3,200	.6	289	.258	.29	17,200
The year.....	3,200	.5	134	.120	1.61	97,000
1931-32						
October.....	995	2.3	96.9	.087	.10	5,960
November.....	9,680	.8	1,570	1.40	1.55	93,400
December.....	323	52	143	.128	.15	8,790
January.....	3,370	67	638	.570	.63	39,200
February.....	1,120	51	227	.203	.2	12,600
March.....	122	16	55.2	.049	.06	3,390
April.....	93	7	32.1	.029	.03	1,910
May.....	40	.8	9.93	.0089	.0	611
June.....	3,820	15	834	.745	.83	49,600
July.....	5,280	.9	440	.393	.45	27,100
August.....	3,400	.9	670	.598	.69	41,200
September.....	635	3.7	43.9	.039	.0	2,610
The year.....	9,680	.8	396	.354	4.73	286,000
1932-33						
October.....	30	3.2	6.95	.0062	.007	427
November.....	1,050	4.3	62.5	.056	.06	3,720
December.....	6,260	3.2	729	.651	.75	44,800
January.....	2,120	13	243	.217	.25	14,900
February.....	1,720	7	194	.173	.18	10,800
March.....	3,820	25	492	.439	.51	30,300
April.....	880	32	243	.217	.24	14,500
May.....	6,600	20	1,640	1.46	1.68	101,000
June.....	226	2.5	33.6	.030	.03	2,000
July.....	3.8	1.2	1.78	.0016	.007	109
August.....	584	1.0	31.4	.028	.03	1,980
September.....	2,700	1.0	177	.158	.18	10,500
The year.....	6,600	1.0	324	.289	3.92	235,000

OSAGE (MARAIS DES CYGNES) RIVER BASIN

OSAGE RIVER NEAR QUENEMO, KANS.

LOCATION.—Chain gage in NW¼ sec. 7, T. 17 S., R. 18 E., 2½ miles below Dragoon Creek and 3 miles east of Quenemo.

DRAINAGE AREA.—1,030 square miles.

RECORDS AVAILABLE.—June 1922 to September 1933.

DISCHARGE.—Maximum during year, 7,590 second-feet May 19 (gage height, 25.12 feet); no flow Aug. 5-7.

1922-33: Maximum, 32,600 second-feet Nov. 17, 1928 (gage height, 38.38 feet); no flow at times. Bank-full stage, 27 feet.

REMARKS.—Records fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	1	1	10	1	5	47	46	116	1	1	16
2	12	2	2	9	1	4	29	38	83	1	1	556
3	10	2	2	8	1	8	14	31	62	1	1	742
4	6	3	1	4	1	4	14	52	50	1	1	216
5	4	2	1	4	1	5	11	59	40	1	0	100
6	4	2	1	4	1	8	9	67	33	1	0	62
7	4	2	1	3		7	8	68	25	1	0	31
8	2	2	1	2		8	8	40	26	2	2	21
9	2	2	1	2		8	8	34	22	2	2	14
10	5	2		2		5	4	29	18	122	2	10
11	4	2		2		8	4	24	14	86	2	9
12	3	1		3	a 1	6	3	206	14	78	1	7
13	2	1		2		5	4	2,280	10	23	1	58
14	2	1	a 1	2		5	2	616	6	14	1	244
15	2	1		2		4	2	187	5	10	1	55
16	2	1		2		3	2	93	4	6	1	1
17	2	1		2		4	2	67	4	5	1	7
18	2	1		2	2	6	2	5,080	4	5	1	26
19	2	1	2	2	2	6	2	6,700	3	3	1	15
20	2	1	2	2	2	5	6	3,320	2	2	1	12
21	2	1	3	2	3	6	1,130	496	1	2	6	8
22	2	1	2	2	5	6	3,280	436	1	2	93	8
23	2	1	7	b 2	6	4	1,170	301	1	1	206	6
24	2	1	14	2	6	5	244	263	1	1	263	6
25	2	1	12	1	5	6	168	997	2	1	196	5
26	3	1	6	1	4	7	122	416	2	1	122	4
27	2	1	8	1	5	6	93	244	1	1	71	4
28	2	1	10	2	4	10	72	168	2	1	32	4
29	3	1	18	1		12	69	1,220	1	1	26	132
30	3	1	10	1		17	59	263	1	1	18	86
31	2		8	1		79		168		1	15	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	16	2	3.71	228
November	2	1	1.37	81
December	18	1	3.94	242
January	10	1	2.74	169
February	10	1	2.18	121
March	79	3	8.77	540
April	3,280	2	220	13,100
May	6,700	24	774	47,600
June	116	1	18.5	1,100
July	122	1	12.2	750
August	263	0	34.5	2,120
September	742	1	82.2	4,890
The year	6,700	0	98.0	70,900

a Estimated.

b Interpolated.

OSAGE RIVER NEAR OTTAWA, KANS.

LOCATION.—Water-stage recorder in NW¼ sec. 6, T. 17 S., R. 20 W., 1½ miles southeast of Ottawa and three-quarters of a mile below Skunk Creek. Zero of gage is 852.6 feet above mean sea level.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—October 1918 to September 1933. August 1902 to October 1905 at Main Street Bridge at Ottawa.

DISCHARGE.—Maximum during year, 7,030 second-feet May 19 (gage height, 17.70 feet); no flow July 1-7.

1918-33: Maximum, 58,400 second-feet Nov. 17, 1928 (gage height, 38.65 feet); no flow at times in 1920, 1930, 1931, 1932, 1933. Bank-full stage, 27 feet.

REMARKS.—Records good except those for Oct. 21 to Dec. 29, Feb. 2, 3, Apr. 4, 6, 8-19, May 18-26 and days interpolated, which are fair. Stage-discharge relation affected by ice Dec. 11-29.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	5	3	20	12	9	60	61	126	0	4	6
2	16	5	4	17	•12	9	38	54	80	0	4	416
3	12	5	4	18	•11	9	24	39	55	0	7	732
4	12	5	4	17	11	9	•20	34	39	0	7	312
5	10	6	4	14	9	13	15	54	29	0	7	120
6	9	6	4	12	10	20	•14	42	21	0	6	60
7	7	5	4	12	9	46	12	64	15	0	4	36
8	8	7	4	10	10	27		56	10	9	4	20
9	8	5	4	10	9	21		46	5	32	3	12
10	10	5	4	9	7	17		38	7	62	3	9
11	9	4	•2	9	7	15	•8	52	6	122	4	7
12	8	3		8	6	15		416	5	51	4	6
13	8	3		8	5	15		2,400	4	22	3	7
14	9	3		9	4	13		1,160	4	12	3	92
15	8	4		9	4	12		307	2	8	2	146
16	7	4	•4	10	3	10		168	2	5	3	90
17	7	4		10	4	10		126	2	4	3	61
18	7	4		11	5	11		3,440	2	4	3	36
19	6	4		9	5	12		6,150	2	4	3	33
20	6	4		9	5	12	13	4,700	1	4	92	16
21	4	4	•6	9	4	12	473	•2,830	1	4	207	12
22	3	4		9	5	10	2,700	952	1	3	202	8
23	4	4		9	6	10	1,510	488	1	3	144	6
24	3	4		10	7	16	416	517	1	3	172	5
25	3	4		10	7	26	242	816	2	3	67	5
26	3	5	•6	10	5	19	170	2,040	2	3	95	6
27	4	5		10	8	15	128	502	2	3	78	4
28	3	4		11	10	15	103	488	1	3	135	4
29	4	4		11	-----	15	80	1,160	1	3	66	52
30	7	4		31	13	23	62	592	1	4	12	105
31	4	-----	26	13	-----	42	-----	213	-----	4	5	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	25	3	7.55	464
November	7	3	4.4 ^c	264
December	31	-----	5.48	337
January	20	8	11.2	686
February	12	3	7.1 ^d	397
March	46	9	16.4	1,010
April	2,700	-----	206	12,200
May	6,150	34	968	59,500
June	126	1	14.3	850
July	122	0	12.1	744
August	207	3	43.6	2,680
September	732	4	80.8	4,810
The year	6,150	0	116	83,900

^c Interpolated.

^d Estimated.

OSAGE RIVER AT TRADING POST, KANS.

LOCATION.—Chain gage in SE¼ sec. 5, T. 21 S., R. 25 E., at Trading Post, 1 mile above mouth of Big Sugar Creek.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—August 1921 to December 1923; October 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,480 second-feet May 22 (gage height, 16.25 feet); minimum, 1 second-foot several days in October, November, and July.

1921-23; 1928-33: Maximum, 120,000 second-feet Nov. 18, 1928 (gage height, 34.45 feet); no flow for several days in November 1931 and September 1931. Bank-full stage, 24 feet.

REMARKS.—Records good except those for Oct. 1 to Dec. 22, Feb. 13-17, Mar. 29 to Apr. 21, May 24, 25, July 14 to Aug. 2, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8	1	8	48	30	38	97	472	928	8	5	280
2	8	1	8	48	27	29	93	370	577	5	3	198
3	9	1	8	50	26	30	120	270	410	4	319	319
4	9	1	8	48	22	28	93	203	319	3	152	1,180
5	11	1	8	46	23	27	115	185	243	3	88	840
6	10	1	8	39	19	81	88	163	198	1	76	385
7	10	2	8	38		888	84	234	180	1	36	237
8	10	6		35		1,480	72	202	154	1	45	166
9	9	7		31		888	64	202	93	2,380	415	106
10	10	6		30	•20	577	66	180	64	2,650	232	98
11	9	5		31		353	48	137	28	688	112	109
12	8	4		26		296	46	1,700	38	297	65	52
13	8	2		23		243	40	8,200	39	256	42	98
14	8	5		21	23	194	42	8,120	32	132	29	965
15	8	8		25	21	163	38	6,750	26	85	16	445
16	6	10	•6	26	20	132	39	1,380	21	52	12	270
17	6	9		22	23	115	35	806	19	54	6	174
18	4	8		22	26	99	36	1,280	15	48	8	126
19	4	8		27	32	88	37	5,000	12	33	6	120
20	3	8		62	33	84	35	6,850	11	26	12	95
21	1	8		74	33	74	111	7,240	10	19	1,520	88
22	1	8		62	44	62	2,230	8,320	10	14	1,420	120
23	1	8	46	54	56	58	4,700	4,820	9	10	545	101
24	1	8	91	46	52	60	3,380	2,380	9	8	385	2,900
25	2	8	172	40	90	84	1,190	1,520	8	7	270	90
26	4	8	238	37	64	238	690	5,540	9	7	280	67
27	4	8	212	33	48	347	506	7,740	9	6	270	40
28	2	7	128	29	40	230	382	6,200	9	5	185	32
29	1	8	88	29		154	302	2,580	18	3	297	27
30	1	8	76	29		120	254	4,040	34	2	415	19
31	1		56	29		99		2,780		2	308	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	12	1	5.7	351
November	10	1	5.8	343
December	238		40.4	2,490
January	90	21	37.4	2,300
February	74	19	31.9	1,770
March	1,480	27	237	14,600
April	4,700	35	501	29,800
May	8,320	137	3,090	190,000
June	928	8	118	7,010
July	2,650	1	220	13,500
August	1,520	4	244	15,000
September	2,900	19	325	19,300
The year	8,320	1	410	296,000

• Estimated.

OSAGE RIVER AT OSCEOLA, MO.

LOCATION.—Water-stage recorder in NE¼NE¼ sec. 17, T. 38 N., R. 25 W., 1 mile northeast of Osceola. Zero of gage is 679.7 feet above mean sea level (revised).

DRAINAGE AREA.—8,220 square miles.

RECORDS AVAILABLE.—November 1930 to September 1933; July 1921 to September 1928 at site 1 mile upstream.

DISCHARGE.—Maximum during year, 37,200 second-feet May 16 (gage height, 21.17 feet); minimum, 10 second-feet Oct. 24 (gage height, 0.45 foot).

1921–28, 1930–33: Maximum, 70,900 second-feet Apr. 11, 1927 (gage height, 30.4 feet at old location); minimum, 10 second-feet several days during June and July 1931, Oct. 24, 1932.

REMARKS.—Records good. Flow regulated by hydroelectric plant of West Missouri Power Co. 1 mile upstream.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	163	201	265	2,990	2,480	868	1,090	2,550	14,500	760	235	1,230
2.....	129	174	192	2,470	2,450	779	1,080	2,390	11,000	484	609	1,050
3.....	71	157	203	2,110	2,420	664	966	2,260	5,970	471	1,370	2,460
4.....	214	199	192	2,000	2,180	695	761	2,000	3,640	461	2,570	7,630
5.....	78	175	190	1,780	2,000	647	1,530	2,000	2,930	358	2,660	6,430
6.....	93	112	152	1,670	1,830	1,100	6,050	1,880	2,390	315	1,250	4,400
7.....	148	242	136	1,570	1,630	4,100	9,640	1,880	2,130	313	796	2,320
8.....	120	264	142	1,240	1,700	10,100	7,310	1,750	1,880	599	503	1,450
9.....	87	282	156	1,180	1,670	11,600	4,630	1,630	1,600	1,460	491	828
10.....	101	214	184	1,310	1,570	8,720	3,120	1,550	1,440	7,240	445	430
11.....	105	283	158	957	1,360	5,590	2,510	1,390	917	8,010	1,240	571
12.....	103	294	175	899	1,210	3,720	2,110	7,100	1,010	4,320	1,270	412
13.....	98	265	150	938	1,370	2,990	1,800	24,600	890	2,240	635	459
14.....	73	255	150	931	1,150	2,570	1,930	29,400	890	1,580	552	272
15.....	87	214	148	837	1,160	2,140	2,130	34,100	643	609	414	605
16.....	77	193	146	659	1,340	2,100	3,610	36,900	736	709	215	1,260
17.....	84	223	134	870	1,270	1,780	9,170	36,400	669	546	368	714
18.....	70	241	155	1,300	1,350	1,650	9,800	29,200	604	1,090	194	576
19.....	79	189	159	2,140	1,220	1,590	6,180	18,300	563	1,660	200	434
20.....	76	141	149	3,560	1,410	1,150	5,210	12,700	518	1,820	248	347
21.....	72	192	150	5,220	1,280	1,400	9,980	12,200	464	1,080	510	225
22.....	64	169	371	12,700	1,200	1,060	13,600	12,200	457	327	1,060	208
23.....	50	217	3,490	12,500	1,030	1,050	13,400	12,000	328	595	1,580	287
24.....	46	188	22,300	8,690	1,170	1,200	12,100	15,200	502	452	795	435
25.....	319	178	26,600	6,740	1,380	1,250	10,000	14,000	303	1,140	653	461
26.....	286	331	33,200	6,820	1,150	857	6,820	18,900	332	604	365	359
27.....	1,000	297	29,400	5,820	1,450	1,410	4,740	20,600	447	402	668	953
28.....	1,010	265	11,000	4,240	1,070	1,520	3,840	16,200	2,170	516	870	1,530
29.....	514	256	5,890	3,390	-----	1,310	3,200	18,900	5,060	225	606	2,210
30.....	311	191	4,230	2,840	-----	1,150	2,810	21,300	1,850	238	915	6,560
31.....	248	-----	3,450	2,580	-----	1,100	-----	16,500	-----	288	1,800	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	1,010	46	193	0.023	0.03	11,900
November.....	331	112	220	.027	.03	13,100
December.....	33,200	134	4,630	.563	.65	285,000
January.....	12,700	659	3,320	.404	.47	204,000
February.....	2,480	1,030	1,520	.185	.19	84,400
March.....	11,600	647	2,510	.305	.35	154,000
April.....	13,600	761	5,370	.653	.73	320,000
May.....	36,900	1,390	13,800	1.68	1.94	848,000
June.....	14,500	303	2,230	.271	.30	133,000
July.....	8,010	225	1,320	.161	.19	81,200
August.....	2,660	194	842	.102	.12	51,800
September.....	7,630	208	1,570	.191	.21	93,400
The year.....	36,900	46	3,150	.383	5.21	2,280,000

OSAGE RIVER NEAR BAGNELL, MO.

LOCATION.—Water-stage recorder in N½SE¼ sec. 21, T. 40 N., R. 15 W., 1½ miles above Bagnell. Zero of gage is 549.75 feet above mean sea level.

DRAINAGE AREA.—14,000 square miles.

RECORDS AVAILABLE.—May 1925 to September 1933.

DISCHARGE.—Maximum during year, 56,900 second-feet May 26 (gage height, 23.44 feet); minimum, 249 second-feet July 8 (gage height, 2.13 feet).

1925-33: Maximum, 106,000 second-feet Apr. 17, 1927, May 21, 1929; maximum gage height, 36.61 feet Apr. 17, 1927; minimum, 220 second-feet June 12, 1932 (gage height, 2.12 feet).

Maximum stage known, 43.1 feet in June 1844 (discharge, about 150,000 second-feet).

REMARKS.—Records excellent. Flow regulated by hydroelectric plant of Union Electric Light & Power Co. 2 miles upstream. Discharge Oct. 1, 2, computed from records of this plant.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	660	1,750	1,170	4,780	10,600	10,600	3,940	5,940	19,500	835	3,020	2,960
2-----	650	1,660	1,160	4,200	15,200	10,400	1,520	7,000	18,900	625	3,020	1,450
3-----	1,000	1,530	1,830	9,290	15,100	11,900	4,960	6,440	13,000	690	3,020	1,150
4-----	2,190	1,210	912	10,900	12,000	8,320	5,690	6,610	5,730	460	4,440	1,160
5-----	2,560	884	1,010	10,900	8,510	2,480	6,090	5,630	10,500	538	2,470	3,680
6-----	2,220	710	1,480	12,000	16,300	9,340	5,570	4,020	12,100	835	717	5,340
7-----	1,500	1,650	1,280	10,300	14,200	12,900	4,720	1,780	11,300	595	2,720	5,420
8-----	716	1,790	1,380	5,670	13,200	13,000	2,560	4,820	10,300	392	3,140	5,460
9-----	713	3,780	4,670	10,800	15,200	13,400	1,210	6,140	10,000	658	2,850	4,440
10-----	1,120	1,640	5,760	13,200	14,400	12,400	5,850	6,200	7,710	5,730	2,740	1,270
11-----	2,280	1,310	2,030	12,200	11,800	9,950	5,890	6,240	3,780	3,460	3,150	5,350
12-----	2,130	938	5,940	12,700	5,720	5,960	5,250	6,640	6,350	1,610	1,850	6,890
13-----	1,620	722	4,580	12,400	11,300	10,400	4,940	11,200	4,440	2,070	920	6,448
14-----	1,270	1,110	4,350	10,600	11,500	13,100	5,840	5,740	3,160	1,610	3,830	6,100
15-----	841	3,110	3,780	5,890	9,240	11,800	4,050	12,200	3,020	760	4,380	5,160
16-----	756	1,550	4,300	9,720	8,440	11,800	1,420	19,500	3,310	658	4,000	2,370
17-----	2,160	1,170	4,300	9,730	8,570	10,600	4,160	33,100	3,940	1,950	4,280	1,540
18-----	2,270	1,090	1,150	9,660	6,230	10,400	4,600	43,100	1,090	3,310	3,290	5,310
19-----	2,290	996	3,280	11,700	2,240	5,710	3,820	31,900	3,160	2,740	1,090	6,000
20-----	1,990	628	3,520	11,900	8,770	11,500	4,170	22,200	2,200	3,020	856	4,180
21-----	2,030	1,040	3,210	10,200	9,350	10,000	7,360	19,300	2,330	2,740	2,930	3,370
22-----	1,110	2,030	3,180	6,400	6,350	10,600	5,550	16,700	2,600	1,720	3,130	3,120
23-----	707	2,130	4,800	12,800	8,650	8,560	2,050	15,400	2,600	658	2,360	1,300
24-----	2,180	703	8,670	13,600	8,740	8,820	8,230	34,500	915	2,880	2,730	750
25-----	4,030	1,470	5,830	14,700	7,490	5,390	8,940	33,900	538	3,310	2,900	3,830
26-----	2,330	1,010	13,200	15,500	5,140	3,240	8,980	51,200	1,230	2,740	839	4,860
27-----	1,840	825	27,100	14,800	9,180	6,440	8,680	43,200	1,610	2,070	978	2,410
28-----	1,060	1,680	30,700	11,800	10,700	7,110	6,640	32,300	1,500	2,070	3,200	3,290
29-----	983	1,890	12,000	5,960	-----	6,860	5,180	25,300	1,040	1,040	3,590	1,820
30-----	793	1,220	11,700	11,500	-----	6,870	1,910	33,100	760	538	3,210	2,710
31-----	2,400	-----	9,590	14,200	-----	5,730	-----	20,600	-----	2,460	3,110	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	4,030	650	1,630	100,000
November-----	3,780	628	1,440	85,700
December-----	30,700	912	6,060	373,000
January-----	15,500	4,200	10,600	652,000
February-----	16,300	2,240	10,100	561,000
March-----	13,400	2,480	9,210	566,000
April-----	8,980	1,210	4,990	297,000
May-----	51,200	1,780	18,400	1,130,000
June-----	19,500	538	5,620	334,000
July-----	5,730	392	1,770	109,000
August-----	4,440	717	2,730	168,000
September-----	6,890	750	3,640	217,000
The year-----	51,200	392	6,380	4,590,000

OSAGE RIVER NEAR ST. THOMAS, MO.

LOCATION.—Water-stage recorder in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 35, T. 42 N., R. 12 W., half a mile below Sugar Creek and 2 $\frac{1}{2}$ miles south of St. Thomas. Zero of gage is about 528.0 feet above mean sea level.

DRAINAGE AREA.—14,500 square miles.

RECORDS AVAILABLE.—August 1931 to September 1933.

DISCHARGE.—Maximum during year, 59,900 second-feet May 26 (gage height, 21.30 feet); minimum, 485 second-feet July 9 (gage height, 1.37 feet).

1931-33: Maximum, that of May 26, 1933; minimum, 420 second-feet Aug. 27, 1931 (gage height, 1.30 feet).

Maximum stage known, about 39.7 feet in June 1844.

REMARKS.—Records excellent. Flow regulated by hydroelectric plant of Union Electric Light & Power Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul ⁷	Aug.	Sept.
1-----	800	2,350	1,280	8,730	14,400	11,100	5,350	2,860	20,900	942	2,350	3,260
2-----	701	1,870	1,180	3,840	15,000	11,000	4,860	6,860	20,700	900	3,180	3,430
3-----	644	1,670	1,220	6,020	15,900	11,600	2,930	7,120	16,000	816	3,300	1,700
4-----	911	1,590	1,850	10,600	13,800	10,700	5,950	6,900	9,320	747	3,780	1,340
5-----	2,160	1,300	1,100	11,300	10,500	6,970	6,590	6,980	8,340	603	4,130	1,370
6-----	2,670	982	1,010	12,200	12,800	4,850	6,400	5,580	12,400	595	2,500	4,310
7-----	2,300	804	1,410	11,900	15,800	13,600	5,940	4,220	12,400	771	1,070	5,460
8-----	1,580	1,450	1,250	9,010	13,800	15,900	4,780	3,120	11,400	764	2,920	5,530
9-----	1,020	1,800	1,530	8,420	15,300	14,700	2,990	5,980	10,900	551	3,020	5,980
10-----	814	3,870	6,020	12,300	14,900	13,700	2,620	6,510	9,540	1,570	3,020	3,880
11-----	1,060	1,740	3,840	13,300	13,100	11,900	6,690	6,560	6,620	5,420	3,130	1,760
12-----	2,250	1,360	2,630	12,900	9,540	9,350	5,970	9,730	4,720	3,220	3,110	6,900
13-----	2,250	1,010	5,830	12,800	7,990	8,060	5,600	25,400	5,790	1,790	2,010	7,050
14-----	1,720	793	4,550	11,200	12,000	12,700	5,770	21,600	4,340	2,160	1,340	6,080
15-----	1,300	1,270	4,200	9,170	9,550	13,400	5,990	15,800	3,270	1,650	4,120	6,470
16-----	1,100	2,950	4,110	7,310	9,210	12,500	7,850	22,900	3,350	894	4,210	4,400
17-----	950	1,580	4,500	10,000	8,680	11,700	4,850	27,300	3,440	791	4,180	2,880
18-----	2,050	1,200	4,390	11,000	7,360	11,900	5,980	44,300	3,850	2,380	4,090	2,120
19-----	2,350	1,180	1,340	15,900	6,260	12,000	5,510	40,100	1,720	3,450	3,230	6,270
20-----	2,400	1,060	3,310	13,800	4,520	9,420	4,630	26,400	3,340	3,030	1,310	5,470
21-----	2,150	817	3,620	13,000	9,310	11,800	6,620	21,300	2,510	3,100	1,060	4,130
22-----	2,150	1,000	3,350	15,200	7,810	10,900	7,870	21,200	2,770	2,770	3,040	3,710
23-----	1,190	2,090	5,870	10,700	8,200	10,600	6,070	14,900	2,870	1,890	3,190	5,980
24-----	848	2,180	16,100	15,300	9,000	9,410	4,770	31,400	2,660	1,220	2,510	2,400
25-----	2,700	947	13,000	15,500	8,030	8,190	9,770	47,200	1,210	3,170	2,860	1,470
26-----	4,000	1,430	8,870	17,000	7,700	4,710	9,960	52,700	751	3,390	2,900	4,660
27-----	2,580	1,160	25,300	16,000	6,720	4,130	9,580	54,100	1,210	2,820	1,090	5,060
28-----	1,920	917	32,900	14,800	8,610	6,460	8,410	39,900	1,680	2,220	1,050	3,090
29-----	1,380	1,590	18,000	9,860	-----	6,340	6,160	31,500	1,580	2,100	3,390	3,280
30-----	1,030	1,920	12,300	8,600	-----	6,730	5,270	32,700	1,170	1,190	3,660	2,300
31-----	899	-----	11,200	13,900	-----	6,410	-----	26,600	-----	719	3,360	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	4,000	644	1,670	103,000
November-----	3,870	793	1,530	91,000
December-----	32,900	1,010	6,680	411,000
January-----	17,000	3,840	11,700	719,000
February-----	15,900	4,520	10,600	589,000
March-----	15,900	4,130	10,100	621,000
April-----	9,960	2,620	6,060	361,000
May-----	54,100	2,860	21,600	1,330,000
June-----	20,900	751	6,360	378,000
July-----	5,420	551	1,860	114,000
August-----	4,210	1,050	2,840	17,500
September-----	7,050	1,340	4,060	242,000
The year-----	54,100	551	7,080	4,980,000

MARMATON RIVER NEAR FORT SCOTT, KANS.

LOCATION.—Chain gage in NW¼ sec. 21, T. 25 S., R. 25 E., 2 miles northeast of Fort Scott and 2½ miles west of Kansas-Missouri State line.

DRAINAGE AREA.—411 square miles.

RECORDS AVAILABLE.—August 1921 to June 1925; April 1929 to September 1933.

DISCHARGE.—Maximum during year, 9,700 second-feet Sept. 29 (gage height, 31.40 feet); minimum, 1 second-foot Oct. 1-24, Oct. 28 to Nov. 7, Nov. 10-20, Nov. 23 to Dec. 15.

1921-25; 1929-33: Maximum, 24,400 second-feet May 12, 1929 (gage height, 37.04 feet); minimum, 0.3 second-foot Sept. 4, 1932 (gage height, 2.24 feet). Bank-full stage, 34.0 feet.

Maximum stage known, 42.34 feet in 1915.

REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 10-23, Feb. 7-14.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1	1	1	27	44	38	54	112	238	2	9	200
2	1	1	1	25	42	38	54	81	179	2	9	7,980
3	1	1	1	22	34	33	52	71	131	2	9	1,000
4	1	1	1	21	32	34	43	57	98	2	12	500
5	1	1	1	20	29	62	1,290	71	78	2	13	205
6	1	1	1	18	29	86	1,140	81	63	2	9	150
7	1	1	1	15		1,140	424	71	47	2	5	112
8	1	9	1	14		1,230	271	66	40	2	3	96
9	1	4	1	14		464	205	49	33	314	3	71
10	1	1		12		271	172	47	26	271	* 2	53
11	1	1		11	* 30	205	122	21	109	2	41	
12	1	1	b 1	9		183	106	2,670	18	63	3	61
13	1	1		6		161	91	4,570	17	* 50	2	293
14	1	1		6		139	106	2,210	9	37	2	464
15	1	1		5	71	101	106	796	10	16	2	134
16	1	1		3	71	91	* 90	434	11	9	2	48
17	1	1		5	81	81	76	282	11	5	2	56
18	1	1		10	128	71	66	568	4	166	* 2	54
19	1	1		38	101	76	71	580	4	227	2	51
20	1	1	b 2	41	101	66	454	227	3	58	2	36
21	1	2		53	86	62	1,640	161	3	17	4	34
22	1	2		580	71	56	859	150	2	8	3	27
23	1	1		227	56	54	324	134	3	3	3	194
24	1	1	1,000	134	54	47	260	324	3	154	2	71
25	30	1	660	128	58	81	227	260	4	142	2	39
26	15	1	194	139	56	81	183	475	3	68	2	40
27	2	1	101	91	50	76	139	282	3	30	12	44
28	1	1	71	66	46	56	117	1,750	2	46	1,060	1,500
29	1	1	54	58		54	101	4,680	2	18	628	9,150
30	1	1	43	50		59	122	1,230	2	11	216	2,100
31	1		32	47		60		334		8	139	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	30	1	2.42	149
November	9	1	1.43	85
December	1,000	1	70.5	4,340
January	580	3	61.1	3,760
February	128	29	529	2,940
March	1,230	33	170	10,400
April	1,640	43	299	17,800
May	4,680	47	815	50,100
June	238	2	35.6	2,120
July	314	2	59.5	3,660
August	1,060	2	69.9	4,300
September	9,150	27	827	42,200
The year	9,150	1	206	149,000

* Interpolated.

b Estimated.

SAC RIVER NEAR STOCKTON, MO.

LOCATION.—Chain gage in W½ sec. 11, T. 34 N., R. 26 W., at bridge on State highway 54, 2½ miles east of Stockton.

DRAINAGE AREA.—1,160 square miles.

RECORDS AVAILABLE.—July 1921 to September 1933.

DISCHARGE.—Maximum during year, 30,400 second-feet Dec. 25 (gage height, 23.48 feet); minimum, 57 second-feet Oct. 23 (gage height, 2.16 feet).

1921-33: Maximum, 34,800 second-feet Apr. 1, 1927 (gage height, 24.95 feet); minimum, 25 second-feet Sept. 10, 1925 (gage height, 1.62 feet). Average, 12 years, 1,190 second-feet.

Maximum stage known, 29.3 feet in July 1909.

REMARKS.—Records good except those estimated, Oct. 24, Nov. 4, Dec. 22, Feb. 3, June 24, Aug. 25, and those for periods of ice effect, Dec. 11-18, Feb. 9-11, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	122	130	1,550	1,420	324	361	1,240	2,170	444	164	142
2	60	103	139	1,360	1,360	324	361	1,110	1,800	361	256	213
3	60	103	148	1,300	1,210	306	342	990	1,550	324	3,990	5,320
4	85	104	148	1,240	1,050	306	342	990	1,300	306	2,740	1,180
5	88	105	130	1,050	928	306	749	990	1,240	272	1,240	693
6	71	112	114	928	807	324	2,490	867	1,050	256	361	490
7	79	112	114	807	749	1,110	1,610	807	990	256	306	361
8	74	141	107	749	749	2,050	1,300	693	807	226	256	306
9	68	146	122	749	750	1,420	1,110	640	749	6,517	241	256
10	66	124	122	693	750	1,300	928	589	693	4,060	213	226
11	60	128	110	640	750	1,110	867	2,170	640	1,189	200	213
12	60	124	100	589	749	990	693	1,180	564	589	188	200
13	66	120	90	539	640	928	666	4,690	539	490	241	200
14	64	105	80	514	589	807	693	19,100	514	401	200	200
15	60	120	70	490	490	693	928	15,600	444	361	188	289
16	64	124	60	467	467	666	6,760	17,300	444	361	176	200
17	61	124	60	444	467	614	8,640	18,200	444	256	176	176
18	61	116	80	444	467	589	4,560	4,340	401	289	164	164
19	61	116	96	1,360	444	539	3,460	3,330	361	272	153	153
20	65	109	103	1,300	381	539	4,970	2,680	324	256	153	142
21	67	116	103	1,300	401	514	6,680	2,550	324	226	153	132
22	65	109	103	2,300	381	490	4,900	2,170	306	213	153	132
23	57	116	1,120	306	361	467	3,460	1,860	289	200	164	132
24	64	157	19,100	2,110	342	467	2,940	1,980	272	200	153	132
25	72	270	30,400	2,300	361	467	2,420	5,700	256	200	138	124
26	210	224	5,620	2,940	361	401	2,170	11,000	241	241	122	106
27	532	196	3,590	2,300	361	381	1,920	4,480	241	188	142	749
28	224	182	2,810	2,050	342	361	1,670	3,330	5,850	188	132	807
29	170	170	2,300	1,730	-----	361	1,420	8,430	1,050	176	188	4,830
30	130	157	1,980	1,420	-----	361	1,360	3,720	640	164	213	1,180
31	130	.	1,980	1,300	-----	361	-----	2,880	-----	164	176	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	532	57	98.5	0.085	0.10	6,060
November	270	103	135	.116	.13	8,030
December	30,400	60	2,300	1.98	2.28	141,000
January	2,940	444	1,280	1.10	1.27	78,700
February	1,420	342	647	.558	.58	35,900
March	2,050	306	641	.553	.64	39,400
April	8,640	342	2,360	2.03	2.26	140,000
May	19,100	589	4,700	4.05	4.67	289,000
June	5,850	241	883	.761	.85	52,500
July	6,510	164	631	.544	.63	38,800
August	3,990	122	430	.371	.43	26,400
September	5,320	106	648	.559	.62	38,600
The year	30,400	57	1,240	1.07	14.46	894,000

POMME DE TERRE RIVER AT HERMITAGE, MO.

LOCATION.—Chain gage in SW¼ sec. 24, T. 37 N., R. 22 W., at bridge on State highway 64 at Hermitage.

DRAINAGE AREA.—655 square miles.

RECORDS AVAILABLE.—July 1921 to September 1933.

DISCHARGE.—Maximum during year, 17,100 second-feet Dec. 25 (gage height, 22.20 feet); minimum, 6 second-feet Oct. 7, 16, 21; minimum gage height, 1.47 feet Oct. 7.

1921-33: Maximum, about 40,000 second-feet Aug. 8, 1927 (gage height, 36.45 feet); minimum, 1 second-foot Sept. 8-10, 1925. Average, 12 years, 676 second-feet.

REMARKS.—Records fair. Discharge estimated for Dec. 8 and for periods of ice effect, Dec. 11-22, Feb. 9-15.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	12	27	49	724	520	146	278	387	560	92	19	32
2.....	10	30	52	485	856	137	339	339	419	68	21	30
3.....	10	24	49	419	520	123	308	293	339	52	168	168
4.....	8	23	46	387	451	114	278	264	278	39	3,010	278
5.....	8	26	43	339	387	105	264	308	235	39	419	278
6.....	7	29	40	308	323	114	1,120	308	194	26	208	264
7.....	6	22	40	264	293	945	812	293	168	29	144	154
8.....	7	37	37	250	235	2,540	560	264	139	29	111	68
9.....	16	26	34	222	215	1,350	419	235	123	33	90	54
10.....	10	34	29	208	195	856	355	208	114	1,040	78	40
11.....	8	37	25	181	175	640	278	208	105	371	120	34
12.....	8	31	25	168	156	520	250	600	96	235	74	32
13.....	10	34	30	151	156	451	222	6,390	84	132	66	30
14.....	8	37	30	146	165	403	208	13,400	78	88	58	32
15.....	7	43	25	142	175	339	308	7,600	70	68	50	28
16.....	6	46	25	132	181	293	5,770	7,110	66	56	58	130
17.....	7	43	25	127	168	264	4,440	2,600	54	48	45	74
18.....	8	49	25	137	156	250	2,210	1,550	50	42	38	36
19.....	8	46	20	1,170	156	250	1,500	1,040	52	45	34	39
20.....	7	40	20	1,400	156	485	1,120	724	52	36	32	29
21.....	6	48	20	1,120	151	355	5,130	520	48	34	32	26
22.....	8	44	20	3,530	146	278	2,890	945	45	30	28	20
23.....	8	46	500	2,160	137	264	1,800	451	42	25	25	17
24.....	7	43	10,500	1,220	123	250	1,300	485	39	28	23	19
25.....	8	109	14,400	1,350	132	250	1,040	2,260	33	23	21	17
26.....	12	126	2,190	2,430	156	250	812	8,100	31	21	14	15
27.....	308	94	1,320	1,260	168	250	680	2,320	600	30	19	17
28.....	103	86	960	856	156	222	520	1,220	451	40	18	724
29.....	70	72	760	640	-----	222	451	2,540	419	30	21	2,890
30.....	50	58	605	560	-----	208	419	1,550	156	25	28	724
31.....	44	-----	570	451	-----	194	-----	900	-----	21	40	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	308	6	25.6	0.039	0.04	1,570
November.....	126	22	47.0	.072	.08	2,800
December.....	14,400	20	1,050	1.60	1.84	64,600
January.....	3,530	127	740	1.13	1.30	45,500
February.....	856	123	243	.371	.39	13,500
March.....	2,540	105	422	.644	.74	25,900
April.....	5,770	208	1,200	1.83	2.04	71,400
May.....	13,400	208	2,110	3.22	3.71	130,000
June.....	600	31	171	.261	.29	10,200
July.....	1,040	21	92.7	.142	.16	5,700
August.....	3,010	14	165	.252	.29	10,100
September.....	2,890	15	210	.321	.36	12,500
The year.....	14,400	6	544	.831	11.24	394,000

SOUTH GRAND RIVER NEAR BROWNINGTON, MO.

LOCATION.—Chain gage in NW¼ sec. 17, T. 40 N., R. 25 W., 500 feet below Deepwater Creek and 1 mile north of Brownington. Zero of gage is 677.1 feet above mean sea level.

DRAINAGE AREA.—1,660 square miles.

RECORDS AVAILABLE.—June 1921 to September 1933.

DISCHARGE.—Maximum during year, 4,840 second-feet May 13 (gage height, 11.94 feet); minimum, 0.4 second-foot July 29–31; minimum gage height, 0.92 foot July 30, 31.

1921–33: Maximum, 40,000 second-feet Nov. 19, 1928 (gage height, 39.9 feet); minimum, 0.4 second-foot July 29–31, 1933. Average, 12 years, 917 second-feet.

REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 11–21, Feb. 9–15, discharge estimated.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	28	12	4.0	56	92	220	348	364	478	8	0.6	2.2
2.....	18	8	3.8	64	84	150	287	196	331	15	1.2	7
3.....	10	6	2.9	48	150	128	233	114	260	10	1.7	16
4.....	7	4.4	2.8	48	118	97	184	82	208	8	104	8
5.....	4.9	4.4	2.3	47	80	82	233	124	172	4.8	94	4.8
6.....	3.5	4.2	2.3	43	73	128	1,990	850	139	4.0	38	4.6
7.....	2.8	3.8	2.2	38	49	2,650	1,450	609	110	2.9	21	3.5
8.....	2.2	7	1.9	29	30	3,640	655	400	87	2.3	16	2.8
9.....	1.8	74	1.7	27	26	3,260	400	273	71	2.2	13	2.1
10.....	1.5	101	1.2	26	23	1,880	301	184	58	2.0	9	1.8
11.....	1.5	63	.9	22	20	655	233	137	46	1.8	54	1.6
12.....	1.3	33	.9	20	18	419	184	301	38	1.6	77	1.5
13.....	2.2	22	.9	18	20	348	150	4,840	30	1.4	34	1.4
14.....	2.5	16	1.3	18	24	301	196	3,750	26	1.3	68	1.2
15.....	2.3	11	1.3	16	30	260	287	3,090	33	1.1	45	1.1
16.....	2.0	8	1.3	13	34	208	287	1,660	30	.9	24	1.0
17.....	1.5	8	1.3	12	74	172	208	850	22	.8	18	16
18.....	1.3	6	1.3	36	137	148	112	161	16	1.0	14	18
19.....	1.1	6	1.3	950	208	137	132	800	12	1.4	8	12
20.....	1.0	4.9	1.3	1,200	382	128	139	950	9	1.2	6	7
21.....	.9	4.4	1.3	750	520	118	900	655	7	1.1	4.6	4.0
22.....	.9	4.2	1.8	2,480	499	104	1,200	1,770	5	1.0	4.4	2.9
23.....	.8	4.2	750	1,150	382	95	702	2,760	5	.8	4.0	382
24.....	.7	4.0	3,750	419	273	90	438	3,310	4.4	.8	3.0	184
25.....	1.7	4.4	3,200	382	364	161	316	3,420	3.8	.8	2.5	438
26.....	20	4.6	2,320	246	2,380	850	260	4,360	3.5	.7	2.0	287
27.....	79	4.4	1,250	184	1,150	1,000	196	3,700	702	.6	1.7	316
28.....	56	4.4	499	128	348	542	161	4,190	43	.5	2.9	260
29.....	34	4.4	260	103	-----	316	128	4,780	20	.4	4.0	1,200
30.....	22	4.2	184	82	-----	287	246	2,540	12	.4	3.6	419
31.....	16	-----	124	87	-----	95	-----	1,050	-----	.4	3.0	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	79	0.7	10.6	0.0064	0.007	652
November.....	101	3.8	14.9	.0090	.01	887
December.....	3,750	.9	399	.240	.28	24,500
January.....	2,480	12	282	.170	.20	17,300
February.....	2,380	18	271	.163	.17	15,100
March.....	3,640	82	602	.363	.42	37,000
April.....	1,990	112	419	.252	.28	24,900
May.....	4,840	82	1,690	1.02	1.18	104,000
June.....	702	3.5	99.4	.060	.07	5,910
July.....	15	.4	2.55	.0015	.002	157
August.....	104	.6	22.0	.013	.02	1,350
September.....	1,200	1.0	120	.072	.08	7,140
The year.....	4,840	.4	330	.199	2.72	239,000

NIANGUA RIVER NEAR DECATURVILLE, MO.

LOCATION.—Water-stage recorder in SE¼ sec. 18, T. 37 N., R. 17 W., 8 miles west of Decaturville. Zero of gage is 665.9 feet above mean sea level.

DRAINAGE AREA.—627 square miles.

RECORDS AVAILABLE.—April 1930 to September 1933.

DISCHARGE.—Maximum during year, 19,400 second-feet May 15 (gage height, 16.30 feet); minimum, 9 second-feet Nov. 28 (gage height, 1.84 feet).

1930-33: Maximum, 22,000 second-feet June 28, 1932 (gage height, 17.00 feet); minimum, 9 second-feet Nov. 28, 1932 (gage height, 1.84 feet).

REMARKS.—Records excellent. Flow regulated by hydroelectric plant of Missouri Electric Power Co. half a mile upstream. Discharge computed from power plant records Dec. 18, 19, Feb. 9-13.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	145	259	190	710	550	228	302	672	912	246	154	52
2	113	121	217	732	600	247	551	564	800	238	222	200
3	132	136	197	612	613	242	600	404	717	240	398	55
4	161	158	160	548	571	249	530	505	580	250	612	115
5	153	232	206	490	436	230	513	447	631	191	975	220
6	134	74	165	469	509	367	466	446	568	215	432	169
7	133	124	164	452	416	406	482	367	476	173	424	173
8	123	209	164	358	433	1,110	518	457	518	201	315	171
9	132	156	159	406	400	1,490	406	429	478	304	280	208
10	143	127	219	420	380	1,060	486	393	507	448	157	119
11	140	137	140	336	390	819	433	388	263	338	354	165
12	138	127	156	338	380	624	408	468	348	344	119	195
13	143	109	160	263	275	599	390	2,060	375	272	91	175
14	132	159	149	323	384	548	414	12,000	284	244	162	180
15	141	225	155	258	569	503	420	12,800	330	237	173	135
16	140	239	142	272	308	452	3,120	7,030	328	213	176	234
17	150	201	149	240	294	402	9,000	4,150	251	211	171	186
18	123	145	201	344	284	430	3,110	2,260	299	197	163	214
19	119	152	168	444	192	353	2,000	1,660	316	194	194	187
20	133	146	149	1,020	277	717	1,550	1,340	316	208	143	143
21	147	149	145	1,080	261	803	1,780	1,190	248	146	152	148
22	140	150	148	1,130	261	664	2,680	1,350	261	218	142	155
23	127	168	502	1,690	237	555	1,740	1,280	259	168	151	227
24	133	166	3,400	1,290	218	525	1,330	1,210	266	189	152	98
25	267	302	12,700	1,010	222	509	1,110	2,370	212	178	156	153
26	274	346	4,960	1,450	232	404	982	4,150	265	186	190	189
27	181	229	1,730	1,460	225	475	872	2,490	252	163	116	154
28	140	231	1,190	1,060	242	428	792	1,610	263	172	317	322
29	204	228	955	770	-----	438	700	1,430	236	177	448	421
30	161	151	811	713	-----	397	597	1,300	254	164	97	920
31	233	-----	734	624	-----	409	-----	1,110	-----	182	44	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	274	113	153	0.244	0.28	9,410
November	346	74	179	.285	.32	10,700
December	12,700	140	990	1.58	1.82	60,900
January	1,690	240	687	1.10	1.27	42,200
February	613	192	353	.563	.59	19,600
March	1,490	228	538	.858	.99	33,100
April	9,000	302	1,280	2.04	2.28	76,200
May	12,800	367	2,200	3.51	4.05	135,000
June	912	212	394	.628	.70	23,400
July	448	146	223	.356	.41	13,700
August	975	44	248	.396	.46	15,200
September	920	52	203	.324	.36	12,100
The year	12,800	44	624	.995	13.53	452,000

BENNETT SPRING AT BRICE, MO.

LOCATION.—Staff gage in sec. 1, T. 34 N., R. 18 W., at Brice.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, about 2,030 second-feet May 13 (gage height, 2.52 feet); minimum, 75 second-feet Nov. 14, 15.

1929-33: Maximum gage height, 4.35 feet May 6, 1929 (discharge not determined); minimum, that of Nov. 14, 15, 1932.

Maximum stage known, about 7 feet during June 1928.

REMARKS.—Records good below and fair above 500 second-feet. Discharge interpolated for Dec. 25, 27. Occasional run-off from small valley above spring included in records.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	81	81	88	178	162	120	138	178	284	143	109	120
2.....	81	79	88	168	159	118	133	172	273	136	107	125
3.....	81	79	88	159	152	118	130	162	252	133	120	130
4.....	81	79	88	152	146	116	128	159	238	133	111	128
5.....	81	77	86	146	141	113	125	156	228	133	111	143
6.....	81	77	86	143	138	113	125	152	214	133	111	130
7.....	81	77	83	136	136	214	123	152	202	128	111	125
8.....	81	77	83	130	136	223	120	152	194	125	111	123
9.....	81	77	83	125	133	202	120	152	186	165	111	120
10.....	81	77	81	125	130	202	118	149	178	162	111	120
11.....	79	77	81	125	130	175	116	156	175	149	109	107
12.....	79	79	79	125	130	168	113	228	168	141	109	111
13.....	81	77	79	125	128	162	113	1,300	165	130	111	130
14.....	81	75	79	125	128	152	113	1,010	162	130	111	146
15.....	81	75	79	125	125	143	120	1,150	159	125	111	133
16.....	81	77	79	125	125	136	875	810	156	120	111	123
17.....	81	77	79	123	125	136	632	654	152	120	111	116
18.....	81	77	79	123	123	133	477	526	149	120	111	109
19.....	81	77	79	146	123	267	381	477	146	116	111	107
20.....	81	77	79	159	123	247	353	461	146	118	111	102
21.....	81	77	79	168	123	210	319	367	146	116	111	102
22.....	81	81	79	202	123	186	296	325	146	116	113	107
23.....	81	90	121	210	123	172	279	296	146	111	116	107
24.....	81	106	890	190	120	159	257	279	156	111	116	111
25.....	83	98	632	214	120	156	247	353	156	111	116	111
26.....	101	94	374	228	120	149	233	654	149	111	116	111
27.....	92	94	318	218	120	143	223	556	156	118	116	178
28.....	86	92	262	194	120	138	210	469	149	113	116	146
29.....	83	92	228	178	-----	133	194	403	149	120	116	165
30.....	83	90	206	168	-----	133	186	353	146	113	118	165
31.....	81	-----	194	162	-----	143	-----	313	-----	113	120	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	101	79	82.2	5,050
November.....	106	75	82.1	4,890
December.....	890	79	162	9,960
January.....	228	123	158	9,720
February.....	162	120	131	7,280
March.....	267	113	161	9,900
April.....	875	113	233	13,900
May.....	1,300	149	410	25,200
June.....	284	146	178	10,600
July.....	165	111	126	7,750
August.....	120	107	113	6,950
September.....	178	102	125	7,440
The year.....	1,300	75	164	119,000

GASCONADE RIVER BASIN

GASCONADE RIVER NEAR HAZLEGREEN, MO.

LOCATION.—Chain gage in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 15, T. 35 N., R. 14 W., at bridge on State highway 66, 1 mile below Osage Fork and 1½ miles west of Hazlegreen.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 43,100 second-feet May 15 (gage height, 25.75 feet); minimum, 42 second-feet Oct. 3 (gage height, 1.31 feet).

1929-33: Maximum, that of May 15, 1933; minimum, that of Oct. 3, 1932; minimum gage height, 1.31 feet Sept. 23, 24, 26, Oct. 3, 1932.

Maximum stage known, 31.8 feet in January 1916.

REMARKS.—Records good except those estimated, June 26, July 31, Aug. 1, 20, 21, and those for Feb. 9-12, when stage-discharge relation was affected by ice, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	194	241	1,520	920	822	640	855	985	223	150	82
2	44	610	228	1,380	822	670	700	920	855	198	136	84
3	42	460	215	1,180	730	610	700	790	760	168	198	150
4	82	374	207	985	670	550	640	730	700	150	146	150
5	65	319	198	855	610	490	580	700	640	136	352	153
6	56	278	190	730	550	490	550	670	580	126	268	150
7	54	246	182	670	550	2,090	520	822	550	116	215	150
8	52	250	178	610	490	6,840	490	760	490	259	198	146
9	50	241	175	550	450	4,000	490	1,120	431	855	182	139
10	48	268	171	520	400	2,490	460	920	374	550	168	130
11	56	299	168	490	390	1,800	431	790	374	363	198	113
12	56	299	186	460	380	1,450	402	855	341	259	175	146
13	52	278	153	431	374	1,180	374	9,640	314	198	153	160
14	52	246	153	402	374	1,050	368	27,200	294	160	146	223
15	58	241	175	374	431	920	2,740	30,700	273	146	136	288
16	52	232	190	374	352	760	15,000	21,500	254	139	126	374
17	56	215	182	358	352	670	15,800	10,200	241	133	113	368
18	56	207	190	374	341	985	5,650	4,500	232	139	101	250
19	56	198	133	460	341	985	3,600	2,920	215	139	96	207
20	52	190	133	1,310	336	1,180	2,570	2,090	207	146	96	164
21	52	190	130	2,090	330	1,240	2,740	2,250	198	146	96	153
22	52	190	139	2,570	319	1,050	3,200	2,650	186	143	96	139
23	52	402	198	4,400	309	855	2,490	1,730	168	139	90	130
24	50	363	5,100	2,650	304	760	1,940	1,520	160	133	84	116
25	93	330	12,100	2,570	309	670	1,660	3,700	153	126	79	104
26	175	330	6,840	3,200	299	610	1,450	5,760	145	120	74	96
27	171	309	2,920	2,570	920	580	1,240	4,300	341	223	70	164
28	223	288	2,010	1,940	920	550	1,120	2,490	259	250	82	460
29	215	278	1,590	1,520	-----	520	920	1,800	610	207	104	920
30	194	250	1,310	1,240	-----	520	855	1,450	294	178	90	700
31	190	-----	1,240	1,050	-----	520	-----	1,180	-----	164	84	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	223	42	82.5	0.066	0.08	5,070
November	610	190	286	.229	.26	17,000
December	12,100	130	1,200	.960	1.11	73,800
January	4,400	358	1,280	1.02	1.18	78,700
February	920	299	485	.388	.40	26,900
March	6,840	490	1,220	.976	1.13	75,000
April	15,800	368	2,340	1.87	2.09	139,000
May	30,700	670	4,760	3.81	4.39	293,000
June	985	145	387	.310	.35	23,000
July	855	116	207	.166	.19	12,700
August	352	70	139	.111	.13	8,550
September	920	82	220	.176	.20	13,100
The year	30,700	42	1,060	.848	11.51	766,000

GASCONADE RIVER NEAR WAYNESVILLE, MO.

LOCATION.—Chain gage in SE¼ sec. 3, T. 36 N., R. 12 W., at bridge on State highway 17, 4 miles north of Waynesville. Zero of gage is 739.40 feet above mean sea level.

DRAINAGE AREA.—1,680 square miles.

RECORDS AVAILABLE.—June 1921 to September 1933.

DISCHARGE.—Maximum during year, 52,200 second-feet May 15 (gage height, 19.95 feet); minimum, 76 second-feet Oct. 14, 20, 21 (gage height, 1.96 feet).

1921–33: Maximum, that of May 15, 1933; minimum, 75 second-feet Sept.

23–25, 1932. Average, 12 years (1921–33), 1,450 second-feet.

Maximum stage known, 24.3 feet Aug. 22, 1915.

REMARKS.—Records good. Discharge interpolated Jan. 2.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	263	344	1,480	1,300	982	738	1,140	1,560	415	203	133
2	85	289	344	1,520	1,110	837	872	1,140	1,300	344	203	142
3	81	566	344	1,560	1,020	770	908	1,140	1,140	344	211	156
4	146	566	321	1,390	908	707	908	1,060	1,060	241	196	181
5	116	488	298	1,220	837	648	872	982	945	224	184	211
6	105	439	298	1,020	770	620	804	982	837	220	298	211
7	105	368	272	945	648	1,300	738	1,020	804	220	298	215
8	100	344	263	837	620	4,740	738	1,140	707	439	280	211
9	95	344	254	770	539	7,680	678	1,140	648	237	272	196
10	95	321	258	707	514	3,940	648	945	592	738	228	184
11	88	321	263	620	439	2,620	648	1,140	539	592	241	184
12	90	344	245	592	488	2,030	592	1,140	514	415	294	184
13	83	368	237	566	488	1,740	566	6,260	488	344	368	188
14	81	344	228	514	439	1,560	539	24,600	464	280	321	207
15	95	344	215	488	488	1,300	1,560	39,500	439	285	321	298
16	85	321	181	464	415	1,140	14,800	28,900	415	200	250	285
17	85	298	173	439	415	1,060	18,600	21,400	391	192	211	321
18	88	298	203	439	415	1,140	11,100	9,540	368	215	184	391
19	81	289	196	592	415	2,030	5,920	6,260	368	188	188	321
20	76	280	196	648	391	1,480	3,940	3,480	344	181	173	254
21	76	280	192	1,840	391	1,650	3,330	2,890	321	173	156	237
22	83	276	188	2,370	391	1,480	3,940	3,180	298	192	153	207
23	90	391	298	3,940	368	1,300	3,630	2,620	285	203	142	173
24	85	566	3,330	4,260	368	1,060	2,750	2,250	272	177	149	177
25	116	488	9,160	3,030	368	1,020	2,250	4,260	280	159	133	149
26	153	488	13,600	3,180	344	908	2,030	9,350	276	149	133	166
27	159	464	5,240	2,140	391	837	1,740	9,540	258	136	133	153
28	166	439	2,890	2,620	982	804	1,480	3,940	368	130	116	192
29	232	415	2,140	2,030	-----	738	1,390	4,420	321	289	133	391
30	211	391	1,740	1,740	-----	738	1,220	2,250	488	258	139	592
31	276	-----	1,560	1,480	-----	738	-----	1,840	-----	232	153	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	276	76	113	0.067	0.08	6,950
November	566	263	380	.226	.25	22,600
December	13,600	173	1,470	.875	1.01	90,400
January	4,260	439	1,470	.875	1.01	90,400
February	1,300	344	582	.346	.36	32,300
March	7,680	620	1,600	.952	1.10	98,400
April	18,600	539	3,000	1.79	2.00	179,000
May	39,500	945	6,430	3.83	4.42	395,000
June	1,560	258	570	.339	.38	33,900
July	738	130	271	.161	.19	16,700
August	368	116	209	.124	.14	12,900
September	592	133	230	.137	.15	13,700
The year	39,500	76	1,370	.815	11.09	992,000

GASCONADE RIVER AT JEROME, MO.

LOCATION.—Staff gage in S½ sec. 13, T. 37 N., R. 10 W., at Jerome, half a mile below Little Piney Creek. Zero of gage is 658.12 feet above mean sea level.

DRAINAGE AREA.—2,840 square miles.

RECORDS AVAILABLE.—January 1923 to September 1933; April 1903 to July 1906 at Arlington, Mo.

DISCHARGE.—Maximum during year, 62,600 second-feet May 16 (gage height, 23.40 feet); minimum, 350 second-feet Oct. 1-3, 20-24 (gage height, 1.40 feet).

1903-6, 1923-33: Maximum, that of May 16, 1933; minimum, 338 second-feet Sept. 24, 25, 1932 (gage height, 1.38 feet). Average, 10 years (1923-33), 2,640 second-feet.

Maximum stage known, 29.0 feet (revised) Jan. 6, 1897.

REMARKS.—Records good.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	350	1,470	740	3,980	2,300	1,820	1,580	2,420	3,170	930	615	488
2	350	1,470	740	3,040	2,060	1,700	1,700	2,910	2,780	830	567	575
3	350	1,030	698	3,040	1,820	1,470	1,820	2,540	2,420	785	575	551
4	655	1,200	698	2,540	1,700	1,360	1,820	2,300	2,300	698	575	543
5	495	1,080	655	2,180	1,580	1,200	1,700	2,180	2,060	655	575	1,140
6	428	930	655	1,940	1,420	1,300	1,580	2,060	1,940	655	575	785
7	413	880	615	1,820	1,360	2,660	1,580	2,060	1,820	615	655	655
8	399	830	615	1,580	1,250	6,490	1,580	2,180	1,700	615	655	655
9	378	785	575	1,470	1,140	9,600	1,470	2,540	1,580	1,030	615	615
10	378	740	615	1,360	1,140	6,850	1,420	2,540	1,470	830	575	575
11	378	740	615	1,250	1,080	4,690	1,360	2,540	1,360	1,300	615	615
12	378	698	615	1,140	1,030	3,700	1,250	2,420	1,300	1,030	1,940	559
13	371	740	559	1,080	980	3,040	1,200	13,000	1,250	830	1,200	615
14	371	740	575	1,030	930	2,660	1,140	34,200	1,140	740	830	615
15	364	785	543	980	880	2,420	3,170	52,900	1,080	698	698	615
16	364	740	364	930	930	2,180	18,300	60,300	1,030	655	655	615
17	364	698	420	880	880	1,940	27,900	32,600	1,030	615	615	655
18	364	698	435	930	830	1,940	22,200	21,700	980	740	575	698
19	364	655	543	1,250	830	2,420	11,900	9,400	930	655	551	655
20	357	655	527	1,820	830	2,540	7,420	6,850	880	615	535	655
21	350	655	527	2,180	785	2,420	5,620	5,960	880	615	511	575
22	350	655	511	4,260	785	2,420	5,620	5,460	880	615	495	559
23	350	1,030	575	6,310	785	2,180	5,960	4,990	830	575	488	535
24	350	1,030	4,260	6,850	740	1,940	4,990	4,690	785	575	472	519
25	488	1,140	11,300	5,620	785	1,820	4,260	6,130	785	698	472	495
26	655	980	13,100	4,990	785	1,700	3,560	13,400	740	785	458	480
27	575	880	11,800	5,140	1,300	1,580	3,170	12,500	740	655	442	527
28	575	880	5,100	4,400	1,300	1,470	2,780	8,400	930	575	465	980
29	615	830	3,700	3,560	-----	1,360	2,540	5,790	880	575	503	880
30	615	785	3,040	2,910	-----	1,470	2,420	4,540	830	655	488	830
31	698	-----	2,780	2,540	-----	1,470	-----	3,700	-----	615	472	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	698	350	435	0.153	0.18	26,700
November	1,470	655	881	.310	.35	52,400
December	13,100	364	2,210	.778	.90	136,000
January	6,850	880	2,680	.944	1.09	165,000
February	2,300	740	1,150	.405	.42	63,900
March	9,600	1,200	2,640	.930	1.07	162,000
April	27,900	1,140	5,100	1.80	2.01	303,000
May	60,300	2,060	10,800	3.80	4.38	664,000
June	3,170	740	1,350	.475	.53	80,300
July	1,300	575	724	.255	.29	44,500
August	1,940	442	628	.221	.25	38,600
September	1,140	480	642	.226	.25	38,200
The year	60,300	350	2,450	.863	11.72	1,770,000

GASCONADE RIVER NEAR RICH FOUNTAIN, MO.

LOCATION.—Chain gage in SE¼ sec. 16, T. 42 N., R. 8 W., at highway bridge just above Swan Creek and 4 miles east of Rich Fountain. Zero of gage is 554.24 feet above mean sea level.

DRAINAGE AREA.—3,180 square miles.

RECORDS AVAILABLE.—October 1921 to September 1933.

DISCHARGE.—Maximum during year, 60,600 second-feet May 17 (gage height, 24.05 feet); minimum, 404 second-feet Oct. 1, 21–24; minimum gage height, 1.01 feet Oct. 1, 22–24.

1921–33: Maximum, that of May 17, 1933; minimum, that of Oct. 1, 21–24, 1932; minimum gage height, 0.99 foot Sept. 25, 1932. Average, 12 years, 2,940 second-feet.

REMARKS.—Records fair except those estimated, which are poor. Stage-discharge relation affected by ice Feb. 7–12.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul ⁷	Aug.	Sept.
1	404	761	865	3,000	2,760	1,310	2,200	2,640	4,310	960	636	490
2	604	865	829	3,960	2,530	1,770	2,200	2,640	3,660	960	599	599
3	634	1,490	829	3,480	2,310	1,580	2,090	3,480	3,270	791	599	712
4	761	1,220	795	3,120	1,980	1,490	2,200	2,760	2,770	712	599	674
5	795	1,310	761	2,760	1,770	1,490	2,200	2,530	2,660	674	599	791
6	696	1,220	761	2,420	1,680	2,530	2,090	2,420	2,310	674	599	1,410
7	544	901	728	2,090	1,600	4,630	1,980	3,360	2,210	636	599	874
8	514	901	696	1,870	1,500	4,350	1,870	3,120	2,100	636	636	752
9	486	938	696	1,680	1,400	7,670	1,870	2,310	1,790	874	674	674
10	486	865	665	1,580	1,300	8,830	1,770	2,420	1,700	1,050	636	636
11	458	829	696	1,400	1,230	5,650	1,680	3,000	1,600	874	712	599
12	458	795	665	1,310	1,140	4,490	1,580	5,500	1,510	1,230	712	599
13	431	795	634	1,220	1,050	3,840	1,490	12,100	1,410	1,050	1,890	599
14	431	795	604	1,130	1,050	3,000	1,400	24,300	1,410	917	1,100	636
15	431	865	665	1,050	975	2,420	1,770	35,000	1,320	791	917	674
16	431	865	573	1,050	938	2,360	10,300	50,300	1,230	712	791	674
17	431	865	634	975	938	2,310	21,300	59,800	1,140	674	752	674
18	431	829	696	1,050	901	3,360	27,400	36,800	1,140	712	674	712
19	431	829	761	1,980	865	3,360	24,000	20,800	1,050	917	636	712
20	431	795	829	1,870	829	2,880	10,600	8,280	960	917	674	712
21	404	865	728	2,640	829	2,760	7,350	10,100	960	636	599	636
22	404	865	604	4,490	829	2,640	6,250	7,100	917	636	562	599
23	404	829	1,980	5,650	795	2,880	6,400	6,310	874	636	526	1,050
24	404	1,310	5,050	6,510	795	2,760	6,100	5,500	832	674	490	960
25	544	1,310	7,670	8,150	829	2,640	5,200	8,640	791	569	490	712
26	901	1,220	13,900	6,710	829	2,090	4,490	10,400	791	750	483	917
27	901	1,130	12,800	5,950	829	1,870	3,960	15,300	791	820	476	1,700
28	761	1,050	5,800	5,500	1,050	1,680	3,480	12,100	791	674	476	917
29	696	975	4,910	4,490	-----	1,490	3,120	8,280	917	636	476	874
30	728	901	4,220	3,600	-----	1,680	2,760	6,160	960	569	526	1,050
31	761	-----	3,500	3,240	-----	2,090	-----	5,010	-----	636	526	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	901	404	555	0.175	0.20	34,100
November	1,490	761	973	.306	.34	57,900
December	13,900	573	2,440	.767	.88	150,000
January	8,150	975	3,130	.984	1.13	192,000
February	2,760	795	1,270	.399	.42	70,500
March	8,830	1,310	3,030	.953	1.10	186,000
April	27,400	1,400	5,700	1.79	2.00	339,000
May	59,800	2,310	12,200	3.84	4.43	750,000
June	4,310	791	1,610	.506	.56	95,800
July	1,230	599	776	.244	.28	47,700
August	1,890	476	667	.210	.24	41,000
September	1,700	490	787	.247	.28	46,800
The year	59,800	404	2,780	.874	11.86	2,010,000

• Estimated.

PINEY CREEK NEAR BIG PINEY, MO.

LOCATION.—Chain gage in NE¼ sec. 8, T. 34 N., R. 10 W., at Ross highway bridge 3 miles east of Big Piney.

DRAINAGE AREA.—560 square miles.

RECORDS AVAILABLE.—October 1921 to September 1933.

DISCHARGE.—Maximum during year, 16,500 second-feet May 14 (gage height, 17.20 feet); minimum, 100 second-feet Oct. 2, 3, 6–9, 14–20, 23, 24; minimum gage height, 1.72 feet Oct. 2, 3.

1921–33: Maximum, that of May 14, 1933; minimum, 76 second-feet July 30, 31, 1926 (gage height, 1.60 feet). Average, 12 years, 560 second-feet.

REMARKS.—Records good. Discharge interpolated July 4 and for a period of ice effect Dec. 16, 17.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	104	1,400	138	1,240	364	435	600	750	630	186	143	133
2.....	100	570	138	950	324	364	541	880	600	180	143	148
3.....	100	410	138	660	305	324	435	750	512	180	143	153
4.....	115	286	205	512	286	324	410	630	460	183	186	750
5.....	104	251	199	512	268	268	387	570	410	186	180	305
6.....	100	234	129	364	251	541	364	630	387	164	158	218
7.....	100	199	129	364	251	880	435	600	344	158	148	192
8.....	100	205	129	324	251	2,330	435	1,090	324	153	138	169
9.....	100	192	124	324	164	1,240	387	950	305	175	175	158
10.....	104	192	138	268	164	880	364	750	286	175	158	153
11.....	104	175	133	268	153	720	324	600	286	164	3,000	148
12.....	104	180	133	251	180	600	305	541	286	164	541	180
13.....	102	169	129	234	192	512	268	5,980	268	158	251	175
14.....	100	169	129	212	192	486	268	14,500	251	148	205	169
15.....	100	169	133	205	180	175	4,000	7,640	251	148	175	153
16.....	100	158	129	199	180	364	10,800	7,300	251	148	164	143
17.....	100	153	124	192	180	344	4,000	2,800	234	143	164	138
18.....	100	153	120	192	169	324	2,240	1,880	234	153	153	133
19.....	100	153	129	512	180	324	1,480	1,480	218	158	143	133
20.....	100	153	129	1,020	175	460	1,240	1,160	218	148	143	133
21.....	104	148	124	1,240	175	410	1,090	1,160	212	143	143	133
22.....	104	148	124	3,000	169	410	1,400	1,020	212	143	138	129
23.....	100	153	124	1,880	169	410	1,160	810	199	143	138	129
24.....	100	153	286	1,160	164	410	950	750	199	143	133	124
25.....	153	164	5,320	1,020	180	410	880	1,480	186	435	129	124
26.....	192	158	1,560	880	810	410	720	4,440	192	218	129	153
27.....	199	158	950	720	630	410	690	2,330	435	186	153	153
28.....	164	148	750	630	512	410	600	1,320	251	158	153	460
29.....	138	143	600	460	-----	387	570	1,090	218	164	143	251
30.....	153	143	512	435	-----	324	570	880	199	158	133	212
31.....	153	-----	1,240	410	-----	324	-----	750	-----	205	133	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	199	100	116	0.207	0.24	7,130
November.....	1,400	143	236	.421	.47	14,000
December.....	5,320	120	463	.827	.95	28,500
January.....	3,000	192	666	1.19	1.37	41,000
February.....	810	153	258	.461	.48	14,300
March.....	2,330	268	531	.948	1.09	32,600
April.....	10,800	268	1,260	2.25	2.51	75,000
May.....	14,500	541	2,180	3.89	4.48	134,000
June.....	630	186	302	.539	.60	18,000
July.....	435	143	173	.309	.36	10,600
August.....	3,000	129	259	.462	.53	15,900
September.....	750	124	192	.343	.38	11,400
The year.....	14,500	100	556	.993	13.46	402,000

LITTLE PINEY CREEK AT NEWBURG, MO.

LOCATION.—Chain gage in SE¼ sec. 22, T. 37 N., R. 9 W., at highway bridge in Newburg. Zero of gage is 696.99 feet above mean sea level.

DRAINAGE AREA.—200 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,840 second-feet May 13 (gage height, 7.58 feet); minimum, 27 second-feet Oct. 1; minimum gage height, 0.90 foot Sept. 22.

1928-33: Maximum, 8,860 second-feet May 6, 1929; maximum gage height, that of May 13, 1933; minimum, that of Oct. 1, 1932; minimum gage height, 0.89 foot June 8, 1932.

Maximum stage known, 13.7 feet Aug. 20, 1915.

REMARKS.—Records good. Discharge interpolated Dec. 6 and when stage-discharge relation was affected by ice Feb. 8.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	27	62	56	122	108	47	93	122	157	53	44	36
2.....	28	58	55	117	100	47	84	275	144	55	43	53
3.....	29	51	53	111	90	47	72	134	134	55	48	46
4.....	34	48	53	95	86	48	70	125	127	52	45	51
5.....	30	53	51	86	74	47	67	122	117	49	42	42
6.....	29	47	51	84	79	61	72	106	117	50	42	40
7.....	29	46	51	84	74	600	69	100	111	50	41	37
8.....	30	55	48	74	60	325	66	98	106	49	41	34
9.....	30	53	46	72	46	226	64	93	99	53	42	34
10.....	36	51	56	70	46	178	64	95	93	55	42	32
11.....	33	51	56	69	43	150	59	95	86	51	48	32
12.....	33	50	50	66	56	122	55	167	90	49	42	33
13.....	32	48	53	59	56	122	52	7,080	90	48	42	34
14.....	31	47	51	56	55	114	59	2,140	82	48	42	36
15.....	31	41	46	56	51	98	1,470	3,380	80	50	41	34
16.....	31	41	41	55	53	90	1,360	1,030	77	47	40	35
17.....	34	39	41	52	53	84	670	641	77	47	39	33
18.....	35	41	56	69	51	81	446	482	74	47	40	33
19.....	41	46	53	122	51	95	342	396	74	69	40	33
20.....	39	46	52	103	53	93	280	342	69	59	39	33
21.....	39	47	59	138	51	79	222	342	66	55	39	32
22.....	41	47	59	280	47	74	189	342	63	52	39	29
23.....	41	255	72	205	48	72	157	261	62	50	37	32
24.....	41	100	1,200	175	47	66	147	238	65	50	38	32
25.....	56	81	280	348	53	72	141	290	65	51	32	32
26.....	79	66	201	240	47	64	128	824	62	50	32	33
27.....	50	62	147	193	46	61	111	369	63	49	32	37
28.....	41	56	117	153	48	62	108	311	60	49	35	35
29.....	46	53	103	134	-----	59	108	266	58	48	40	40
30.....	47	58	93	125	-----	86	141	217	56	46	38	40
31.....	77	-----	153	114	-----	79	-----	180	-----	46	40	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	79	27	38.7	0.194	0.22	2,380
November.....	255	39	60.0	.300	.33	3,570
December.....	1,200	41	113	.565	.65	6,950
January.....	348	52	120	.600	.69	7,380
February.....	108	43	59.7	.298	.31	3,320
March.....	600	47	111	.555	.64	6,820
April.....	1,470	52	232	1.16	1.29	13,800
May.....	7,080	93	667	3.34	3.85	41,000
June.....	157	56	87.5	.438	.49	5,210
July.....	69	46	51.0	.255	.29	3,140
August.....	48	32	40.2	.201	.23	2,470
September.....	53	29	36.1	.180	.20	2,150
The year.....	7,080	27	136	.680	9.19	98,200

MISCELLANEOUS DISCHARGE MEASUREMENTS

In addition to the records of stream flow obtained at gaging stations and reported in the preceding pages, measurements of flow were made at a number of other points as shown by the following table:

Miscellaneous discharge measurements in Missouri River drainage basin during the year ending Sept. 30, 1933

Date	Stream	Tributary to—	Locality	Dis-charge
Oct. 17	Bazille Creek.....	Missouri River.....	Sec. 33, T. 32 N., R. 5 W., near Niobrara, Nebr.	Sec.-ft. 31.9
Jan. 9	do.....	do.....	do.....	46.4
Feb. 22	do.....	do.....	do.....	46.7
Apr. 16	do.....	do.....	do.....	38.4
May 19	do.....	do.....	do.....	37.1
June 13	do.....	do.....	do.....	21.6
July 28	do.....	do.....	do.....	21.8
Aug. 31	do.....	do.....	do.....	32.5
Sept. 25	do.....	do.....	do.....	25.9
Oct. 29	Little Papillion Creek	do.....	Sec. 1, T. 14 N., R. 12 E., near Omaha, Nebr.	5.3
Nov. 18	do.....	do.....	do.....	7.6
Jan. 16	do.....	do.....	do.....	6.8
Feb. 17	do.....	do.....	do.....	6.6
Apr. 12	do.....	do.....	do.....	9.8
May 31	do.....	do.....	do.....	4.4
June 14	do.....	do.....	do.....	4.1
July 25	do.....	do.....	do.....	3.3
Aug. 28	do.....	do.....	do.....	3.8
Oct. 19	Middle Loup River..	Loup River.....	Sec. 1, T. 19 N., R. 20 W., near Sargent, Nebr.	975
Jan. 11	do.....	do.....	do.....	921
Feb. 24	do.....	do.....	do.....	1,250
Apr. 18	do.....	do.....	do.....	796
May 19	do.....	do.....	do.....	853
June 4	do.....	do.....	do.....	756
July 31	do.....	do.....	do.....	721
Aug. 31	do.....	do.....	do.....	904
Oct. 19	Dismal River.....	Middle Loup River..	Sec. 4, T. 21 N., R. 24 W., near Dunning, Nebr.	357
Jan. 11	do.....	do.....	do.....	336
Feb. 24	do.....	do.....	do.....	349
Apr. 18	do.....	do.....	do.....	323
May 19	do.....	do.....	do.....	325
July 31	do.....	do.....	do.....	290
Sept. 1	do.....	do.....	do.....	391
Oct. 20	Mud Creek.....	Loup River.....	Sec. 22, T. 13 N., R. 15 W., near Hazard, Nebr.	16.4
Jan. 12	do.....	do.....	do.....	23.3
Feb. 24	do.....	do.....	do.....	33.9
Apr. 18	do.....	do.....	do.....	23.8
May 18	do.....	do.....	do.....	29.2
June 4	do.....	do.....	do.....	24.7
July 31	do.....	do.....	do.....	18.2
Sept. 1	do.....	do.....	do.....	13.5
Oct. 20	North Loup River...	do.....	Sec. 23, T. 21 N., R. 18 W., at Taylor, Nebr.	489
Jan. 10	do.....	do.....	do.....	676
Feb. 23	do.....	do.....	do.....	891
Apr. 17	do.....	do.....	do.....	396
May 19	do.....	do.....	do.....	490
June 5	do.....	do.....	do.....	434
July 29	do.....	do.....	do.....	362
Aug. 31	do.....	do.....	do.....	450
Oct. 20	Calamus River.....	North Loup River...	Sec. 24, T. 23 N., R. 18 W., near Harrop, Nebr.	195
Jan. 10	do.....	do.....	do.....	218
Feb. 23	do.....	do.....	do.....	231
Apr. 17	do.....	do.....	do.....	198
May 19	do.....	do.....	do.....	224
July 29	do.....	do.....	do.....	169
Aug. 31	do.....	do.....	do.....	176
Oct. 24	Cedar River.....	Loup River.....	Sec. 32, T. 17 N., R. 6 W., near Fullerton, Nebr.	278
Jan. 6	do.....	do.....	do.....	221
Feb. 19	do.....	do.....	do.....	234
Apr. 14	do.....	do.....	do.....	200
May 16	do.....	do.....	do.....	307
June 6	do.....	do.....	do.....	168
July 27	do.....	do.....	do.....	191
Aug. 30	do.....	do.....	do.....	142

Miscellaneous discharge measurements in Missouri River drainage basin during the year ending Sept. 30, 1933—Continued

Date	Stream	Tributary to—	Locality	Dis-charge Sec.-ft.
Oct. 24	Timber Creek.....	Cedar River.....	Sec. 17, T. 17 N., R. 7 W., near Belgrade, Nebr.	13.7
Jan. 6	do.....	do.....	do.....	5.4
Feb. 19	do.....	do.....	do.....	4.5
Apr. 14	do.....	do.....	do.....	4.2
May 16	do.....	do.....	do.....	4.7
June 6	do.....	do.....	do.....	2.3
July 27	do.....	do.....	do.....	1.2
Aug. 30	do.....	do.....	do.....	1.5
Oct. 24	Beaver Creek.....	Loup River.....	Sec. 15, T. 20 N., R. 6 W., at Albion, Nebr.	81
Jan. 7	do.....	do.....	do.....	63
Feb. 21	do.....	do.....	do.....	69
Apr. 15	do.....	do.....	do.....	57
May 16	do.....	do.....	do.....	100
June 13	do.....	do.....	do.....	39.2
July 28	do.....	do.....	do.....	38.5
Aug. 30	do.....	do.....	do.....	40.4
Oct. 18	Elkhorn River.....	Platte River.....	Sec. 31, T. 29 N., R. 11 W., at O'Neill, Nebr.	27.4
Jan. 10	do.....	do.....	do.....	39.0
Feb. 23	do.....	do.....	do.....	38.9
Apr. 17	do.....	do.....	do.....	40.0
May 19	do.....	do.....	do.....	69
June 13	do.....	do.....	do.....	30.9
July 29	do.....	do.....	do.....	14.1
Aug. 30	do.....	do.....	do.....	22.5
Sept. 29	do.....	do.....	do.....	20.7
Oct. 28	Upper Clear Creek.....	Wahoo Creek.....	Sec. 36, T. 13 N., R. 9 E., near Ashland, Nebr.	8.7
Nov. 18	do.....	do.....	do.....	7.6
Apr. 12	do.....	do.....	do.....	9.3
June 15	do.....	do.....	do.....	19.4
July 24	do.....	do.....	do.....	22.4
Aug. 28	do.....	do.....	do.....	4.3
Sept. 21	do.....	do.....	do.....	5.6
Oct. 28	Oak Creek.....	Salt Creek.....	Sec. 15, T. 10 N., R. 6 E., near Lincoln, Nebr.	8.2
Jan. 18	do.....	do.....	do.....	11.6
Feb. 16	do.....	do.....	do.....	5.0
Apr. 12	do.....	do.....	do.....	11.9
May 31	do.....	do.....	do.....	4.8
June 7	do.....	do.....	do.....	3.6
July 24	do.....	do.....	do.....	7.8
Aug. 28	do.....	do.....	do.....	10.1
Sept. 29	do.....	do.....	do.....	5.7
Jan. 23	Republican River.....	Kansas River.....	Sec. 22, T. 4 N., R. 24 W., at Folbrook, Nebr.	424
Feb. 9	do.....	do.....	do.....	63
Mar. 5	do.....	do.....	do.....	451
Apr. 8	do.....	do.....	do.....	334
June 2	do.....	do.....	do.....	158
July 9	do.....	do.....	do.....	78
July 19	do.....	do.....	do.....	5.9
Aug. 22	do.....	do.....	do.....	2,720
Nov. 15	do.....	do.....	Sec. 7, T. 3 N., R. 20 W., at Oxford, Nebr.	188
Jan. 22	do.....	do.....	do.....	386
Feb. 10	do.....	do.....	do.....	95
Mar. 5	do.....	do.....	do.....	628
Apr. 9	do.....	do.....	do.....	334
June 2	do.....	do.....	do.....	199
July 9	do.....	do.....	do.....	116
July 19	do.....	do.....	do.....	34.6
Aug. 24	do.....	do.....	do.....	687
Mar. 10	Medicine Creek.....	Republican River.....	Sec. 18, T. 4 N., R. 25 W., near Cambridge, Nebr.	39.5
Apr. 7	do.....	do.....	do.....	58
June 3	do.....	do.....	do.....	36.2
July 9	do.....	do.....	do.....	54
July 19	do.....	do.....	do.....	20.1
Aug. 22	do.....	do.....	do.....	572
Nov. 15	Deer Creek.....	do.....	Sec. 23, T. 4 N., R. 24 W., at Holbrook, Nebr.	0
Mar. 10	do.....	do.....	do.....	0
Apr. 7	do.....	do.....	do.....	0.1
June 2	do.....	do.....	do.....	0
July 9	do.....	do.....	do.....	0.2
July 19	do.....	do.....	do.....	36.5
Aug. 23	do.....	do.....	do.....	

Miscellaneous discharge measurements in Missouri River drainage basin during the year ending Sept. 30, 1933—Continued

Date	Stream	Tributary to—	Locality	Dis-charge
				<i>Sec.-ft.</i>
Mar. 10	Muddy Creek.....	Republican River....	Sec. 16, T. 4 N., R. 23 W., at Arapahoe, Nebr.	2.1
Apr. 8	do.....	do.....	do.....	4.8
June 2	do.....	do.....	do.....	1.5
June 9	do.....	do.....	do.....	5.4
July 19	do.....	do.....	do.....	2.3
Aug. 23	do.....	do.....	do.....	90
Nov. 15	Turkey Creek.....	do.....	Sec. 31, T. 4 N., R. 21 W., at Oxford, Nebr.	2.3
Mar. 10	do.....	do.....	do.....	1.1
Apr. 8	do.....	do.....	do.....	2.7
June 2	do.....	do.....	do.....	.5
June 9	do.....	do.....	do.....	1.4
July 19	do.....	do.....	do.....	.2
Aug. 21	do.....	do.....	do.....	34.7
Mar. 10	Beaver Creek.....	do.....	Sec. 17, T. 1 N., R. 26 W., at Lebanon, Nebr.	.2
Apr. 7	do.....	do.....	do.....	1.6
June 3	do.....	do.....	do.....	1.2
June 9	do.....	do.....	do.....	2.3
July 19	do.....	do.....	do.....	62
Aug. 23	do.....	do.....	do.....	248
Nov. 15	do.....	do.....	Sec. 19, T. 2 N., R. 23 W., near Beaver City, Nebr.	0
Mar. 10	do.....	do.....	do.....	.5
Apr. 8	do.....	do.....	do.....	1.4
June 2	do.....	do.....	do.....	8.2
June 9	do.....	do.....	do.....	6.1
Aug. 23	do.....	do.....	do.....	90
Nov. 15	do.....	do.....	Sec. 10, T. 2 N., R. 21 W., near Hollinger, Nebr.	0
Mar. 10	do.....	do.....	do.....	0
Apr. 8	do.....	do.....	do.....	0
June 2	do.....	do.....	do.....	9.2
June 9	do.....	do.....	do.....	6.9
Aug. 23	do.....	do.....	do.....	14.0
Nov. 16	Flag Creek.....	do.....	Sec. 16, T. 2 N., R. 19 W., at Orleans, Nebr.	.7
Mar. 10	do.....	do.....	do.....	1
Apr. 10	do.....	do.....	do.....	.9
June 2	do.....	do.....	do.....	1
June 9	do.....	do.....	do.....	.9
Aug. 24	do.....	do.....	do.....	.6
Nov. 16	Big Cottonwood Creek.....	do.....	Sec. 6, T. 1 N., R. 15 W., near Bloomington, Nebr.	3.6
Mar. 10	do.....	do.....	do.....	1.4
Apr. 10	do.....	do.....	do.....	4.8
June 2	do.....	do.....	do.....	2
June 9	do.....	do.....	do.....	3.7
Aug. 24	do.....	do.....	do.....	3.6
Nov. 16	Farmers Creek.....	do.....	Sec. 5, T. 1 N., R. 12 W., near Riverton, Nebr.	.6
Mar. 10	do.....	do.....	do.....	4.6
Apr. 10	do.....	do.....	do.....	2.1
June 1	do.....	do.....	do.....	.5
June 9	do.....	do.....	do.....	.4
Aug. 24	do.....	do.....	do.....	0
Nov. 16	Indian Creek.....	do.....	Sec. 4, T. 1 N., R. 11 W., near Red Cloud, Nebr.	0
Mar. 10	do.....	do.....	do.....	1.6
Apr. 10	do.....	do.....	do.....	.5
June 1	do.....	do.....	do.....	.1
June 9	do.....	do.....	do.....	0
Aug. 24	do.....	do.....	do.....	0
Aug. 7	Smoky Hill River.....	Kansas River.....	Jerome, Kans.	4,460
8	do.....	do.....	Hays, Kans.	4,640
9	do.....	do.....	Pfeifer, Kans.	2,580
9	do.....	do.....	Russell, Kans.	3,560
10	do.....	do.....	Ellsworth, Kans.	2,800
Oct. 26	Little Blue River.....	Big Blue River.....	Sec. 20, T. 3 N., R. 4 W., near Deshler, Nebr.	52
Nov. 17	do.....	do.....	do.....	90
Jan. 21	do.....	do.....	do.....	61
Feb. 11	do.....	do.....	do.....	65
Apr. 10	do.....	do.....	do.....	63
June 1	do.....	do.....	do.....	109
Aug. 25	do.....	do.....	do.....	204

Miscellaneous discharge measurements in Missouri River drainage basin during the year ending Sept. 30, 1933—Continued

Date	Stream	Tributary to—	Locality	Dis-charge
Sept. 17	Osage River.....	Missouri River.....	On line between secs. 20 and 2'. T. 38 N., R. 29 W., 2½ miles north of Schell City, Mo.	Sec.-ft. 20
Oct. 6	do.....	do.....	do.....	19
Dec. 27	do.....	do.....	do.....	5,370
28	do.....	do.....	do.....	2,720
Apr. 4	do.....	do.....	do.....	333
May 16	do.....	do.....	do.....	16,700
17	do.....	do.....	do.....	13,500
19	do.....	do.....	do.....	8,220
20	do.....	do.....	do.....	7,580
Oct. 19	Chesapeake Spring.....	Goose Creek.....	SW¼ sec. 21, T. 28 N., R. 25 W., at Chesapeake, Mo.	1.6
19	Lumbec Mill Spring.....	Turnback Creek.....	NW¼ sec. 12, T. 29 N., R. 26 W., 7 miles northwest of Halletown, Mo.	3.7
14	Boylers Mill Spring.....	Buffalo Creek.....	Sec. 7, T. 41 N., R. 19 W., 9 miles south of Stover, Mo.	1.1
Sept. 2	Famous Blue Spring.....	Niangua River.....	NW¼ sec. 36, T. 35 N., R. 18 W., 1 mile west of Brice, Mo.	4.4
Oct. 20	Blue Spring.....	do.....	Sec. 30, T. 36 N., R. 17 W., 6 miles west of Eldridge, Mo.	11.0
21	Hahatonka Spring.....	do.....	Sec. 2, T. 37 N., R. 17 W., at Hahatonka, Mo.	40
15	Gravois Mill Spring.....	Gravois Creek.....	Sec. 19, T. 41 N., R. 17 W., 1 mile west of Gravois Mills, Mo.	5.4
21	Gasconade River.....	Missouri River.....	Sec. 33, T. 37 N., R. 10 W., above Boiling Spring, 4 miles northeast of Hooker, Mo.	256
12	Falling Spring.....	Gasconade River.....	On line between secs. 17 and 20, T. 36 N., R. 12 W., 5 miles northwest of Waynesville, Mo.	1.4
12	Creasy Spring.....	do.....	Sec. 16, T. 36 N., R. 12 W., 5 miles northwest of Waynesville, Mo.	18.7
12	Bartlett Mill Spring.....	do.....	Sec. 16, T. 36 N., R. 12 W., 5 miles northwest of Waynesville, Mo.	.31
12	Roubidoux Creek.....	do.....	Sec. 25, T. 36 N., R. 12 W., just above Roubidoux Spring, at Waynesville, Mo.	.41
12	Roubidoux Spring.....	Roubidoux Creek.....	Sec. 25, T. 36 N., R. 12 W., at Waynesville, Mo.	5.7
18	Piney Creek.....	Gasconade River.....	Sec. 24, T. 32 N., R. 10 W., just above Boiling Spring, 8 miles southwest of Licking, Mo.	26.0
18	Boiling Spring.....	Piney Creek.....	Sec. 24, T. 32 N., R. 10 W., 8 miles southwest of Licking, Mo.	18.3
18	Hazleton Spring.....	do.....	Sec. 34, T. 33 N., R. 10 W., at Hazleton, Mo.	4.6
18	Slabtown Spring.....	do.....	Sec. 15, T. 33 N., R. 10 W., 5 miles south of Edanville, Mo.	8.7
18	Prewett Spring.....	do.....	Sec. 32, T. 34 N., R. 10 W., 1 mile north of Edanville, Mo.	16.5
20	Stone Mill Spring.....	do.....	Sec. 21, T. 35 N., R. 10 W., 2 miles southwest of Spring Creek, Mo.	18.0
20	Coppedge Spring.....	do.....	Sec. 36, T. 35 N., R. 10 W., at Relfe, Mo.	16.6
20	Ousley Spring.....	do.....	Sec. 10, T. 35 N., R. 10 W., 4 miles northeast of Spring Creek, Mo.	.95
12	Shanghai Spring.....	do.....	SW¼ sec. 25, T. 36 N., R. 11 W., 7 miles east of Waynesville, Mo.	7.8
21	Boiling Spring.....	Gasconade River.....	Sec. 33, T. 37 N., R. 10 W., 4 miles northeast of Hooker, Mo.	65
20	Piney Spring.....	Little Piney Creek.....	SE¼ sec. 4, T. 35 N., R. 8 W., 1½ miles southeast of Yancy Mills, Mo.	.1
20	Yancy Mill Spring.....	do.....	SW¼ sec. 32, T. 36 N., R. 8 W., at Yancy Mills, Mo.	3.0
21	Lane Spring.....	do.....	NW¼ sec. 32, T. 36 N., R. 8 W., ¾ mile north of Yancy Mills, Mo.	17.9
13	Wilkins Spring.....	Mill Creek.....	S½SE¼ sec. 17, T. 36 N., R. 9 W., 7 miles southwest of Newburg, Mo.	4.8
21	Gaines Ford Spring.....	Gasconade River.....	NW¼ sec. 35, T. 39 N., R. 9 W., 10 miles northwest of Rolla, Mo.	3.3
20	Paydown Spring.....	do.....	SW¼ sec. 2, T. 40 N., R. 8 W., near Paydown, Mo.	6.8

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