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UNITED STATES DEPARTMENT OF THE INTERIOR

**SURFACE WATER SUPPLY**  
*of the* **UNITED STATES**  
**1932**

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**PART 6**  
**MISSOURI RIVER BASIN**

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

**GEOLOGICAL SURVEY WATER-SUPPLY PAPER 731**

UNITED STATES DEPARTMENT OF THE INTERIOR  
HAROLD L. ICKES, Secretary  
GEOLOGICAL SURVEY  
W. C. MENDENHALL, Director

Water-Supply Paper 731

SURFACE WATER SUPPLY  
*of the* UNITED STATES  
1932

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

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FIGURE 1. Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.....	Page
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# SURFACE WATER SUPPLY OF MISSOURI RIVER BASIN, 1932

## 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, 1932.

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, 1895-1933*

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		
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.

Measurements of stream flow have been made at about 6,590 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July 1932, 2,790 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, 1931, and ending September 30, 1932. At the beginning of January in most parts of the United States much of the precipitation in the pre-



ceding 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 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.

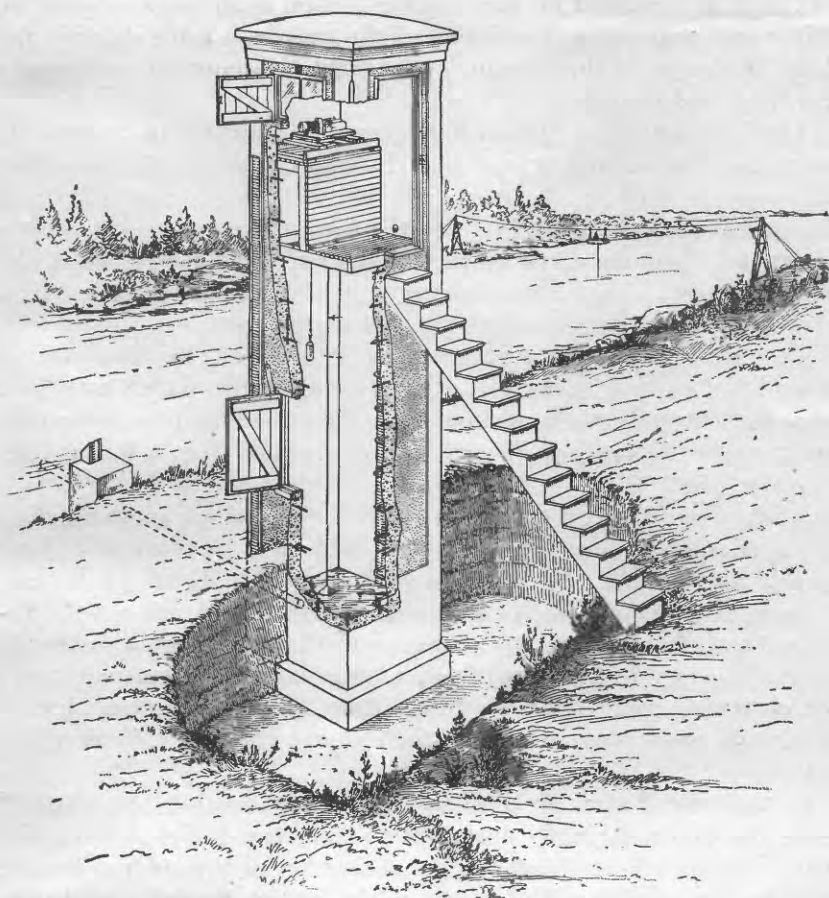


FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

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 determining 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 textbooks 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 gives 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, in addition to statements regarding location and type of gage, information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded discharges, and the accuracy of the records. The maximum discharge given under "Extremes" does not represent the crest discharge unless a water-stage recorder was in operation or a nonrecording gage was read at the time of the crest.

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 at regular intervals during 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 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 powers, 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 Bay and upper Mississippi River Basins.
6. Missouri River Basin.

**Part 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., 2500 Customhouse.  
 Hartford, Conn., 203 Federal Building.  
 Albany, N.Y., 603 State Public Works Building.  
 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., 630 Power 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., 632 State Office Building.  
 Iowa City, Iowa, 402 Hydraulic Laboratory, University of Iowa.  
 Topeka, Kans., State House.  
 Rolla, Mo., Missouri Geological Survey Building, Missouri School of Mines and Metallurgy.  
 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 6,590 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. 2	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	1893-94.
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years)	1895.
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 35 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	1906.
W 261 to 272	do	1907-8.
W 281 to 292	do	1909.
W 301 to 312	do	1910.
W 321 to 332	do	1911.
W 351 to 362	do	1912.
W 381 to 394	do	1913.
W 401 to 414	do	1914.
W 431 to 444	do	1915.
W 451 to 464	do	1916.
W 471 to 484	do	1917.
W 501 to 514	do	1918.
W 521 to 534	do	1919-20.
W 541 to 554	do	1921.
W 561 to 574	do	1922.
W 581 to 594	do	1923.
W 601 to 614	do	1924.
W 621 to 634	do	1925.
W 641 to 654	do	1926.
W 661 to 674	do	1927.
W 681 to 694	do	1928.
W 696 to 700	do	1929.
W 711 to 724	do	1930.
W 726 to 739	do	1931.
		1932.

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 1932. 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.

[For basins included see p. 5]

Year	1	2	3	4	5	6	7	8	9	10	11	12-A	12-B	12-C
1899 <sup>a</sup>	35	35	36	36	36	36, 37	37	37	37, 38	38, 39	38, 39	38	38	38
1900 <sup>a</sup>	47, 48	48	48, 49	49	49	49, 50	50	50	51	51	51	51	51	51
1901	65, 75	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
1902	82, 83	82, 83	82, 83	82, 83	82, 83	82, 83	84	84	85	85	85	85	85	85
1903	97	97	97	97	97	97	98	98	99	100	100	100	100	100
1904	124, 125, 126	126	128	129	130	131	132	132	133	133, 134	134	135	135	135
1905	165, 166, 167	167	169	170	170	172	174	174	175, 177	176, 177	177	178	178	178
1906	201, 202, 203	203	205	206	207	208	210	210	211, 213	212, 213	211	214	214	214
1907-8	241	242	243	244	245	246	248	248	249	250, 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1913	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919-20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1928	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1929	681	682	683	684	685	686	687	688	689	690	691	692	693	694
1930	696	697	698	699	700	701	702	703	704	705	706	707	708	709
1931	711	712	713	714	715	716	717	718	719	720	721	722	723	724
1932	726	727	728	729	730	731	732	733	734	735	736	737	738	739

<sup>a</sup> Rating tables and index to Water-Supply Papers 35-39 contained in Water-Supply Paper 39. Tables of monthly discharge for 1899 in Twenty-first Annual Report, part 4.

<sup>b</sup> James River only.

<sup>c</sup> Gallatin River.

<sup>d</sup> Green and Gunnison Rivers and Colorado River above junction with Gunnison River.

<sup>e</sup> Mohave River only.

<sup>f</sup> Kings and Kern Rivers and South Pacific slope basins.

<sup>g</sup> 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.

<sup>h</sup> Tables of monthly discharge for 1900 in Twenty-second Annual Report, part 4.

<sup>i</sup> Wissahickon and Schuylkill Rivers to James River.

<sup>j</sup> Soloto River.

<sup>k</sup> Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte River.

<sup>l</sup> Tributaries of Mississippi River from east.

<sup>m</sup> Lake Ontario and tributaries to St. Lawrence River proper.

<sup>n</sup> Hudson Bay only.

<sup>o</sup> New England rivers only.

<sup>p</sup> Hudson River to Delaware River, inclusive.

<sup>q</sup> Susquehanna River to Yackin River, inclusive.

<sup>r</sup> Platte and Kansas Rivers.

<sup>s</sup> The Great Basin in California, except Truckee and Carson River Basins.

<sup>t</sup> Below junction with Gila River.

<sup>u</sup> 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. H. Ross, commissioner; in Montana 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 engineer, John A. Whiting.

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 as international gaging stations.

Assistance in collecting records was also rendered by the following municipalities, organizations, and corporations: In Colorado by the city of Denver; in Missouri by the Union Electric Light & Power Co., the Gasconade River Power Co., and Missouri Electric Power Co.; in Montana by the Liberty-Montana Mines Co.; and in Yellowstone National Park by the National Park Service.

## DIVISION OF WORK

The data for the stations in the several States were collected and prepared for publication as follows: In Colorado, Iowa (except for the station on the Nishnabotna River above Hamburg), Nebraska (except for the station on the Missouri River at Nebraska City), South Dakota, Wyoming, and for the station on the Tongue River near Decker, Mont., by Robert Follansbee, 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, Miss Nellie L. Esterly, and Mrs. Elsie L. Yeatman; in Kansas by J. B. Spiegel, district engineer, assisted by Charles Wells, W. M. Littlefield, R. V. Smrha, H. Gerald Bobst, 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. Eyberg, and C. H. Jennings; in Montana and North Dakota (except for stations on the Madison River near West Yellowstone, Mont., and on the Tongue River near Decker, 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, J. R. Throckmorton, E. G. Bailey, V. S. Haugse, Miss E. H. Haugse, and Miss Josephine Ruick.

The records were reviewed and manuscript assembled by David S. Jenkins.



# 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 Fed Rock Reservoir and 8 miles northwest of Monida.

DRAINAGE AREA.—560 square miles.

RECORDS AVAILABLE.—July 1911 to September 1918; May 1925 to September 1932.

EXTREMES.—Maximum discharge during year, 566 second-feet Aug. 14 (gage height, 2.08 feet); minimum, 15 second-feet Aug. 19 to Sept. 2 (gage height, 0.20 foot).

1911-18, 1925-32: Maximum discharge, 1,220 second-feet Apr. 28, 1914 (gage height, 3.2 feet); minimum, 0.6 second-foot Sept. 27, 1931 (gage height, 0.01 foot).

REMARKS.—Records good. No records Oct. 1 to Apr. 16. Flood water stored in reservoir and released as required. Small irrigation diversions from tributaries above.

### Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-----	21	275	389	241	15	16	-----	73	340	349	453	37
2	-----	21	275	389	225	15	17	21	73	330	349	453	37
3	-----	21	275	389	189	21	18	21	154	311	349	164	37
4	-----	21	293	389	175	22	19	21	275	275	349	15	37
5	-----	21	293	389	192	23	20	21	311	275	349	15	38
6	-----	21	293	389	192	23	21	21	340	275	349	15	40
7	-----	21	293	410	159	26	22	21	369	275	349	15	40
8	-----	21	293	410	133	30	23	21	410	275	349	15	40
9	-----	24	293	410	113	30	24	21	410	275	330	15	40
10	-----	26	330	410	94	30	25	21	389	275	293	15	40
11	-----	27	349	410	94	30	26	21	369	258	311	15	40
12	-----	46	349	410	94	30	27	21	369	241	369	15	40
13	-----	69	349	453	275	30	28	21	340	241	330	15	40
14	-----	69	349	520	520	37	29	21	340	311	275	15	40
15	-----	73	349	431	475	37	30	21	330	410	275	15	40
							31	-----	293	-----	258	15	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 17-30	21	21	21.0	583
May	410	21	173	10,600
June	410	241	301	17,900
July	520	258	369	22,700
August	520	15	143	8,790
September	40	15	32.8	1,950
The period	-----	-----	-----	62,500

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 1,300 second-feet June 7 (gage height, 2.89 feet); minimum, 107 second-feet Sept. 22-26 (gage height, 0.47 foot).

1907-32: Maximum discharge, 3,640 second-feet June 18, 20, 1908 (gage height, 6.0 feet); minimum, 106 second-feet July 28, 29, Aug. 19-31, Sept. 1, 10-17, 1919 (gage height, 0.50 foot).

REMARKS.—Records good. Discharge not computed Nov. 24 to Mar. 31. Numerous diversions above station. Regulation caused by storage and release of flood waters of Red Rock River near Monida, Mont.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1.....	163	156	253	140	198	174	253	133
2.....	163	182	294	140	171	162	223	133
3.....	163	182	274	140	156	156	215	128
4.....	156	182	274	140	156	156	198	128
5.....	156	165	253	140	156	145	184	124
6.....	182	162	245	140	895	133	198	124
7.....	182	162	230	140	1,300	124	198	124
8.....	163	162	215	140	840	121	177	121
9.....	163	162	215	136	730	121	165	117
10.....	163	180	215	122	680	121	150	113
11.....	153	180	180	119	605	148	150	113
12.....	153	174	180	119	530	505	150	113
13.....	172	174	180	119	480	360	145	113
14.....	169	174	187	156	406	238	145	113
15.....	169	174	180	215	406	274	140	113
16.....	169	174	162	215	630	294	136	110
17.....	166	194	162	180	895	294	136	110
18.....	166	194	150	180	840	316	136	110
19.....	166	180	150	115	840	555	136	110
20.....	169	180	150	115	630	505	136	110
21.....	169	180	150	136	580	406	136	110
22.....	182	180	150	136	337	406	119	107
23.....	179	180	150	136	337	316	115	107
24.....	179	-----	150	136	294	274	112	107
25.....	179	-----	150	136	274	274	115	107
26.....	176	-----	150	145	274	274	115	107
27.....	163	-----	140	145	219	253	115	124
28.....	163	-----	143	253	198	249	115	124
29.....	160	-----	140	274	207	253	180	124
30.....	160	-----	140	274	177	294	160	124
31.....	160	-----	-----	274	-----	294	131	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	182	153	167	* 10,300
November 1-23.....	194	156	175	7,980
April.....	294	140	187	11,100
May.....	274	115	160	9,840
June.....	1,300	159	481	28,600
July.....	555	121	284	16,200
August.....	253	112	154	9,470
September.....	133	107	117	6,960

## 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 Beaverhead and Big Hole Rivers.

DRAINAGE AREA.—7,840 square miles.

RECORDS AVAILABLE.—August 1910 to September 1916; July 1920 to September 1932.

EXTREMES.—Maximum discharge during year, 6,960 second-feet June 19 (gage height, 5.30 feet); minimum, 182 second-feet Aug. 27 (gage height, 1.37 feet). 1910-16, 1920-32: Maximum discharge, 19,800 second-feet June 15, 1927 (gage height, 9.85 feet); minimum, 55 second-feet Sept. 10, 14, 1931 (gage height, 0.87 foot).

REMARKS.—Records good. No records Nov. 20 to Mar. 19. Numerous diversions. Flow partly regulated by operation of two reservoirs.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	484	560	-----	955	1,170	3,300	1,890	1,170	646
2.....	465	570	-----	1,120	1,170	2,870	1,640	1,060	705
3.....	431	617	-----	1,290	1,290	2,870	1,490	1,060	705
4.....	381	636	-----	1,560	1,720	2,870	1,420	1,010	705
5.....	414	636	-----	1,640	1,560	2,870	1,420	905	555
6.....	373	655	-----	1,490	1,560	4,210	1,290	855	617
7.....	406	655	-----	1,560	1,640	4,950	1,230	855	636
8.....	422	705	-----	1,360	1,640	6,700	1,120	905	636
9.....	422	705	-----	1,290	1,720	-----	1,010	755	617
10.....	422	705	-----	1,230	1,720	-----	1,010	705	541
11.....	406	755	-----	1,360	1,890	-----	1,010	655	512
12.....	422	755	-----	1,120	2,160	-----	1,170	655	494
13.....	397	755	-----	1,290	2,560	5,300	1,490	655	474
14.....	414	855	-----	1,640	3,080	-----	1,560	579	406
15.....	406	855	-----	1,560	3,750	-----	1,640	448	388
16.....	388	905	-----	1,560	3,980	-----	1,490	484	366
17.....	397	905	-----	1,490	3,750	-----	1,420	465	352
18.....	406	905	-----	1,420	3,300	6,700	1,540	431	359
19.....	397	955	-----	1,420	3,300	5,960	2,360	414	380
20.....	373	-----	1,060	1,360	3,750	5,950	2,870	338	397
21.....	380	-----	1,040	1,360	4,210	5,200	3,200	294	406
22.....	380	-----	1,010	1,290	4,950	3,980	3,520	250	474
23.....	397	-----	1,060	1,230	5,700	3,750	3,300	242	508
24.....	397	-----	1,120	1,170	4,700	3,520	2,260	224	508
25.....	448	-----	1,120	1,490	4,210	3,520	1,890	206	494
26.....	456	-----	1,019	1,170	3,300	3,520	1,800	186	522
27.....	410	-----	955	1,170	3,300	3,080	1,360	182	541
28.....	456	-----	955	1,170	3,300	2,660	1,230	246	560
29.....	474	-----	955	1,120	3,300	2,360	1,120	324	550
30.....	474	-----	1,010	1,120	3,750	2,070	1,010	512	522
31.....	532	-----	905	-----	3,750	-----	1,360	636	-----
Month	Maximum			Minimum		Mean		Run-off in acre-feet	
October.....	532			373		421		25,900	
November 1-19.....	955			560		742		28,000	
March 20-31.....	1,120			905		1,020		24,300	
April.....	1,640			955		1,330		79,100	
May.....	5,700			1,170		2,940		181,000	
June.....	6,960			2,070		4,390		261,000	
July.....	3,520			1,010		1,690		104,000	
August.....	1,170			182		565		34,900	
September.....	705			352		523		31,100	

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

LOCATION.—Water-stage recorder in SW $\frac{1}{4}$  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 1932.

EXTREMES.—Maximum discharge during year, 13,300 second-feet June 20 (gage height, 73.46 feet); minimum, 670 second-feet Dec. 20 (gage height, 66.14 feet).

1922-32: Maximum discharge, 33,300 second-feet June 14, 15, 18, 1927 (gage height, 78.80 feet); minimum, 500 second-feet Sept. 14, 1924, July 19, 1931 (gage height, 66.07 feet).

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

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,080	1,620	1,830	2,640	2,220	5,760	2,940	3,240	2,700	4,830	1,740	1,740
2	3,220	1,830	2,040	2,620	2,500	4,780	3,020	3,300	1,720	4,760	1,960	1,920
3	4,020	1,910	2,040	2,590	2,040	3,420	3,120	3,250	3,770	3,380	2,020	1,780
4	2,680	2,540	2,160	2,620	2,040	2,860	4,290	3,280	5,040	1,910	2,000	1,540
5	2,300	3,480	1,780	2,620	2,020	2,850	5,000	3,160	4,500	2,350	1,900	1,670
6	2,600	3,300	830	2,160	2,020	2,880	5,500	3,100	4,790	3,240	1,860	1,740
7	2,100	2,820	1,760	2,150	2,020	3,460	5,900	3,140	4,800	3,080	1,430	2,460
8	2,700	2,020	2,060	2,590	2,020	3,410	5,400	2,960	5,870	3,480	1,590	1,920
9	2,260	2,530	2,590	2,940	2,020	3,720	4,830	3,280	7,260	2,400	1,540	2,020
10	2,020	2,150	3,120	2,930	2,020	3,570	4,140	3,710	9,460	2,650	1,600	1,920
11	2,290	2,160	3,300	3,460	2,020	3,560	3,020	4,390	10,400	2,440	1,320	1,540
12	2,530	2,120	3,760	3,090	2,020	3,560	3,220	4,770	9,530	2,140	1,120	1,600
13	2,060	2,120	2,420	2,900	2,020	2,940	3,300	4,960	8,390	2,120	1,300	2,040
14	1,550	1,290	2,530	2,260	2,140	2,850	3,320	5,500	6,730	2,120	880	2,020
15	1,770	1,160	2,770	1,580	2,210	3,410	3,360	6,480	7,630	2,320	1,420	2,140
16	1,800	1,650	2,600	1,780	2,100	3,580	3,060	7,850	9,650	3,120	1,600	2,350
17	1,710	2,800	2,470	2,060	2,040	3,090	3,420	7,320	11,000	2,400	1,460	2,320
18	1,490	3,280	2,000	2,060	2,040	3,090	3,940	7,450	12,500	3,200	1,740	2,020
19	1,940	2,460	1,290	2,060	2,040	3,090	4,040	7,780	12,000	1,950	2,860	2,110
20	2,220	3,060	670	2,060	2,040	2,640	4,160	5,030	13,300	2,820	1,450	2,220
21	2,360	3,620	1,410	2,040	2,040	3,820	4,900	8,310	12,600	3,660	1,150	2,210
22	2,360	1,480	2,540	2,040	2,400	4,700	5,380	8,150	11,430	3,410	1,160	2,240
23	2,440	1,450	1,880	2,040	2,560	4,510	6,020	8,890	9,430	3,100	1,450	2,250
24	2,530	1,800	2,040	2,040	2,540	4,260	5,980	9,140	10,000	2,840	1,430	2,300
25	1,480	2,360	1,170	2,040	3,160	4,080	5,360	8,500	8,930	4,560	1,320	2,250
26	2,070	2,420	2,150	2,220	3,040	3,940	4,740	7,300	8,370	4,020	1,440	2,220
27	2,770	2,620	1,960	2,160	2,720	3,120	4,330	6,160	8,070	3,480	1,480	2,110
28	2,180	2,620	1,460	2,040	4,540	3,440	3,760	5,720	7,620	3,090	880	2,000
29	2,380	2,460	1,410	2,040	5,880	3,650	3,320	5,060	7,440	2,900	1,100	1,960
30	2,290	2,040	1,990	2,040	---	2,900	3,340	4,700	6,930	2,320	1,730	2,700
31	2,240	---	2,290	2,040	---	2,880	---	4,950	---	1,500	1,750	---

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	4,020	1,480	2,280	140,000
November	3,620	1,160	2,310	137,000
December	3,760	670	2,070	127,000
January	3,460	1,580	2,320	143,000
February	5,880	2,020	2,430	140,000
March	5,760	2,640	3,540	218,000
April	6,020	2,940	4,200	250,000
May	9,140	2,960	5,610	345,000
June	12,300	1,720	8,060	480,000
July	4,830	1,500	2,950	181,000
August	2,860	880	1,540	94,700
September	2,700	1,540	2,040	121,000
The year	13,300	670	3,280	2,380,000

## 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 1932. Prior to 1918 open-water season only.

EXTREMES.—Maximum discharge recorded during year, 23,500 second-feet June 13 (gage height, 5.95 feet); minimum, 1,220 second-feet Oct. 12 (gage height, 0.28 foot).

1881-91, 1902-32: Maximum discharge, 107,000 second-feet June 7, 1908 (gage height, 16.3 feet); minimum, that of Oct. 12, 1932.

REMARKS.—Records good except those estimated from records furnished by Montana Power Co. for period of ice effect, Nov. 22 to Mar. 31, which are fair. Numerous diversions from tributaries. Flow partly regulated by storage in reservoirs.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.					
1.....	2,330	2,960	6,000	2,560	3,180	7,010	4,860	6,760	8,360	12,100	3,620	2,880					
2.....	2,700	2,580					4,730	5,920	9,470	10,900	4,030	2,880					
3.....	2,330	2,330					5,140	5,920	7,820	8,540	3,760	2,880					
4.....	2,960	3,090					6,080	5,920	5,440	7,460	4,160	2,880					
5.....	2,960	4,580					7,100	5,920	5,600	7,460	4,300	2,880					
6.....	3,360	2,100	4,680	3,140	2,890	3,260	7,100	6,420	6,230	6,570	4,030	2,880					
7.....	2,830	5,300					7,820	5,920	8,000	4,720	4,030	2,880					
8.....	2,330	3,090					7,640	5,920	9,090	4,160	3,760	2,880					
9.....	4,860	2,960					7,820	6,420	11,700	4,030	4,030	2,910					
10.....	3,620	2,960					8,180	6,590	15,900	4,440	3,900	2,910					
11.....	3,360	3,090	5,180	3,020	2,610	4,590	8,000	6,590	19,600	3,900	3,900	3,040					
12.....	1,980	2,700					7,100	7,100	21,800	5,150	4,030	2,960					
13.....	2,210	2,580					6,250	8,360	21,800	4,860	4,440	2,930					
14.....	2,700	2,400					5,600	8,900	20,800	4,160	4,720	2,930					
15.....	3,090	2,830					5,290	10,100	19,100	4,150	4,720	2,830					
16.....	2,960	2,700	5,610	3,040	2,880	5,390	4,860	14,400	17,400	4,300	2,930	4,160					
17.....	3,090	3,220					5,000	15,400	19,100	4,030	3,090	4,160					
18.....	2,700	2,960					5,000	16,400	20,200	4,300	3,900	3,760					
19.....	2,960	3,620					5,000	16,400	20,800	4,300	3,760	3,490					
20.....	2,960	3,090					5,440	15,400	21,800	4,160	2,730	4,720					
21.....	3,360	2,960	5,240	5,220	2,910	2,480	5,530	5,760	15,400	22,400	4,160	5,400	4,440				
22.....	3,360	3,220						6,590	15,900	20,800	4,440	6,920	4,300				
23.....	3,360	4,920						4,580	2,650	4,630	5,200	7,100	16,900	20,200	4,030	10,500	5,000
24.....	2,960											8,000	17,400	19,600	4,160	6,460	4,720
25.....	2,700											8,540	16,400	18,600	4,160	3,760	4,480
26.....	2,700	4,580	2,650	4,630	5,200	7,640	8,900	15,400	16,900	3,900	3,010	1,680					
27.....	3,220						8,900	14,900	14,900	4,030	3,330	4,720					
28.....	3,490						8,360	13,900	14,900	4,300	3,120	4,860					
29.....	3,220						7,640	13,000	13,900	4,580	2,930	4,300					
30.....	2,700						7,280	11,700	12,100	4,580	2,960	4,580					
31.....	3,490							10,500		4,860	2,910						

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	4,860	1,980	3,000	184,000
November.....		2,100	3,660	218,000
December.....			5,190	319,000
January.....			2,880	177,000
February.....			3,060	176,000
March.....			5,160	317,000
April.....	8,900	4,730	6,700	399,000
May.....	17,400	5,920	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	1,680	5,750	4,180,000

## MISSOURI RIVER NEAR WOLF POINT, MONT.

LOCATION.—Chain gage in NW¼ sec. 28, T. 27 N., R. 48 E., at highway bridge 6 miles southwest of Wolf Point. Prior to Oct. 1, 1931, water-stage recorder at same location was used.

DRAINAGE AREA.—82,400 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932. September 1928 to April 1930 comparable record at ferry crossing at Wolf Point, 6 miles upstream.

EXTREMES.—Maximum discharge during year, 41,000 second-feet May 23 (gage height, 14.82 feet); minimum discharge, 1,790 second-feet Nov. 26.

1928-32: Maximum discharge, 41,000 second-feet May 23, 1932; maximum stage, 17.45 feet Mar. 30, 1930; minimum discharge, 1,700 second-feet Nov. 23, 1931.

REMARKS.—Records fair. Discharge estimated for period of ice effect, Nov. 18 to Apr. 3. Numerous diversions from tributaries. Flow partly regulated by storage reservoirs above power plants.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3,520	*3,620					12,100	14,700	17,100	18,800	4,100	6,160
2.....	*3,710	3,520					12,100	13,700	17,100	18,200	4,500	5,160
3.....	3,900	3,330					12,100	11,400	16,800	16,400	4,500	6,430
4.....	*3,710	3,140					12,700	10,800	16,800	15,800	4,500	8,050
5.....	3,520	3,520					11,400	10,100	12,100	15,400	4,500	5,650
6.....	3,140	3,520	2,650	3,100	2,500	6,200	10,800	9,820	11,100	15,100	4,710	4,300
7.....	2,950	3,710					10,500	8,900	11,400	13,400	4,710	4,100
8.....	*3,830	*3,520					9,820	10,500	15,400	11,400	4,300	3,900
9.....	4,710	3,330					8,900	9,820	32,400	9,820	4,300	3,520
10.....	3,140	3,710					9,200	7,780	35,400	9,200	4,500	3,710
11.....	*3,270	*3,620					9,510	7,780	33,200	8,610	4,930	2,440
12.....	*3,400	3,520					9,510	7,510	33,700	7,780	12,700	3,330
13.....	3,520	4,300					9,820	8,330	34,500	6,700	11,700	4,930
14.....	3,710	4,500					9,510	8,610	35,800	5,400	11,100	4,300
15.....	3,900	*4,200	2,500	3,200	2,350	3,350	10,100	9,200	35,400	4,930	8,900	3,900
16.....	4,500	3,900					9,200	9,200	34,500	5,650	6,430	3,520
17.....	*4,050	3,140					9,200	9,510	34,900	*6,180	5,400	3,330
18.....	3,600	3,140					8,330	10,100	34,100	6,700	4,710	*3,050
19.....	3,140	2,600					7,240	10,800	31,100	6,700	*5,700	2,770
20.....	*3,240	*2,600					6,430	16,400	28,700	6,700	6,700	2,950
21.....	3,330	2,600					5,900	17,100	28,700	6,430	5,400	3,330
22.....	*3,520	*2,520					5,400	17,800	27,900	5,900	4,710	3,710
23.....	3,710	2,440					6,160	41,000	27,100	4,710	4,710	3,900
24.....	3,520	*2,230					6,970	17,500	27,100	5,400	6,160	4,100
25.....	*3,420	2,020	2,600	3,300	3,700	6,950	14,700	17,100	26,300	*5,160	11,100	*4,300
26.....	3,330	1,790					12,100	17,800	26,300	5,160	*12,900	4,500
27.....	*3,520	2,020					11,100	19,900	25,900	4,710	14,700	4,710
28.....	3,710	2,020					10,800	20,300	24,000	4,500	11,700	4,710
29.....	*3,800	*2,080					11,400	19,600	22,500	4,300	9,510	4,300
30.....	3,900	2,150					13,400	17,800	20,300	4,300	8,900	3,900
31.....	3,710							17,100		4,300	*7,530	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	4,710	2,950	3,610	222,000
November.....	4,500	1,790	3,080	183,000
December.....			2,580	159,000
January.....			3,200	197,000
February.....			2,820	162,000
March.....			5,550	341,000
April.....	14,700	5,400	9,880	588,000
May.....	41,000	7,510	13,800	848,000
June.....	35,800	11,100	25,900	1,540,000
July.....	18,800	4,300	8,510	523,000
August.....	14,700	4,300	7,100	437,000
September.....	8,050	2,440	4,230	252,000
The year.....	41,000	1,790	7,510	5,460,000

\* 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 1932.

EXTREMES.—Maximum discharge during year, 99,200 second-feet June 29 (gage height, 10.93 feet); minimum, 3,340 second-feet Dec. 3.

1928-32: Maximum discharge, 231,000 second-feet Apr. 4, 1931 (gage height, 18.0 feet); minimum, that of Dec. 3, 1931.

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

REMARKS.—Records good except those for periods of ice effect, Nov. 21 to Apr. 2, which are fair. Numerous diversions above station. Several storage reservoirs on tributary streams.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	11,100	8,620	3,560	8,070	5,810	9,170	26,000	22,700	38,800	83,000	13,500	13,900
2-----	10,700	8,620	3,560	8,430	5,640	9,550	27,800	24,000	37,600	76,200	13,500	13,500
3-----	10,300	8,800	3,340	9,170	5,470	9,930	22,100	24,800	42,500	69,400	13,500	13,500
4-----	10,300	8,430	3,450	9,170	5,300	9,360	18,200	23,400	41,200	67,700	13,500	13,100
5-----	10,300	8,250	3,800	9,170	5,130	9,170	13,100	22,700	40,000	64,500	13,100	13,500
6-----	9,550	8,250	4,060	8,620	4,960	8,800	12,700	22,100	37,600	61,300	12,700	12,700
7-----	9,170	8,250	4,060	7,890	4,960	8,800	12,700	24,700	37,600	56,500	12,700	11,500
8-----	8,980	8,250	4,340	7,000	4,800	8,430	13,500	25,500	40,000	50,600	12,300	11,500
9-----	8,980	8,250	4,960	6,830	4,490	8,250	14,300	23,400	55,000	45,100	11,500	11,500
10-----	8,430	8,250	5,130	7,000	4,490	8,620	14,700	27,000	71,100	40,000	11,500	11,100
11-----	8,430	8,250	4,960	7,180	4,340	8,800	15,100	33,300	84,800	35,400	10,700	10,700
12-----	9,170	8,070	5,130	7,180	4,490	9,170	15,100	27,800	92,000	32,300	10,700	10,300
13-----	9,550	7,890	5,130	6,830	4,500	9,550	15,100	24,000	88,400	29,500	14,300	9,930
14-----	9,360	8,250	4,800	6,660	4,960	9,360	15,500	22,700	79,600	27,000	17,500	9,930
15-----	9,170	8,430	4,960	6,320	5,470	9,360	16,400	23,400	71,100	26,200	15,500	9,930
16-----	9,170	8,620	4,960	5,980	5,810	9,170	16,800	30,400	67,700	26,200	15,500	10,700
17-----	8,980	9,170	4,800	5,640	5,980	8,250	16,800	41,200	69,400	26,200	15,500	11,100
18-----	8,980	8,980	4,640	5,640	6,150	7,890	16,800	46,400	79,600	26,200	13,500	10,700
19-----	9,360	7,000	4,800	5,300	5,980	8,070	17,300	47,800	86,600	25,500	13,100	9,930
20-----	9,550	5,810	4,640	4,960	5,640	8,250	17,800	43,800	88,400	24,000	11,500	9,550
21-----	8,980	5,130	4,800	4,800	5,810	9,930	17,800	42,500	83,000	27,000	10,700	9,550
22-----	8,250	4,960	4,960	4,640	5,810	9,930	18,200	46,400	77,900	24,800	11,100	9,550
23-----	7,890	4,490	5,130	4,800	5,640	11,500	18,800	53,500	76,200	23,400	11,500	9,930
24-----	8,070	4,200	5,300	4,800	5,470	11,900	24,800	61,300	74,500	21,500	11,500	9,930
25-----	8,250	4,640	5,810	4,960	5,640	13,500	32,300	64,500	74,500	19,300	11,500	10,300
26-----	8,250	4,640	5,980	5,300	6,150	14,700	45,100	67,700	83,000	17,800	12,300	10,700
27-----	8,070	4,640	6,150	5,640	7,350	15,100	45,100	64,500	83,000	16,800	11,100	11,100
28-----	7,890	4,640	6,320	6,320	7,710	14,700	33,300	53,500	84,800	16,400	12,300	11,100
29-----	8,070	4,200	7,000	6,320	8,980	14,700	27,800	47,800	95,600	15,900	15,500	10,300
30-----	8,430	3,800	7,350	6,150	-----	15,500	24,000	45,100	92,000	15,100	16,400	10,300
31-----	8,620	-----	7,710	5,980	-----	18,800	-----	42,500	-----	14,300	14,700	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	11,100	7,890	9,040	556,000
November-----	9,170	3,800	6,900	416,000
December-----	7,710	3,340	5,020	309,000
January-----	9,170	4,640	6,540	402,000
February-----	8,980	4,340	5,630	324,000
March-----	18,800	7,890	10,600	652,000
April-----	45,100	12,700	20,800	1,240,000
May-----	67,700	22,100	37,800	2,320,000
June-----	95,600	37,600	69,100	4,110,000
July-----	83,000	14,300	35,600	2,190,000
August-----	17,300	10,700	13,100	806,000
September-----	13,900	9,550	11,000	655,000
The year-----	95,600	3,340	19,300	14,000,000

## MISSOURI RIVER AT SANISH, N.DAK.

LOCATION.—Wire gage in W½ sec. 14, T. 152 N., R. 93 W., at highway bridge at Sanish.

RECORDS AVAILABLE.—September 1928 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 100,000 second-feet June 12-13; maximum stage, 10.9 feet Apr. 2 (caused by ice); minimum, 3,250 second-feet Nov. 22 (gage height, -0.37 foot).

1928-32: Maximum discharge, that of June 12, 13, 1932; minimum, that of Nov. 22, 1932.

Maximum stage recorded, 14.2 feet Mar. 19, 1929, during ice gorge.

REMARKS.—Records good except those for period of ice effect, Nov. 24 to Apr. 2, which are fair. Numerous diversions above station. Several storage reservoirs on tributary streams.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	10,000	8,300	4,400	8,000	6,000	9,270	26,200	22,600	45,800	84,800	15,000	16,500
2-----	10,400	8,300	3,600	8,000	6,000	10,000	48,200	21,900	42,300	75,600	14,100	14,600
3-----	10,400	8,600	3,400	8,300	6,000	10,000	50,700	23,300	44,600	70,200	13,600	13,600
4-----	10,400	8,930	3,400	8,930	5,750	10,800	37,000	24,000	49,400	66,700	14,100	13,600
5-----	10,000	8,600	3,400	8,930	5,750	10,800	24,700	21,900	45,800	63,400	13,600	13,600
6-----	9,270	8,930	3,600	9,270	5,750	9,640	17,000	21,200	44,600	58,900	13,200	13,600
7-----	10,000	8,000	4,000	8,930	5,750	9,270	16,000	20,500	43,400	56,000	13,200	13,200
8-----	9,270	8,300	4,200	8,600	5,500	8,930	15,500	23,300	43,400	52,000	12,800	11,900
9-----	8,600	8,600	4,800	8,300	5,250	8,600	16,000	22,600	47,000	48,200	11,900	11,900
10-----	8,600	8,600	4,800	7,700	5,500	8,930	16,000	22,600	47,000	41,200	11,900	11,500
11-----	8,600	8,600	5,250	7,400	5,250	10,800	15,500	22,600	88,600	39,000	11,500	11,200
12-----	8,300	8,600	5,500	6,500	5,000	10,800	15,500	29,500	100,000	36,000	11,200	10,800
13-----	8,600	8,300	5,500	6,250	4,800	10,800	15,000	29,500	100,000	32,200	11,200	10,400
14-----	8,600	8,000	5,750	6,250	4,600	10,800	15,000	20,500	86,700	30,400	11,900	10,000
15-----	8,600	8,000	5,750	6,000	4,400	10,800	16,000	19,800	75,600	27,800	18,600	10,000
16-----	8,930	8,930	5,500	5,750	4,600	11,200	17,000	21,900	68,400	27,800	17,500	9,640
17-----	8,930	8,600	5,250	5,750	5,000	11,500	18,000	31,300	72,000	27,800	16,500	10,400
18-----	8,930	8,600	5,000	5,500	5,750	11,200	18,000	43,400	70,200	27,800	16,500	11,500
19-----	8,930	8,600	4,800	5,500	5,750	10,400	18,600	49,400	81,000	27,800	15,000	11,200
20-----	8,390	5,250	4,600	5,500	5,750	10,000	18,000	49,400	86,700	27,800	14,100	10,000
21-----	9,270	4,400	4,600	5,250	5,750	10,000	19,200	43,400	86,700	27,000	12,400	9,640
22-----	8,930	3,250	4,600	5,000	5,500	10,800	19,800	42,300	79,200	29,500	10,800	9,640
23-----	8,930	3,800	4,800	5,250	6,250	10,400	19,800	48,200	75,600	29,500	11,200	9,270
24-----	8,300	4,600	5,000	5,250	5,250	10,800	19,200	56,000	73,800	26,200	11,500	9,640
25-----	8,600	4,800	5,500	5,250	5,500	12,300	22,600	61,900	72,000	23,300	11,900	9,640
26-----	8,300	4,800	5,750	5,500	6,250	15,000	39,000	65,000	73,800	20,500	12,400	10,000
27-----	8,600	4,800	6,000	5,250	7,100	16,000	45,800	68,400	88,600	19,200	12,400	10,400
28-----	8,000	4,600	6,250	5,750	7,400	17,500	39,000	60,400	79,200	18,000	11,500	10,800
29-----	8,000	4,600	6,800	6,000	8,000	16,000	37,000	50,700	82,900	17,000	11,500	10,800
30-----	8,000	4,200	7,100	6,000	-----	17,500	25,400	47,000	96,500	16,000	17,500	10,400
31-----	8,000	-----	7,400	6,000	-----	18,600	-----	45,800	-----	15,500	18,600	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	10,400	8,000	8,940	550,000
November-----	8,930	3,250	7,020	418,000
December-----	7,400	3,400	5,040	310,000
January-----	9,270	5,000	6,640	408,000
February-----	8,000	4,400	5,660	328,000
March-----	18,600	8,600	11,600	713,000
April-----	50,700	16,000	24,000	1,430,000
May-----	68,400	19,800	36,300	2,230,000
June-----	100,000	42,300	70,400	4,190,000
July-----	84,800	15,500	37,500	2,310,000
August-----	18,600	10,800	13,500	830,000
September-----	16,500	9,270	11,300	672,000
The year-----	100,000	3,250	19,800	14,400,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 118,000 second-feet June 13 (gage height, 8.33 feet); minimum, 3,690 second-feet Dec. 10.

1904-5, 1928-32: Maximum discharge, 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 discharge, that of Dec. 10, 1931; minimum gage height, -1.93 feet Sept. 15, 1931.

REMARKS.—Records good except those for period of ice effect, Nov. 21 to Apr. 1, which are fair. Numerous diversions above station. Several storage reservoirs on tributaries.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	9,560	8,360	4,530	6,860	4,680	10,600	26,500	35,400	41,600	101,000	18,000	12,800
2-----	9,880	8,360	4,680	7,100	4,680	11,300	74,200	28,000	41,600	99,400	17,000	15,700
3-----	10,200	8,360	4,830	7,590	4,980	11,700	72,300	23,300	36,500	91,400	16,100	18,600
4-----	10,200	8,360	4,680	7,840	5,300	12,000	79,900	21,600	34,300	83,700	15,300	15,700
5-----	10,200	8,640	4,530	8,100	5,460	12,000	48,800	22,100	37,700	78,000	14,500	14,500
6-----	10,600	8,640	4,380	8,100	5,630	12,400	30,500	21,600	40,300	74,200	14,000	14,000
7-----	10,600	8,930	4,380	8,360	5,630	12,400	21,000	20,000	37,700	65,100	14,000	14,000
8-----	10,600	8,930	4,100	8,360	5,630	12,800	17,500	18,500	34,300	59,800	13,600	14,000
9-----	10,600	8,930	3,820	8,360	5,630	13,200	16,100	18,500	33,300	54,900	13,200	14,000
10-----	10,600	8,930	3,690	8,640	5,460	13,600	15,700	19,500	49,400	51,800	12,400	13,600
11-----	9,880	8,930	3,820	8,360	5,300	13,200	15,700	21,000	76,100	43,000	12,400	12,800
12-----	9,560	8,640	4,100	8,100	5,300	13,200	16,100	20,500	97,400	37,700	12,000	12,400
13-----	9,240	8,640	4,240	7,590	4,980	12,800	16,100	22,700	116,000	34,300	12,000	12,400
14-----	8,930	8,640	4,530	6,860	4,680	12,400	16,100	27,200	112,000	31,400	11,700	11,700
15-----	8,930	8,640	4,830	6,000	4,680	12,400	15,700	24,500	93,400	28,800	11,300	11,300
16-----	8,640	8,640	5,140	5,810	4,380	11,700	15,300	22,100	76,100	27,200	11,000	10,600
17-----	8,930	8,640	5,460	5,630	4,380	11,300	15,300	21,600	66,900	26,500	14,000	10,200
18-----	8,930	8,360	5,810	5,460	4,530	11,300	15,700	23,900	72,300	26,500	16,600	10,200
19-----	9,240	8,360	6,000	5,460	4,980	11,300	15,700	37,700	76,100	26,500	16,600	10,200
20-----	8,930	8,360	6,200	5,460	4,980	11,300	15,700	45,800	78,000	27,200	16,100	9,880
21-----	9,240	6,410	6,200	5,300	5,300	11,700	15,700	48,800	89,400	28,000	16,100	9,880
22-----	8,930	5,460	6,200	5,460	5,630	11,300	15,700	43,000	87,500	28,000	15,300	9,880
23-----	8,930	5,300	6,200	5,630	5,630	11,000	15,700	41,600	79,900	28,000	14,500	10,200
24-----	9,240	4,530	6,000	5,630	5,810	11,000	19,000	45,800	74,200	28,000	13,200	10,200
25-----	9,240	4,380	6,000	5,630	5,810	11,000	22,700	58,100	74,200	29,600	12,000	10,200
26-----	8,930	3,820	6,000	5,630	6,200	10,600	22,100	72,300	72,300	27,200	12,000	9,880
27-----	8,930	3,820	5,810	5,300	7,340	10,600	27,200	79,900	74,200	25,100	12,000	9,880
28-----	8,640	3,820	5,630	5,140	8,640	11,300	45,800	70,500	85,600	23,300	12,400	9,880
29-----	8,360	3,960	5,630	4,830	9,560	13,200	50,300	63,300	91,400	21,000	12,400	10,200
30-----	8,360	4,380	6,200	4,680	-----	19,000	43,000	50,300	95,400	20,000	12,800	10,200
31-----	8,360	-----	6,630	4,530	-----	25,100	-----	44,400	-----	19,000	12,400	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	10,600	8,360	9,400	578,000
November-----	8,930	3,820	7,270	433,000
December-----	6,630	3,690	5,170	318,000
January-----	8,640	4,530	6,510	400,000
February-----	9,560	4,380	5,560	320,000
March-----	25,100	10,600	12,500	769,000
April-----	79,900	15,300	27,900	1,660,000
May-----	79,900	18,500	35,900	2,210,000
June-----	116,000	33,300	69,200	4,120,000
July-----	101,000	19,000	43,400	2,670,000
August-----	18,000	11,000	13,800	848,000
September-----	16,600	9,880	11,900	708,000
The year-----	116,000	3,690	20,700	15,100,000

## 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 (lowered 0.8 foot Oct. 1, 1931) is 1,528.45 feet above mean sea level.

DRAINAGE AREA.—209,000 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 119,000 second-feet June 14 (gage height, 11.26 feet); minimum occurred during winter.

1928-32: Maximum discharge, 164,000 second-feet Mar. 29, 1929 (gage height, 12.2 feet, present datum); minimum occurred during winter of 1930-31.

REMARKS.—Records good except those for period Nov. 26 to Mar. 31, which were based on four discharge measurements and temperature records.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,240	8,560	6,500	5,200	16,000	44,500	33,900	47,400	100,000	19,500	12,800
2	7,790	8,410				78,400	31,100	47,400	102,000	18,500	12,700
3	8,850	8,390				79,900	27,500	46,700	90,300	17,900	12,700
4	9,260	8,350				72,900	23,700	39,900	77,500	16,900	14,600
5	9,560	8,320				65,900	22,800	36,400	70,800	16,100	16,500
6	9,860	8,150	6,470	5,000	19,400	58,900	23,100	38,900	71,000	15,000	16,100
7	9,920	8,240				40,800	24,200	42,900	67,300	14,700	15,100
8	10,100	8,320				28,300	23,000	42,900	62,000	14,500	14,200
9	9,890	8,380				21,700	21,500	41,700	60,800	14,400	13,400
10	9,290	8,500				19,400	20,600	40,100	55,800	14,200	13,500
11	9,470	8,500	6,000	4,600	14,700	18,200	19,900	72,900	51,500	13,700	13,600
12	9,470	8,500				17,100	22,500	94,200	46,800	13,300	13,200
13	9,410	8,640				17,000	23,100	109,000	42,000	12,800	12,700
14	9,290	8,790				16,100	22,900	118,000	35,700	12,800	12,100
15	8,880	8,820				15,800	27,500	111,000	33,100	12,800	11,900
16	8,700	8,900	6,250	4,270	14,100	14,900	28,300	94,400	31,500	12,300	11,500
17	8,350	8,730				14,200	23,600	84,300	29,600	12,000	11,200
18	8,580	8,580				14,700	21,600	72,200	28,900	11,900	10,600
19	8,530	8,580				14,700	22,200	75,300	27,400	14,100	10,200
20	8,410	8,150				14,100	37,200	70,000	28,300	16,700	10,200
21	8,990	7,100	6,200	6,800	15,300	15,300	44,500	82,500	28,300	17,500	9,860
22	9,200	4,840	6,150			15,400	46,600	90,000	29,100	17,000	10,100
23	9,220	4,710	6,130			15,000	41,600	85,100	29,100	16,500	10,600
24	9,140	4,700	6,250			15,300	38,200	79,400	29,300	15,900	11,100
25	9,320	4,650	6,300			15,700	38,900	74,800	29,200	14,700	11,300
26	9,260	4,700	6,000	9,000	17,200	17,200	59,000	71,000	29,400	13,700	11,200
27	9,080					18,500	66,200	70,500	28,900	13,000	10,900
28	8,820					23,700	66,400	75,600	27,700	12,300	10,600
29	9,140					34,900	70,300	95,800	24,300	12,200	10,500
30	8,990					36,100	62,700	101,000	22,100	12,300	10,400
31	8,730						52,000		20,700	12,300	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	10,100	7,240	9,050	556,000
November	8,900		7,300	434,000
December			5,100	314,000
January			6,230	383,000
February			5,860	337,000
March			14,200	873,000
April	79,900	14,100	29,200	1,740,000
May	70,300	19,900	35,100	2,160,000
June	118,000	36,400	71,900	4,280,000
July	102,000	20,700	45,500	2,800,000
August	19,500	11,900	14,600	898,000
September	16,500	9,860	12,200	726,000
The year	118,000		21,300	15,500,000

## MISSOURI RIVER AT PIERRE, S.DAK.

LOCATION.—Water-stage recorder installed Feb. 17, 1932, in SW¼ sec. 32, T. 111 N., R. 79 W., at Pierre, 1½ miles above mouth of Bad River. Zero of gage is 1,415.1 feet above mean sea level. Prior to Feb. 17, 1932, chain gage with zero 2.0 feet higher was used.

DRAINAGE AREA.—242,000 square miles.

RECORDS AVAILABLE.—October 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 121,000 second-feet June 15 (gage height, 10.96 feet); minimum occurred during winter.

1930-32: Maximum discharge, that of June 15, 1932; minimum, that of 1932.

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

REMARKS.—Records good except those for Nov. 30 to Mar. 26, which were based on four discharge measurements and temperature records.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	6,280	9,850	4,700	6,600	5,400	18,000	18,400	46,800	54,900	99,000	22,700	14,700
2.....	6,370	9,480					24,400	43,500	59,500	106,000	21,700	14,700
3.....	6,490	9,190					65,500	39,100	47,800	106,000	20,900	14,700
4.....	6,970	8,940					65,900	34,900	47,300	99,200	19,600	14,700
5.....	7,310	8,760					74,300	30,800	42,900	83,200	18,600	14,900
6.....	8,280	8,690	4,300	6,400	5,300	9,500	81,200	29,600	38,700	78,500	17,900	15,400
7.....	9,260	8,560					67,700	37,500	38,000	73,600	17,200	16,300
8.....	9,630	8,490					46,400	39,000	39,100	69,400	16,500	16,400
9.....	9,740	8,450					33,200	32,000	47,600	63,700	15,800	15,200
10.....	9,920	8,520					25,100	25,100	49,200	60,500	15,300	13,600
11.....	10,100	8,730	4,000	6,100	5,550	8,500	21,000	25,300	42,600	56,600	15,100	13,400
12.....	10,400	8,760					19,100	23,200	66,900	52,800	15,100	13,200
13.....	10,400	8,830					17,900	22,900	101,000	49,500	14,700	12,900
14.....	10,300	8,900					17,700	23,500	114,000	44,300	14,400	13,200
15.....	10,100	8,730					17,400	24,000	120,000	39,100	14,400	13,200
16.....	10,200	8,620	5,300	6,300	5,450	11,000	17,000	23,600	119,000	35,700	14,900	13,200
17.....	10,000	8,520					16,800	26,400	111,000	33,800	15,400	12,600
18.....	9,920	8,450					16,900	28,700	90,300	32,600	15,400	11,900
19.....	9,630	8,420					16,300	25,800	78,500	31,100	15,000	11,300
20.....	9,520	8,350					16,000	22,800	81,400	29,600	15,900	11,000
21.....	9,410	8,520	5,400	6,000	5,900	21,500	15,600	29,200	83,600	28,500	17,400	10,800
22.....	9,370	9,630					15,400	47,300	97,200	28,000	19,300	10,600
23.....	9,440	8,800					15,000	48,700	103,000	28,100	20,400	10,200
24.....	9,740	5,580					17,500	43,300	99,000	28,400	20,200	10,000
25.....	9,630	5,020					17,700	42,600	87,800	28,400	20,500	10,100
26.....	9,960	4,520	7,100	5,600	5,450	10,000	46,000	25,000	43,100	84,700	28,100	19,400
27.....	10,100	4,380					44,200	27,700	58,000	75,900	28,000	18,500
28.....	10,100	4,640					30,900	27,200	62,800	73,800	28,500	17,800
29.....	10,100	4,800					27,400	34,700	64,100	75,200	28,700	16,700
30.....	10,000	5,200					22,000	48,900	67,300	92,900	26,800	15,600
31.....	10,200						20,800		62,000		24,500	14,700

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	10,400	6,280	9,320	573,000
November.....	9,850	4,380	7,880	469,000
December.....			5,200	320,000
January.....			6,160	379,000
February.....			6,130	353,000
March.....			17,200	1,060,000
April.....	81,200	15,000	30,800	1,830,000
May.....	67,300	22,800	37,900	2,330,000
June.....	120,000	38,000	75,400	4,490,000
July.....	106,000	24,500	50,000	3,070,000
August.....	22,700	14,400	17,300	1,060,000
September.....	16,400	10,000	12,700	755,000
The year.....	120,000		23,000	16,700,000

## MISSOURI RIVER AT YANKTON, S.DAK.

LOCATION.—Water-stage recorder installed Sept. 14, 1932, 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 (formerly published in error) above mean sea level. Prior to Sept. 14, 1932, chain gage at same location and datum was used.

DRAINAGE AREA.—269,000 square miles.

RECORDS AVAILABLE.—November 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 124,000 second-feet June 18 (gage height, 9.68 feet); minimum occurred during winter.

1930-32: Maximum discharge, that of June 18, 1932; minimum occurred during winter.

REMARKS.—Records good except those for Dec. 1 to Mar. 25, which were based on four discharge measurements and temperature records.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	8,340	10,600	7,000	7,650	25,000	32,300	35,800	75,200	74,300	31,400	16,700
2.....	8,470	11,000				28,000	47,600	72,300	81,400	31,500	15,700
3.....	8,360	11,300				24,000	47,300	68,000	91,000	29,900	14,600
4.....	9,480	11,400				23,300	46,000	63,500	98,400	30,000	13,800
5.....	9,130	11,300				55,200	43,300	66,200	97,700	27,800	13,200
6.....	9,350	11,300	6,500	7,850	12,000	72,700	42,200	54,900	92,500	27,200	13,200
7.....	9,850	11,000				73,400	41,900	48,800	84,300	26,100	13,200
8.....	10,100	10,600				80,200	52,600	43,700	79,800	23,700	13,000
9.....	9,960	10,500				66,200	63,300	42,300	77,400	24,200	13,000
10.....	10,400	10,500				53,000	55,900	51,900	74,300	21,900	13,400
11.....	9,960	10,200	6,300	8,000	8,500	37,300	41,600	48,400	64,400	20,500	14,200
12.....	9,260	10,200				31,100	38,000	51,600	59,900	23,100	16,400
13.....	10,800	10,200				25,300	33,000	59,900	57,400	20,800	19,200
14.....	11,800	10,200				22,300	25,600	80,500	53,300	20,200	19,100
15.....	11,700	10,300				19,900	26,200	109,000	48,300	19,500	17,000
16.....	11,500	10,500	6,800	8,100	10,000	18,800	26,300	112,000	43,400	19,300	16,800
17.....	11,600	10,600			12,000	17,800	25,600	119,000	39,000	18,800	15,800
18.....	11,500	10,800			14,000	17,600	25,400	123,000	34,800	18,500	15,200
19.....	11,600	11,000			16,000	18,000	25,100	112,000	32,500	19,800	15,000
20.....	11,200	11,300			17,900	17,700	25,000	97,700	30,200	19,000	14,600
21.....	10,800	11,300	7,600	9,500	20,000	17,500	28,000	85,800	33,700	18,400	14,500
22.....	11,000	10,600			24,000	17,400	29,300	81,700	33,300	18,000	14,000
23.....	11,300	9,320			28,000	17,600	28,300	79,800	32,900	17,600	13,600
24.....	10,800	7,350			32,700	17,600	27,200	85,500	32,500	17,300	13,200
25.....	10,700	6,910			35,000	18,400	53,100	91,200	31,400	17,300	12,800
26.....	10,200	6,770	7,400	11,700	42,600	18,900	73,400	86,800	31,200	19,900	12,600
27.....	9,890	6,780			31,500	19,400	56,100	80,500	30,500	22,100	12,400
28.....	10,100	6,770			29,300	25,300	48,600	78,100	30,600	22,900	12,300
29.....	10,700	6,560			41,900	36,100	59,300	77,400	30,700	21,700	12,400
30.....	10,700	6,400			45,000	34,100	72,300	75,900	30,800	19,500	12,400
31.....	10,700				35,200		70,000		31,000	17,600	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	11,800	8,340	10,400	640,900
November.....	11,400	6,400	9,790	583,000
December.....			6,200	381,000
January.....			6,990	430,000
February.....			8,600	495,000
March.....	45,000		21,400	1,320,000
April.....	80,200	17,400	31,900	1,900,000
May.....	73,400	25,000	42,300	2,610,000
June.....	123,000	42,300	77,400	4,610,000
July.....	98,400	30,200	53,600	3,300,000
August.....	31,500	17,300	22,100	1,360,000
September.....	19,200	12,300	14,400	857,000
The year.....	123,000		25,400	18,500,000

## MISSOURI RIVER AT OMAHA, NEBR.

LOCATION.—Water-stage recorder installed Oct. 19, 1931, 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 mean sea level. Prior to Oct. 19, 1931, and during winter chain gage half a mile upstream was used.

DRAINAGE AREA.—323,000 square miles.

RECORDS AVAILABLE.—September 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 137,000 second-feet June 19 (gage height, 15.12 feet); minimum, 4,940 second-feet Dec. 16, 17 (gage height, 3.2 feet).

1928-32: Maximum discharge, 198,000 second-feet June 7, 1929 (gage height, 14.28 feet); minimum, that of Dec. 16, 17, 1931.

REMARKS.—Records good except those for period Dec. 1-31, which are fair. Stage-discharge relation affected by ice Jan. 8 to Feb. 23, Mar. 3-23; discharge based on six discharge measurements and temperature records.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	8,370	11,000	6,340	10,700	8,680	14,600	59,200	43,400	66,000	74,700	28,670	25,600
2.....	8,180	11,000	6,340	10,400	8,680	24,800	44,800	38,800	70,200	70,700	29,070	23,700
3.....	8,050	10,900	6,700	10,700	8,680	35,000	37,000	45,000	71,800	70,000	29,770	21,300
4.....	8,050	10,900	5,720	9,500	8,400	42,000	30,800	55,300	66,000	77,100	29,770	19,100
5.....	8,150	11,000	5,590	8,100	8,500	30,000	28,200	53,000	61,700	86,500	30,370	16,900
6.....	10,600	11,000	5,590	7,350	8,600	27,000	28,400	53,900	58,000	91,000	29,070	15,900
7.....	9,620	11,000	5,720	5,470	8,800	25,000	53,200	59,500	55,300	92,600	29,870	15,000
8.....	11,200	11,200	5,470	5,250	8,400	13,000	63,200	49,100	50,000	88,100	28,570	14,500
9.....	10,900	11,400	5,470	5,100	8,500	12,500	60,400	45,000	48,500	78,400	26,670	14,200
10.....	10,600	11,500	5,470	5,300	8,670	12,000	56,800	47,400	49,700	72,300	25,870	14,000
11.....	10,200	11,500	5,720	5,700	8,670	10,000	61,400	70,200	52,100	69,400	23,070	14,600
12.....	9,360	12,500	6,340		8,670	9,000	50,400	63,000	56,300	66,500	27,970	15,000
13.....	10,500	11,300	6,170	5,030	9,200	7,800	39,500	45,700	55,200	63,800	22,170	14,800
14.....	9,640	11,000	5,860			7,800	33,200	39,400	57,700	63,200	23,200	15,700
15.....	9,640	11,000	5,140			9,500	29,200	33,500	61,200	72,300	28,100	18,300
16.....	9,670	11,100	4,940	7,000	9,300	10,400	25,800	29,400	87,500	58,400	22,900	20,500
17.....	10,300	11,300	4,940			15,000	23,800	26,800	117,000	55,000	22,200	20,500
18.....	11,100	11,200	5,720			19,600	21,800	25,200	128,000	52,000	20,670	18,400
19.....	11,200	11,100	5,590			24,600	20,600	24,900	129,000	47,800	18,900	17,000
20.....	11,300	11,300	5,860			29,000	20,600	24,000	129,000	45,500	17,900	16,100
21.....	11,600	11,400	5,860	8,500	9,500	32,000	24,000	24,300	125,000	41,200	17,400	16,600
22.....	11,500	11,500	5,590			9,000	40,000	23,200	103,000	38,300	17,800	16,300
23.....	11,500	13,900	5,860			9,400	28,000	28,400	23,000	91,000	35,300	18,000
24.....	11,500	15,300	6,170			9,910	25,800	29,400	28,200	85,900	33,200	18,000
25.....	11,600	14,600	6,700			10,100	32,300	26,200	30,700	86,200	31,900	17,800
26.....	11,800	13,100	6,010	8,300	10,200	55,800	24,400	35,900	89,900	31,800	17,200	13,800
27.....	11,700	10,800	6,900			12,000	66,400	23,000	66,200	91,000	32,000	16,900
28.....	11,600	8,570	7,840			13,600	48,100	22,800	82,400	86,800	30,300	17,500
29.....	11,300	7,800	8,930			15,400	39,500	22,700	61,200	80,800	29,200	19,500
30.....	11,300	7,610	9,500			45,000	29,000	50,600	78,200	28,200	21,500	12,900
31.....	11,200	-----	9,790	-----	-----	58,200	-----	60,000	-----	27,700	24,900	-----

Month	Maximum	Minimum	Mean	R in-off in acre-feet
October.....	11,800	8,050	10,400	640,000
November.....	15,300	7,610	11,300	672,000
December.....	9,790	4,940	6,250	384,000
January.....	10,700	-----	7,550	464,000
February.....	15,400	-----	9,530	548,000
March.....	66,400	-----	27,400	1,680,000
April.....	69,200	20,600	34,700	2,060,000
May.....	82,400	23,000	43,800	2,690,000
June.....	129,000	48,500	79,600	4,740,000
July.....	92,600	27,700	56,200	3,460,000
August.....	30,300	16,900	23,200	1,430,000
September.....	25,600	12,900	16,500	982,000
The year.....	129,000	4,940	27,200	13,800,000

## MISSOURI RIVER AT NEBRASKA CITY, NEBR.

LOCATION.—Chain gage 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 1932.

EXTREMES.—Maximum discharge during year, 138,000 second-feet June 17-19; maximum gage height, 12.9 feet June 17; minimum, 7,800 second-feet Jan. 9 (gage height, 4.4 feet).

1929-32: Maximum discharge and gage height, those of June 1932; minimum discharge, 4,500 second-feet Dec. 3, 1929 (gage height, 4.30 feet).

Maximum stage known, 18.0 feet (revised) in April 1881.

REMARKS.—Records good except those for periods of ice effect, Feb. 1-24, Mar. 10-18, which are poor.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	11,200	13,500	9,800	20,300	12,600	53,200	61,800	50,700	70,500	78,100	33,300	29,200
2.....	11,600	13,300	10,200	17,600	12,600	61,900	54,600	50,700	95,400	74,100	34,500	28,000
3.....	11,200	13,300	12,000	16,600	13,000	67,600	46,600	49,000	93,600	76,000	38,600	25,700
4.....	10,600	13,300	11,200	16,100	13,000	80,000	42,200	62,900	90,800	79,700	38,600	22,900
5.....	10,200	13,300	11,200	13,200	13,700	78,300	39,700	57,500	78,100	96,200	37,200	22,100
6.....	12,600	13,760	10,900	12,400	13,400	65,900	37,700	55,800	74,100	102,000	33,300	20,700
7.....	14,900	13,700	10,600	11,700	13,400	44,000	57,900	68,400	72,200	106,000	34,500	19,400
8.....	12,800	14,300	10,200	10,300	13,000	20,200	76,000	66,500	72,200	100,000	37,200	17,800
9.....	13,500	14,000	9,900	7,800	13,000	22,300	78,000	57,300	64,700	90,800	33,300	17,100
10.....	13,100	14,400	9,900	8,400	12,600	22,300	73,900	45,800	82,700	80,300	30,900	17,100
11.....	13,900	14,800	11,200	8,700	12,600	20,900	69,700	68,400	80,300	78,100	30,900	17,100
12.....	13,500	14,300	13,400	9,000	14,000	21,300	56,600	72,200	76,000	74,100	67,500	17,600
13.....	13,100	15,300	14,000	8,700	14,400	20,700	45,700	49,000	74,100	70,300	55,800	18,100
14.....	14,200	14,800	14,000	8,700	14,800	20,100	39,200	42,800	70,300	65,500	42,800	18,100
15.....	13,100	14,300	12,600	8,700	15,200	20,100	34,600	38,600	76,000	62,900	42,800	19,500
16.....	13,500	14,300	10,200	8,700	15,600	20,700	32,400	35,800	85,300	61,100	45,800	22,200
17.....	13,500	15,800	9,300	8,700	16,600	20,700	33,600	33,300	138,000	67,500	37,200	24,800
18.....	13,900	16,300	9,700	8,700	16,600	20,700	23,700	29,700	138,000	55,800	30,900	23,000
19.....	14,200	14,300	8,000	8,700	17,100	41,700	28,700	29,500	138,000	50,700	27,300	21,500
20.....	14,500	13,800	9,900	9,000	17,100	47,100	27,800	29,500	136,000	45,800	23,000	20,800
21.....	14,500	14,800	11,200	9,300	17,100	41,700	28,700	29,500	130,000	43,800	22,200	19,500
22.....	14,500	15,300	11,600	9,600	17,100	48,600	32,400	29,500	112,000	40,900	21,400	21,400
23.....	14,500	24,200	12,300	10,600	18,100	43,000	30,600	29,300	95,300	39,600	21,400	20,700
24.....	14,500	25,300	13,400	11,200	20,100	36,900	32,400	30,500	88,100	36,800	21,400	20,000
25.....	14,500	22,900	14,400	12,300	30,600	38,000	32,400	36,500	92,000	34,300	21,400	18,700
26.....	13,900	19,500	14,800	12,300	31,500	51,500	29,600	36,500	97,600	35,500	22,200	18,200
27.....	14,200	16,800	14,400	12,300	31,500	65,700	30,600	57,800	100,000	35,500	21,400	17,600
28.....	14,200	13,000	14,400	12,300	35,800	56,600	31,500	74,200	99,600	34,300	19,300	17,100
29.....	14,200	11,200	15,200	12,300	50,000	45,700	30,600	74,300	91,300	30,900	19,300	17,100
30.....	13,900	10,500	19,100	12,300	-----	45,700	31,500	56,400	88,700	30,900	20,000	16,600
31.....	13,900	-----	17,600	12,300	-----	58,300	-----	63,300	-----	30,900	25,000	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	14,900	10,200	13,400	824,000
November.....	25,300	10,500	15,300	910,000
December.....	17,600	8,700	12,100	744,000
January.....	20,300	7,800	11,300	695,000
February.....	50,000	12,600	18,500	1,060,000
March.....	80,000	20,100	42,000	2,580,000
April.....	76,000	27,800	42,400	2,520,000
May.....	74,300	29,300	48,800	3,000,000
June.....	138,000	64,700	93,400	5,560,000
July.....	106,000	30,900	61,300	3,770,000
August.....	57,500	19,300	31,600	1,940,000
September.....	29,200	16,600	20,300	1,210,000
The year.....	138,000	7,800	34,200	24,800,000



## 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. Prior to Oct. 21, 1931, chain gage at same location and datum was used.

DRAINAGE AREA.—424,000 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 150,000 second-feet June 20 (gage height, 10.3 feet); minimum discharge, 11,900 second-feet Oct. 5, 6; minimum gage height, -1.1 feet Jan. 9.

1928-32: Maximum discharge, 196,000 second-feet June 4, 1929 (gage height, 10.1 feet); minimum discharge, 8,800 second-feet Dec. 26, 27, 1929; minimum gage height, -2.7 feet Jan. 10, 1930.

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

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.			
1.	14,500	14,500	18,200	32,700	18,200	64,900	54,300	36,100	60,700	87,500	33,500	38,000			
2.	13,700	14,500	17,200	35,700	17,300	60,700	62,300	49,500	71,000	80,700	36,500	35,300			
3.	12,200	14,100	16,800	32,500	16,900	66,300	52,000	54,100	110,000	80,700	37,500	33,300			
4.	12,200	14,100	16,900	26,700	15,300	74,800	46,500	55,200	118,000	88,100	38,500	30,200			
5.	11,900	14,100	16,500	25,200	21,700	87,400	42,600	66,500	104,000	103,000	39,600	27,900			
6.	11,900	13,700	16,100	24,200	20,700	85,600	39,900	62,100	87,000	107,000	37,500	25,100			
7.	13,300	14,100	15,300	20,200	20,300	52,900	40,800	66,500	79,000	109,000	36,500	23,600			
8.	21,700	14,100	14,900	14,200	19,300	26,800	50,900	80,700	76,000	110,000	37,500	22,200			
9.	22,200	14,500	14,900	12,900	18,800	22,200	72,900	71,000	80,600	109,000	37,500	20,800			
10.	18,200	14,500	14,900	12,900	18,800	17,700	78,000	57,900	79,600	98,400	35,500	19,900			
11.	21,200	14,900	15,300	13,200	20,300	17,700	79,800	53,900	88,700	87,500	30,800	19,500			
12.	24,200	15,700	19,700	12,900	24,800	18,700	76,200	69,500	88,700	84,100	30,800	18,600			
13.	21,200	16,100	21,700	13,700	24,800	19,200	58,100	74,200	85,400	79,000	74,200	19,000			
14.	19,700	21,200	21,700	17,300	22,800	21,700	47,600	53,900	80,600	72,600	74,200	20,400			
15.	17,300	23,200	22,200	16,900	21,300	26,200	41,700	47,600	77,500	69,500	63,500	21,300			
16.	16,500	19,200	20,700	18,200	21,800	27,400	39,900	44,000	80,600	66,500	59,300	20,800			
17.	15,700	23,200	18,900	16,900	25,800	28,600	40,300	39,600	86,400	65,000	66,500	21,300			
18.	14,500	21,200	16,500	16,500	30,300	34,500	34,500	36,500	125,000	60,700	59,300	23,600			
19.	14,500	19,700	15,700	16,100	28,200	39,400	32,900	33,500	138,000	56,500	51,300	25,100			
20.	14,500	21,700	15,000	17,300	29,600	47,000	34,500	31,700	149,000	53,900	40,600	24,600			
21.	14,500	19,700	15,000	21,200	28,900	52,500	32,900	31,700	149,000	47,600	31,900	23,600			
22.	14,500	19,200	15,700	24,200	30,300	45,900	32,900	31,700	138,000	45,200	28,200	25,100			
23.	14,900	26,600	16,900	24,200	34,700	52,500	42,100	31,700	112,000	44,000	25,500	25,700			
24.	14,900	57,000	17,300	22,200	32,300	48,100	40,300	30,800	92,900	41,800	24,900	25,100			
25.	14,500	51,600	17,300	21,200	28,700	42,000	40,300	32,600	89,300	40,700	22,900	24,100			
26.	15,300	41,300	18,100	19,700	31,100	42,000	40,300	39,600	100,000	37,600	22,400	22,200			
27.	15,300	36,300	19,300	19,200	37,100	57,500	37,700	42,900	108,000	36,500	23,500	21,300			
28.	14,900	28,400	19,700	19,700	37,100	72,300	36,100	65,000	106,000	35,500	26,200	19,900			
29.	14,900	22,800	19,300	20,200	58,700	58,900	36,900	77,400	98,400	34,500	22,400	19,900			
30.	14,900	20,700	19,900	23,200		48,100	36,900	65,000	91,100	31,500	21,400	19,000			
31.	14,900		22,200	21,200		41,900		65,000		31,500	21,900				
Month								Maximum		Minimum		Mean		Run-off in acre-feet	
October								24,200		11,900		16,000		984,000	
November								57,000		13,700		22,100		1,320,000	
December								22,200		14,900		17,700		1,090,000	
January								35,700		12,900		20,400		1,250,000	
February								58,700		15,300		26,100		1,500,000	
March								87,400		17,700		45,200		2,780,000	
April								79,800		32,900		46,700		2,780,000	
May								80,700		30,800		51,500		3,170,000	
June								149,000		60,700		98,400		5,860,000	
July								110,000		31,500		67,600		4,160,000	
August								74,200		21,400		38,400		2,360,000	
September								38,000		18,600		23,900		1,420,000	
The year								149,000		11,900		39,500		28,700,000	

## 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 1932.

EXTREMES.—Maximum discharge during year, 178,000 second-feet June 21 (gage height, 20.9 feet); minimum, 12,900 second-feet Mar. 12 (gage height, 2.7 feet).

1928-32: Maximum discharge, 254,000 second-feet June 5, 1929 (gage height, 23.4 feet); minimum discharge, 9,500 second-feet Dec. 26, 27, 1929; minimum gage height, 2.4 feet Jan. 10, Dec. 27, 1930.

Maximum stage known, 38.0 feet June 16, 1844 (date revised).

REMARKS.—Records good.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24,700	16,400	41,800	40,200	21,400	71,000	57,000	42,600	79,100	102,000	36,800	31,600
2	20,700	16,400	31,300	61,600	20,300	70,000	70,000	41,800	81,100	96,700	36,800	40,800
3	18,400	16,000	26,500	61,600	17,500	68,200	74,000	57,500	94,800	91,400	39,500	39,200
4	18,000	16,000	24,900	51,700	16,700	76,000	60,600	60,100	129,000	97,800	42,200	44,800
5	16,800	15,600	23,400	47,500	17,000	83,200	51,700	58,900	122,000	129,000	41,400	38,400
6	15,200	15,200	23,900	45,800	18,100	91,500	45,800	71,000	111,000	148,000	43,000	34,600
7	14,400	15,200	23,000	38,600	22,100	93,600	42,600	70,000	102,000	130,000	44,600	33,500
8	15,200	15,200	22,100	26,700	36,300	58,100	43,400	79,000	92,600	126,000	44,600	30,300
9	20,700	15,200	22,100	18,400	24,100	22,100	64,500	58,300	95,900	125,000	43,000	27,200
10	25,900	16,000	23,000	16,100	24,100	17,000	84,100	75,000	99,000	115,000	43,800	24,400
11	27,200	16,700	25,400	15,300	25,100	13,200	85,200	65,300	103,000	102,000	40,600	23,900
12	26,600	18,200	29,800	16,500	26,800	12,900	86,200	64,400	114,000	97,000	38,300	22,100
13	30,600	19,800	34,200	18,000	32,900	14,400	80,000	84,100	107,000	91,600	43,800	22,100
14	33,600	29,600	35,500	22,900	35,500	15,500	62,600	78,000	101,000	81,200	75,000	21,300
15	33,600	51,400	34,200	29,100	34,800	18,500	51,100	59,900	87,300	75,000	69,100	21,700
16	27,700	53,900	29,800	26,100	30,900	40,600	44,600	53,700	83,400	72,000	65,400	23,000
17	25,100	58,000	26,400	25,000	29,700	29,200	46,800	49,500	88,400	66,000	67,200	23,000
18	22,400	75,000	23,900	23,400	32,200	29,200	49,300	43,800	115,000	63,200	70,000	22,100
19	19,800	65,300	21,700	21,900	37,600	38,400	42,000	40,600	146,000	59,600	64,500	23,900
20	18,200	50,100	20,000	21,500	39,200	48,100	40,400	36,800	159,000	56,000	57,100	31,700
21	27,700	42,800	19,600	22,900	40,000	56,900	48,500	34,800	174,000	52,500	48,300	33,000
22	17,500	44,700	19,600	26,700	39,200	62,200	44,400	33,600	166,000	48,900	41,000	32,300
23	17,500	65,800	20,000	32,200	39,200	59,500	46,200	33,000	152,000	47,300	34,100	31,700
24	17,100	105,000	20,400	32,200	42,200	64,100	55,500	33,000	127,000	46,500	31,000	36,100
25	17,200	137,000	21,300	29,700	39,800	57,600	53,700	32,300	109,000	42,400	29,700	33,500
26	16,800	118,000	20,800	26,700	38,300	54,900	51,900	34,800	115,000	40,800	30,300	31,600
27	17,600	97,900	21,700	24,900	39,800	57,600	48,700	40,600	121,000	39,200	28,400	29,100
28	18,000	82,100	22,100	24,400	43,800	76,000	46,600	50,900	130,000	38,400	30,300	25,500
29	18,000	67,100	23,000	24,400	50,300	79,100	43,400	77,000	121,000	36,800	31,000	23,900
30	17,600	51,700	23,000	23,400	-----	65,000	43,400	85,200	112,000	37,600	28,400	22,900
31	16,600	-----	26,400	22,500	-----	54,900	-----	78,000	-----	36,800	28,800	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	33,600	14,400	20,900	1,290,000
November	137,000	15,200	47,100	2,800,000
December	41,800	19,600	25,200	1,550,000
January	61,600	15,300	29,600	1,820,000
February	50,300	16,700	31,500	1,810,100
March	93,600	12,900	51,600	3,170,000
April	86,200	40,400	55,500	3,300,000
May	88,300	32,300	56,600	3,480,000
June	174,000	79,100	115,000	6,840,000
July	148,000	36,800	77,200	4,750,000
August	75,000	28,400	44,100	2,710,000
September	44,800	21,300	29,300	1,740,000
The year	174,000	12,900	48,600	35,300,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 167,000 second-feet June 23 (gage height, 24.0 feet); minimum, 10,700 second-feet Mar. 13, 14 (gage height, 8.30 feet).

1929-32: Maximum discharge, 263,000 second-feet June 5, 1929 (gage height, 24.9 feet); minimum discharge, 8,200 second-feet Dec. 27, 1929; minimum gage height, 5.4 feet Jan. 12, 1930.

Maximum stage known, 25.9 feet July 22, 1915.

REMARKS.—Records good. Gage-height records furnished by Corps of Engineers, United States Army.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31,200	16,900	50,500	32,600	17,800	55,600	57,000	44,100	83,900	106,000	37,900	27,700
2	26,500	16,600	37,900	49,000	15,000	73,800	57,000	41,400	82,600	97,000	38,900	29,900
3	21,600	16,100	30,100	63,400	20,700	70,200	73,200	43,200	85,300	94,200	40,100	42,000
4	18,400	16,100	25,700	58,000	17,800	69,000	73,200	69,200	102,000	90,000	41,400	39,300
5	18,400	16,100	24,400	50,000	15,900	77,500	60,200	60,200	125,000	100,000	44,200	44,400
6	17,400	15,400	23,100	51,000	18,300	88,300	52,000	66,200	122,000	136,000	44,200	39,300
7	16,400	15,400	26,000	47,000	19,300	33,800	46,000	79,500	112,000	144,000	45,600	35,000
8	15,000	15,400	24,200	37,400	23,700	80,500	42,300	78,300	103,300	135,000	46,400	33,200
9	15,000	15,400	24,200	28,600	33,100	42,400	44,100	88,600	93,200	132,000	45,600	31,100
10	18,900	15,400	23,700	21,200	28,900	18,300	73,200	92,500	98,000	126,000	44,200	28,300
11	26,000	15,400	24,200	18,800	25,200	14,100	89,600	77,100	191,000	113,000	44,200	26,100
12	28,200	16,900	27,200	17,300	26,400	11,900	91,000	67,200	106,000	103,000	41,400	24,000
13	26,500	18,800	30,600	18,300	28,200	11,100	89,600	67,200	117,000	97,000	38,900	23,500
14	29,400	17,700	35,100	20,200	32,000	11,100	76,900	86,900	111,000	88,600	50,700	22,400
15	33,000	29,900	36,600	23,700	36,500	13,200	57,000	78,100	103,000	80,800	82,300	22,400
16	33,600	53,700	35,100	31,400	36,500	23,200	47,000	60,200	88,000	73,400	73,800	22,400
17	28,200	58,400	31,400	27,200	33,500	31,600	44,100	67,000	89,400	69,800	66,800	23,500
18	25,400	64,400	27,900	26,600	31,300	28,200	48,000	49,000	90,800	67,400	70,200	23,500
19	22,600	83,600	26,000	24,800	34,200	33,100	49,100	44,100	119,000	62,700	69,000	22,900
20	19,900	67,600	23,200	23,700	39,600	36,900	41,400	40,500	146,000	59,200	62,500	24,500
21	18,900	51,000	22,000	23,200	39,600	55,000	41,400	38,200	158,000	57,100	53,300	29,800
22	17,900	43,100	20,730	24,200	41,100	61,400	49,000	36,100	164,000	52,000	44,200	32,100
23	17,400	58,200	20,700	27,200	40,400	62,200	45,000	34,600	166,000	49,000	37,700	31,500
24	17,400	91,000	20,700	32,100	40,400	64,400	48,000	33,800	158,000	49,000	32,800	32,100
25	16,900	126,000	23,700	32,800	42,800	69,000	57,000	33,100	134,000	47,000	29,900	33,800
26	16,900	144,000	23,700	29,200	40,400	61,100	55,000	32,400	112,000	45,000	29,400	34,800
27	16,900	122,000	23,700	27,200	38,000	56,000	54,000	33,100	118,000	43,100	30,500	32,500
28	16,400	99,000	24,200	26,000	39,600	62,500	51,000	38,200	123,000	39,500	28,300	29,700
29	16,900	80,700	24,200	24,800	44,600	83,000	49,000	55,000	129,000	39,500	29,400	27,000
30	16,900	64,900	25,200	24,200	-----	80,500	45,000	84,200	119,000	38,700	29,400	26,000
31	17,400	-----	26,200	22,200	-----	63,700	-----	92,400	-----	37,200	27,700	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	33,600	15,000	21,300	1,310,000
November	144,000	15,400	48,800	2,900,000
December	50,500	20,700	27,200	1,670,000
January	63,400	17,300	31,100	1,910,000
February	44,600	15,000	31,100	1,790,000
March	93,800	11,100	51,700	3,180,000
April	91,000	41,400	56,900	3,390,000
May	92,800	32,400	57,800	3,550,000
June	166,000	82,600	115,000	6,840,000
July	144,000	37,200	79,700	4,900,000
August	82,300	27,700	45,200	2,780,000
September	44,400	22,400	29,800	1,770,000
The year	166,000	11,100	49,600	36,000,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 221,000 second-feet Nov. 28 (gage height, 21.50 feet); minimum discharge, 16,300 second-feet Nov. 12; minimum gage height, 3.90 feet Mar. 15.

1926-32: Maximum discharge, 381,000 second-feet Apr. 23, 1927 (gage height, 23.9 feet); minimum, 9,550 second-feet Dec. 24, 1929 (gage height, 2.1 feet).

Maximum stage known, 32.7 feet June 21, 1844.

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	45,200	21,400	151,000	43,600	26,100	46,000	69,300	50,800	96,500	124,000	41,200	31,400
2.....	34,700	20,800	165,000	69,800	19,300	59,600	59,600	48,400	98,000	111,000	38,800	30,000
3.....	29,200	19,800	68,100	91,500	23,400	78,500	59,600	46,000	95,000	99,000	49,500	33,900
4.....	25,200	18,800	54,800	109,000	22,800	77,100	71,700	45,300	104,000	93,000	59,500	41,600
5.....	22,000	18,300	46,000	115,000	21,800	73,000	75,700	54,800	131,000	94,500	61,300	42,000
6.....	20,500	17,800	39,900	117,000	21,300	81,400	63,200	63,200	151,000	114,000	56,900	45,300
7.....	20,000	17,300	36,500	114,000	21,300	91,500	54,800	67,200	151,000	146,000	49,500	42,800
8.....	21,000	17,300	34,600	102,000	22,300	91,500	48,300	81,100	138,000	154,000	51,100	37,200
9.....	28,000	16,800	33,500	81,500	27,200	73,000	45,000	86,800	113,000	146,000	58,600	34,100
10.....	36,300	16,800	33,000	57,800	35,500	43,600	47,300	95,500	99,500	138,000	61,300	32,600
11.....	38,600	16,800	34,100	41,500	32,700	28,500	72,000	104,000	102,000	131,000	52,800	30,700
12.....	37,000	16,300	39,900	35,400	31,000	21,400	90,000	89,600	104,000	117,000	48,600	27,800
13.....	43,300	20,200	50,800	32,000	34,400	18,800	94,500	74,500	107,000	105,000	52,800	27,100
14.....	57,300	30,700	58,400	33,700	35,500	18,800	96,000	73,300	118,000	100,000	53,300	25,800
15.....	60,700	35,200	63,200	40,200	38,500	18,300	85,500	89,600	118,000	89,500	52,500	25,100
16.....	59,500	56,000	57,200	45,800	40,500	19,300	65,100	85,400	109,000	79,500	96,000	24,500
17.....	54,300	90,000	48,300	44,300	40,500	25,100	53,000	66,000	96,000	71,500	102,000	25,100
18.....	40,300	108,000	41,300	39,500	41,200	34,000	49,800	58,800	91,800	66,600	98,000	25,100
19.....	33,200	125,000	35,800	37,600	41,900	35,500	52,700	54,800	96,000	64,200	100,000	24,000
20.....	28,200	143,000	33,500	36,500	44,000	36,600	55,000	50,000	115,000	63,000	102,000	26,000
21.....	24,500	139,000	31,300	34,300	46,200	41,200	47,100	46,000	144,000	59,400	98,000	26,500
22.....	21,800	133,000	29,600	32,600	46,200	56,800	47,100	41,200	164,000	58,200	89,000	29,100
23.....	21,300	128,000	28,500	34,300	47,000	65,200	67,300	38,500	171,000	56,000	72,000	32,700
24.....	19,700	135,000	28,000	37,600	46,200	65,200	73,700	36,100	174,000	50,800	56,900	31,400
25.....	19,700	162,000	26,800	40,800	46,200	68,800	73,700	35,000	165,000	49,900	46,200	32,900
26.....	19,200	191,000	26,300	40,200	46,400	76,300	76,000	34,400	143,000	49,900	38,000	35,100
27.....	19,200	216,000	25,800	37,600	44,800	77,700	69,000	33,300	124,000	47,500	38,000	35,900
28.....	19,200	221,000	25,200	34,800	42,000	76,300	59,200	34,300	120,000	48,300	40,400	34,100
29.....	21,300	215,000	25,200	33,200	42,800	76,300	56,000	37,100	127,000	46,000	36,400	31,900
30.....	23,400	186,000	25,200	30,500	-----	90,000	49,900	55,100	132,000	42,800	33,400	29,000
31.....	22,300	-----	27,400	28,800	-----	87,000	-----	80,000	-----	40,600	34,100	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	60,700	19,200	31,300	1,920,000
November.....	221,000	16,300	85,100	5,060,000
December.....	151,000	25,200	44,000	2,710,000
January.....	117,000	28,800	53,900	3,310,000
February.....	47,000	19,300	35,500	2,040,000
March.....	91,500	18,300	56,500	3,470,000
April.....	96,000	45,000	64,200	3,820,000
May.....	104,000	33,300	60,100	3,700,000
June.....	174,000	91,800	123,000	7,320,000
July.....	154,000	40,600	85,700	5,270,000
August.....	102,000	33,400	60,300	3,710,000
September.....	45,300	24,000	31,700	1,890,000
The year.....	221,000	16,300	60,900	44,200,000

## MISSOURI RIVER NEAR BONNOTS MILL, MO.

LOCATION.—Water-stage recorder in SE¼NE¼ sec. 5, T. 44 N., R. 9 W., 1½ 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 1932; at Isbell, 2 miles downstream, December 1928 to September 1931.

EXTREMES.—Maximum discharge during year, 265,000 second-feet Nov. 29 (gage height, 19.44 feet); minimum, 19,700 second-feet Oct. 7.

REMARKS.—Records good.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	56,700	26,300	194,000	53,700	36,200	52,600	86,500	51,700	90,000	146,000	43,800	39,000
2-----	48,300	24,800	158,000	64,200	36,800	62,400	71,200	47,200	95,600	139,000	40,400	36,900
3-----	38,000	23,100	124,000	87,800	36,200	84,100	62,400	46,300	101,000	120,000	43,600	34,800
4-----	31,600	22,500	95,400	109,000	38,200	91,200	62,400	44,500	100,000	108,000	56,300	37,600
5-----	26,100	22,000	75,700	131,000	36,800	88,400	73,400	47,200	110,000	104,000	63,500	43,600
6-----	22,400	21,500	60,300	141,000	38,200	88,400	75,700	58,300	129,000	113,000	62,400	44,500
7-----	19,700	21,500	44,900	134,000	36,200	96,400	63,500	62,400	143,000	137,000	58,300	45,400
8-----	20,700	20,800	42,400	119,000	34,900	110,000	56,300	72,300	147,000	163,000	49,900	43,600
9-----	20,700	19,900	43,000	106,000	36,800	106,000	50,800	85,300	141,000	166,000	53,500	39,000
10-----	24,800	19,900	42,200	84,100	43,000	82,900	47,200	91,700	117,000	162,000	59,300	35,500
11-----	35,100	21,100	40,700	61,300	51,200	55,300	52,600	104,000	104,000	155,000	56,300	34,800
12-----	37,300	21,600	43,200	49,000	50,300	38,300	79,300	100,000	105,000	144,000	51,700	32,800
13-----	46,700	22,000	51,900	44,500	46,800	30,900	95,800	84,100	106,000	130,000	49,900	30,900
14-----	71,800	28,000	60,000	39,700	46,800	25,300	100,000	74,500	111,000	119,000	55,300	30,300
15-----	75,100	34,800	68,300	42,800	42,400	25,800	97,200	78,100	116,000	110,000	55,300	29,100
16-----	70,700	42,000	73,700	51,700	48,300	28,500	84,100	99,100	117,000	97,400	73,400	29,100
17-----	66,300	72,900	68,200	62,400	55,300	28,500	67,900	82,900	111,000	87,100	100,000	28,500
18-----	57,700	104,000	60,100	56,300	56,300	33,500	58,300	66,800	96,600	79,900	101,000	28,000
19-----	45,800	119,000	53,800	50,800	55,300	41,200	54,400	60,300	92,400	76,400	99,000	28,000
20-----	38,700	136,000	48,400	48,100	53,500	39,700	57,300	55,300	101,000	73,100	105,000	28,000
21-----	33,700	145,000	42,000	45,400	53,500	41,200	58,300	49,900	122,000	70,900	103,000	28,000
22-----	28,800	139,000	42,000	43,600	52,600	52,600	51,700	45,400	148,000	67,600	97,600	29,800
23-----	26,100	146,000	42,000	44,500	54,400	70,300	54,400	42,000	161,000	66,500	84,300	31,100
24-----	25,300	165,000	39,900	46,300	56,300	76,000	71,200	39,900	165,000	61,300	69,100	34,300
25-----	23,500	185,000	37,800	45,400	56,300	73,700	75,700	37,600	164,000	55,600	57,300	36,400
26-----	21,800	210,000	34,600	51,700	56,300	77,300	75,700	39,700	164,000	54,700	49,800	36,400
27-----	21,300	242,000	32,700	55,300	58,300	83,300	76,900	39,000	154,000	54,700	43,600	37,800
28-----	22,800	262,000	32,700	50,800	55,300	80,900	70,100	37,600	134,000	53,800	44,500	38,500
29-----	22,800	265,000	33,300	46,300	49,000	79,300	62,400	37,600	127,000	52,900	46,300	37,800
30-----	23,900	242,000	34,600	42,800	-----	85,300	57,300	42,000	136,000	51,100	40,400	34,300
31-----	26,300	-----	34,900	40,300	-----	97,200	-----	72,300	-----	47,500	38,300	-----

Month	Maximum	Minimum	Mean	Fun-off in acre-feet
October-----	75,100	19,700	36,500	2,240,000
November-----	265,000	19,900	94,200	5,610,000
December-----	194,000	32,700	59,800	3,680,000
January-----	141,000	39,700	66,100	4,060,000
February-----	58,300	34,900	47,300	2,720,000
March-----	110,000	25,300	65,400	4,020,000
April-----	100,000	47,200	68,300	4,060,000
May-----	104,000	37,600	60,800	3,740,000
June-----	165,000	90,000	124,000	7,380,000
July-----	166,000	47,500	98,900	6,080,000
August-----	105,000	38,300	63,000	3,870,000
September-----	45,400	28,000	34,800	2,070,000
The year-----	265,000	19,700	68,200	49,500,000

## MISSOURI RIVER AT HERMANN, MO.

LOCATION.—Wire gage until Mar. 27 and water-stage recorder thereafter 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 1932.

EXTREMES.—Maximum discharge during year, 269,000 second-feet Nov. 29 (gage height, 20.9 feet); minimum, 20,000 second-feet Nov. 10, 11 (gage height, 1.7 feet).

1928-32: Maximum discharge, 407,000 second-feet June 8, 1929 (gage height, 24.6 feet); minimum discharge, 15,000 second-feet Dec. 25-28, 1929; minimum gage height, 0.9 foot Dec. 31, 1930, Jan. 1, 2, Sept. 22, 1931.

Maximum stage known, 35.7 feet in June 1844.

REMARKS.—Records good.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60,000	26,500	229,000	68,000	44,800	51,100	97,400	57,600	79,800	151,000	46,100	39,600
2	50,800	25,500	187,000	67,000	42,400	57,700	79,800	54,100	94,800	144,000	44,800	39,100
3	43,600	24,500	146,000	81,000	42,400	69,000	68,000	50,200	102,000	125,000	44,800	38,500
4	34,800	23,500	108,000	102,000	43,000	90,900	64,300	47,300	100,000	111,000	51,800	38,500
5	29,700	23,000	89,300	126,000	42,400	90,900	71,000	46,700	103,000	103,000	61,000	42,000
6	25,800	22,000	69,300	155,000	43,000	88,300	81,000	52,500	126,000	107,000	64,300	45,100
7	22,800	21,500	55,500	146,000	43,000	89,600	72,000	59,300	148,000	129,000	61,000	46,200
8	22,300	21,000	49,600	130,000	40,100	98,700	62,600	63,400	152,000	155,000	54,600	46,800
9	22,300	21,500	49,000	114,000	37,900	110,000	58,500	77,400	143,000	174,000	54,600	43,700
10	23,700	20,500	46,100	94,800	41,400	94,300	53,900	85,800	120,000	172,000	59,300	40,100
11	31,500	20,500	45,400	73,000	48,800	64,800	53,200	98,700	104,000	170,000	59,300	38,300
12	38,300	22,500	45,400	56,100	51,500	48,400	67,000	102,000	102,000	161,000	55,400	36,500
13	45,500	22,500	49,200	51,100	48,800	38,500	93,500	91,900	105,000	146,000	59,300	34,200
14	64,800	25,000	56,900	47,300	47,500	33,300	102,000	77,300	108,000	130,000	60,200	33,100
15	76,300	32,500	64,300	47,300	46,900	29,500	103,000	74,300	114,000	120,000	59,300	31,300
16	73,000	36,500	70,000	52,500	46,900	32,200	93,500	84,500	116,000	114,000	61,800	30,200
17	69,700	47,300	69,000	67,000	56,700	32,200	77,400	85,700	110,000	102,000	93,500	30,200
18	64,200	77,400	61,800	65,200	59,200	33,900	65,200	67,500	95,500	88,400	100,000	29,100
19	52,000	99,400	56,100	58,500	57,500	41,500	58,500	60,800	90,300	80,000	98,700	28,600
20	44,800	120,000	50,500	58,500	57,500	44,400	58,500	56,900	93,500	78,000	102,000	28,600
21	39,400	141,000	47,300	56,900	55,900	43,800	61,800	52,800	107,000	74,000	103,000	28,000
22	35,400	137,000	50,400	53,200	55,100	47,400	57,700	48,100	135,000	70,100	98,700	29,100
23	32,000	46,000	45,400	53,200	55,100	63,000	54,600	45,000	157,000	69,200	89,600	30,200
24	28,600	162,000	43,000	55,400	58,500	74,000	63,400	43,200	168,000	65,000	73,000	33,600
25	26,400	181,000	40,600	56,900	59,300	75,000	74,000	41,500	172,000	59,400	61,000	36,000
26	24,200	204,000	39,500	60,200	57,700	74,000	75,000	40,900	166,000	57,200	53,200	37,100
27	23,700	229,000	37,100	67,000	57,700	81,400	77,000	41,500	155,000	57,900	46,700	37,700
28	23,700	255,000	35,400	61,800	58,500	83,800	75,000	37,700	139,000	55,800	44,200	38,900
29	23,700	267,000	35,400	55,400	53,900	81,400	67,300	37,100	127,000	55,100	46,100	38,900
30	23,700	263,000	38,900	51,800	-----	78,600	62,300	39,500	135,000	53,800	43,600	36,500
31	25,800	-----	43,600	48,500	-----	93,500	-----	49,800	-----	49,900	40,600	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	76,300	22,300	38,800	2,390,000
November	267,000	20,500	90,600	5,390,000
December	229,000	35,400	66,100	4,060,000
January	155,000	47,300	73,800	4,530,000
February	59,300	37,900	50,100	2,880,000
March	110,000	29,500	65,600	4,030,000
April	103,000	53,200	71,600	4,260,000
May	102,000	37,100	60,400	3,710,000
June	172,000	79,800	122,000	7,260,000
July	174,000	49,900	104,000	6,390,000
August	103,000	40,600	64,200	3,950,000
September	46,800	28,000	36,200	2,150,000
The year	267,000	20,500	70,300	51,000,000

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 322 second-feet June 7 (gage height, 6.06 feet); minimum, 1.2 second-feet Aug. 24–25 (gage height, 4.14 feet). 1921–32: Maximum discharge, 557 second-feet June 5, 1925 (gage height, 6.52 feet); no flow July 5–11, Aug. 3, 1930, Aug. 5–6, 1931. Water diverted for irrigation.

REMARKS.—Records good except those estimated Nov. 11–17, Mar. 6–13, which are poor. No records Nov. 18 to Feb. 28. Numerous small diversions above gage.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	* 11		78	70	19	45	24	24	10
2	8.5	* 11		49	74	17	33	16	23	10
3	7.9	11		21	66	17	35	15	20	9.7
4	8.5	12		29	45	22	42	12	18	9.3
5	* 9.1	12		29	42	25	45	12	16	8.9
6	* 9.7	13			35	22	309	11	16	8.2
7	* 10	13			35	18	322	10	15	8.2
8	* 11	* 13			33	16	207	10	15	9.3
9	11	14			35	16	158	6.7	14	8.5
10	* 11	7		24	42	15	148	6.7	12	7.9
11	* 10				38	15	134	12	12	9.7
12	* 10				59	31	158	21	11	8.2
13	9.7				59	52	134	15	8.9	9.7
14	11			18	45	70	90	24	7.0	9.3
15	10	5		19	42	86	120	35	5.8	8.5
16	10			22	33	70	134	29	9.7	8.5
17	9.7			24	35	33	194	24	6.4	9.3
18	* 9.7			24	33	29	182	19	6.1	10
19	9.7			35	33	29	* 166	257	6.1	9.7
20	9.7			* 35	25	29	* 150	283	4.5	10
21	9.3			35	22	27	* 134	134	3.0	10
22	9.3			45	21	56	* 119	66	2.4	11
23	9.3			45	21	59	* 104	49	1.6	13
24	9.3			35	18	59	* 89	45	1.2	14
25	9.3			31	17	42	* 74	38	1.2	11
26	9.7			27	16	33	59	31	1.8	13
27	9.7			* 31	15	63	52	25	2.2	14
28	9.7			35	15	86	45	24	2.2	14
29	9.7			31	15	70	31	25	27	14
30	10			29	21	59	24	38	14	15
31	10			42		52		27	12	

Month	Maximum	Minimum	Mean	R n-off in acre-feet
October	11	7.9	9.76	600
November 1–17	14		8.94	301
March	78	18	31.0	1,910
April	74	15	35.3	2,100
May	86	15	39.9	2,450
June	322	24	118	7,020
July	283	6.7	43.4	2,670
August	27	1.2	10.3	633
September	15	7.9	10.4	619

\* Interpolated.

## RUBY RIVER BASIN

## RUBY RIVER NEAR ALDER, MONT.

LOCATION.—Staff gage in SW¼ sec. 21, T. 6 S., R. 4 W., 1,000 feet below highway bridge 1½ miles south of Alder.

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 512 second-feet May 20, 22 (gage height, 2.60 feet); minimum, 6.0 second-feet Aug. 3-7.

1929-32: Maximum discharge, 745 second-feet May 25, 1929 (gage height, 3.55 feet); minimum, 5 second-feet Aug. 30, 1929 (gage height, 0.50 foot).

REMARKS.—Records fair. Discharge not computed for period of ice effect, Nov. 22 to Mar. 15. Numerous diversions. No storage.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	30	-----	94	88	157	70	12	36
2	28	22	-----	104	96	137	48	9.6	32
3	25	21	-----	104	100	142	38	6.0	41
4	21	27	-----	101	132	127	33	6.0	41
5	21	42	-----	104	147	223	40	6.0	44
6	21	46	-----	87	137	269	30	6.0	44
7	20	46	-----	90	179	254	26	6.0	49
8	17	44	-----	87	179	238	26	6.6	46
9	14	56	-----	81	208	238	18	7.8	46
10	7.8	53	-----	84	238	223	15	13	60
11	7.4	66	-----	81	269	208	18	46	46
12	12	48	-----	87	318	238	104	24	46
13	13	53	-----	94	403	254	104	18	46
14	14	69	-----	112	457	269	100	18	34
15	15	75	-----	104	386	209	67	16	34
16	18	78	97	104	301	318	40	11	35
17	11	78	97	115	318	307	28	13	35
18	11	91	97	108	334	318	18	17	35
19	11	58	104	112	403	269	19	16	35
20	20	64	108	123	512	254	40	18	23
21	12	42	97	115	457	223	35	17	23
22	11	-----	94	112	512	223	18	17	26
23	11	-----	90	104	368	223	21	14	48
24	11	-----	94	104	269	174	26	17	48
25	13	-----	94	104	238	194	15	16	53
26	20	-----	94	108	208	179	12	24	61
27	20	-----	84	104	166	152	11	24	48
28	31	-----	84	96	132	127	11	46	48
29	30	-----	84	100	152	84	12	116	45
30	26	-----	87	88	179	74	11	106	45
31	27	-----	87	-----	174	-----	15	34	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	31	7.4	17.6	1,080
November 1-21	81	21	52.2	2,170
March 16-31	108	84	93.2	2,960
April	123	81	100	5,950
May	512	88	260	16,000
June	318	74	212	12,600
July	104	11	34.5	2,120
August	116	6.0	22.8	1,400
September	61	23	41.8	2,490



## 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 1932 at present site. Comparable records 1½ miles upstream March 1924 to September 1931.

EXTREMES.—Maximum discharge during year, 6,290 second-feet June 17 (gauge height, 4.88 feet); minimum, 227 second-feet Nov. 12 (gauge height, 1.22 feet). 1924-32: Maximum discharge, 9,230 second-feet May 26-27, 1928 (gauge height, 7.60 feet, old site); minimum, 49 second-feet Aug. 17, 1931 (gauge 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 prior to June 8, which are fair. Discharge not computed for period of ice effect, Nov. 21 to Mar. 19. Several diversions above station. Flow partly regulated by power plant operation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	243	287	-----	386	825	3,180	1,900	712	346
2	246	280	-----	440	956	2,960	1,660	652	342
3	246	287	-----	550	1,070	2,960	1,550	616	335
4	232	286	-----	754	1,280	2,960	1,480	572	320
5	236	284	-----	1,040	1,400	3,650	1,400	535	306
6	241	280	-----	970	1,470	4,370	1,300	492	296
7	246	284	-----	850	1,500	5,570	1,160	466	293
8	246	284	-----	733	1,500	5,930	1,030	429	300
9	249	280	-----	680	1,600	5,330	928	424	290
10	249	268	-----	625	1,760	4,970	862	413	280
11	249	260	-----	634	2,220	4,730	850	408	268
12	246	232	-----	900	2,650	4,610	1,100	424	260
13	249	246	-----	1,160	2,960	4,730	1,280	418	254
14	257	246	-----	1,370	3,770	4,610	1,440	382	246
15	254	266	-----	1,340	3,890	4,970	1,500	368	244
16	257	280	-----	1,250	3,770	5,690	1,320	351	236
17	257	274	-----	1,250	3,410	5,930	1,160	335	241
18	257	263	-----	1,310	3,650	5,690	1,080	320	241
19	260	252	-----	1,100	3,890	5,930	1,310	300	239
20	260	263	342	1,010	4,010	5,090	2,230	280	239
21	260	-----	321	928	4,970	4,490	2,650	263	254
22	260	-----	300	800	5,810	4,250	2,960	254	274
23	260	-----	321	775	5,090	4,010	2,180	244	277
24	280	-----	342	800	4,490	3,890	1,580	236	280
25	280	-----	321	800	3,770	3,770	1,340	234	287
26	280	-----	300	800	3,180	3,530	1,180	232	290
27	286	-----	320	800	3,180	3,070	1,010	239	287
28	293	-----	327	800	3,300	2,750	914	254	287
29	286	-----	334	800	3,770	2,420	862	287	287
30	280	-----	342	800	4,130	2,160	850	324	293
31	284	-----	364	-----	3,890	-----	800	338	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	293	232	261	16,000
November 1-20	287	232	270	10,700
March 20-31	364	300	328	7,810
April	1,370	386	882	62,500
May	5,810	825	3,010	185,000
June	5,930	2,160	4,270	254,000
July	2,960	800	1,880	84,800
August	712	232	381	23,400
September	346	236	280	16,700

## SOUTH BOULDER CREEK BASIN

## SOUTH BOULDER CREEK NEAR JEFFERSON ISLAND, MONT.

LOCATION.—Staff gage in sec. 18, T. 2 S., R. 3 W., about 200 feet above head-works of Liberty-Montana Mines Co. and 16 miles southwest of Jefferson Island. Prior to Oct. 1, 1931, water-stage recorder at same location but independent datum was used.

RECORDS AVAILABLE.—May 1926 to September 1932.

EXTREMES.—Maximum discharge during year, 135 second-feet June 18–22, 24; minimum, 6.4 second-feet Mar. 21–22.

1926–32: Maximum discharge, 434 second-feet June 16, 1929 (gage height, 3.50 feet, old gage); minimum, 2.0 second-feet Apr. 12, 1929 (gage height, 0.90 foot, old gage).

REMARKS.—Records good except those estimated for period of ice effect, Nov. 21 to Mar. 19, which are fair. No diversions.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	32	17	15	9	8	9	7.0	11	45	104	45	24
2.....	29	18					7.0	11	38	94	45	24
3.....	23	18					7.0	11	38	94	45	24
4.....	23	18					7.0	11	45	94	38	24
5.....	23	18					7.0	11	68	85	38	23
6.....	22	18	12	10	8	6.5	7.0	11	60	85	38	23
7.....	20	18					7.0	11	60	85	38	23
8.....	20	18					7.0	20	68	85	38	23
9.....	18	18					7.0	20	68	85	38	22
10.....	18	18					7.0	32	68	76	38	22
11.....	18	18	15	10	9	12	7.0	45	76	76	38	22
12.....	19	18					7.5	52	76	76	32	22
13.....	20	18					7.5	68	85	76	32	21
14.....	20	18					7.5	76	94	68	32	18
15.....	20	18					9.2	85	104	68	32	18
16.....	20	18	10	9	12	7.0	9.2	85	114	68	32	18
17.....	20	18					9.2	85	124	68	32	18
18.....	20	18					9.2	94	135	60	31	18
19.....	19	18					9.2	94	135	60	31	17
20.....	18	18					6.4	9.2	85	135	60	31
21.....	18	15	10	9	12	6.4	11	85	135	60	31	16
22.....	18					7.0	11	85	135	52	30	16
23.....	18					7.0	11	76	124	52	30	16
24.....	18					7.0	11	68	135	52	27	16
25.....	18					7.0	11	60	124	52	27	16
26.....	18	17	17	17	17	7.0	11	60	124	52	26	16
27.....	18					7.0	11	52	114	45	26	15
28.....	17					7.0	11	52	114	45	25	15
29.....	17					7.0	11	52	104	45	25	15
30.....	17					7.0	11	52	104	45	25	14
31.....	17					7.0	45		45		25	14

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	32	17	19.9	1,220
November.....	18		17.0	1,010
December.....			12.3	756
January.....			9.3	572
February.....			9.2	529
March.....			7.46	459
April.....	11	7.0	8.82	524
May.....	94	11	51.8	3,190
June.....	135	38	95.0	5,650
July.....	104	45	68.1	4,190
August.....	45	25	32.6	2,000
September.....	24	14	19.2	1,140
The year.....	135		29.3	21,200

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 192 second-feet June 16 (gage height, 3.16 feet); minimum, 5.8 second-feet May 26 (gage height, 1.24 feet).

1919-32: Maximum discharge, 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 fair except those for periods of ice effect, Nov. 20, 21, 23-30, Mar. 7, 9-21, which are poor. No record Dec. 1 to Feb. 29. Numerous small diversions above and below station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	17	41	29	9.0	19	40	15	12
2	20	24	34	24	16	21	50	15	11
3	21	23	20	23	14	22	54	14	11
4	16	23	25	21	16	24	38	13	8.4
5	16	24	29	22	15	49	32	12	8.4
6	16	23	20	18	14	58	31	9	8.4
7	17	22	19	16	14	31	33	10	8.4
8	16	24	18	16	10	30	35	10	7.2
9	16	25	13	13	10	34	31	11	6.6
10	15	24	13	13	9.0	34	32	11	7.2
11	14	24	13	9.8	37	31	10	7.2	
12	15	31	12	7.6	37	56	11	7.2	
13	24	38	14	8.3	46	37	11	7.2	
14	24	29	16	29	56	47	9.0	7.2	
15	22	24	18	29	73	31	9.0	6.6	
16	22	30	15	25	192	26	9.7	7.8	
17	20	34	15	21	162	26	12	7.8	
18	22	32	13	13	147	37	10	7.8	
19	20	16	9.8	9.0	119	60	11	9.0	
20	20	16	14	7.6	106	45	10	10.0	
21	20	16	17	8.3	106	32	11	9.7	
22	21	16	21	27	106	31	12	9.7	
23	22	21	29	21	133	24	10	9.7	
24	20	31	31	22	9.0	126	22	7.8	9.7
25	20	29	21	6.4	119	19	7.2	9.7	
26	21	12	27	14	5.8	106	17	7.2	10.0
27	18	26	15	27	81	12	9.7	9.7	
28	19	27	15	21	68	12	11	9.0	
29	19	30	15	24	48	10	14	9.0	
30	18	27	12	25	48	10	20	9.0	
31	17	26	-----	17	-----	20	13	-----	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	24	14	19.2	1,180
November	38	-----	21.0	1,250
March	41	-----	19.9	1,220
April	29	9.8	17.2	1,020
May	29	5.8	15.4	947
June	192	19	74.6	4,440
July	60	10	31.6	1,940
August	20	7.2	11.1	682
September	12	6.6	8.72	519

## 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 1932.

EXTREMES.—Maximum discharge during year, 1,450 second-feet May 22 (gage height, 2.82 feet); minimum, 266 second-feet Jan. 5 (gage height, 1.63 feet). 1913-32: Maximum discharge, 1,950 second-feet June 10, 1917; minimum, that of Aug. 7-12, 1931, Jan. 5, 1932.

REMARKS.—Records excellent except those for November to March and September, which are good, and those estimated, which are fair. No diversions or regulation.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	287	b 298	b 305	a 307		322	b 370	365	690	492	346	328
2	287	b 297	b 302	309		322	379	408	741	484	340	328
3	287	b 296	b 300	303		322	386	436	741	468	334	346
4	287	b 294	298	a 295		315	365	508	762	452	328	328
5	287	b 293	292	287		315	353	508	793	444	322	315
6	322	b 292	292	a 300		315	340	500	814	415	322	315
7	309	292	292	315		309	322	500	772	400	328	309
8	298	b 291	298	315		303	328	500	936	386	322	309
9	292	b 290	303	315		292	315	542	948	379	322	303
10	292	b 289	298	b 311	a 300	303	309	586	803	379	328	303
11	292	b 288	303	b 307		292	322	652	741	415	334	303
12	292	287	303	303		328	353	690	814	492	328	303
13	287	292		292		328	365	752	762	422	322	309
14	287	298				b 331	415	902	752	484	315	309
15	287		a 300	a 300		b 334	408	1,070	793	422	315	309
16	287					b 337	393	793	960	386	315	309
17	287					340	452	782	1,030	372	315	309
18	287			322		b 334	436	880	847	372	315	309
19	287		303	322		328	415	902	772	379	315	309
20	287	a 300	b 299	315	303	322	429	1,030	721	359	322	315
21	287		b 296	309	298	309	422	1,170	690	353	315	328
22	292		292	309	298	309	400	1,310	681	353	315	b 340
23	359		b 300	292	298	315	393	1,090	690	353	309	b 352
24	315		b 307		303	322	372	902	681	372	303	365
25	303		b 314		303	322	359	836	671	359	309	b 362
26	346		322		303	315	372	772	633	346	309	b 360
27	315		b 328	a 300	309	b 324	372	721	642	346	315	b 357
28	298	303	334		322	b 333	372	681	623	365	322	b 354
29	298	309	322		340	b 342	346	700	560	372	353	b 351
30	292	b 307	303			b 352	340	762	525	359	359	b 349
31	298		a 305			b 361		741		353	346	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	359	287	298	0.711	0.82	18,300
November		287	297	.709	.79	17,700
December	334	292	304	.726	.84	18,700
January		287	304	.726	.84	18,700
February	340	298	303	.723	.78	17,400
March	361	292	322	.768	.89	19,800
April	452	309	373	.890	.99	22,200
May	1,310	365	742	1.77	2.04	45,600
June	1,030	525	753	1.80	2.01	44,800
July	492	346	398	.950	1.10	24,500
August	359	303	324	.773	.89	19,900
September	365	303	326	.778	.87	19,400
The year	1,310	287	395	.943	12.86	287,000

a Estimated.  
b Interpolated.

## MADISON RIVER AT LYON, MONT.

LOCATION.—Staff gage in SE¼ sec. 29, T. 10 S., R. 1 E., at highway bridge at Lyon.

RECORDS AVAILABLE.—August 1928 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 2,700 second-feet June 25 (gage height, 2.10 feet); minimum, 515 second-feet Dec. 17–19 (gage height, 0.70 foot).

1928–32: Maximum discharge, 3,360 second-feet Aug. 13–14, 1929 (gage height, 2.40 feet); minimum, 255 second-feet Mar. 24, 26–31, 1929 (gage height, 0.20 foot).

REMARKS.—Records good. Discharge interpolated May 13, 15. No diversions. Complete regulation at Hebgen Reservoir.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,320	1,160	1,640	815	815	815	700	1,320	1,160	1,720	880	758
2.....	1,240	1,240	1,720	815	815	815	700	2,090	1,470	1,640	880	758
3.....	1,240	1,240	1,720	815	815	815	700	2,190	1,810	1,550	815	758
4.....	1,240	1,240	1,720	815	815	815	700	2,190	2,390	1,390	815	758
5.....	1,320	1,240	1,720	815	815	815	700	1,810	1,390	1,390	815	758
6.....	1,320	1,240	1,720	815	815	815	700	1,320	1,390	1,390	815	758
7.....	1,320	1,240	1,720	815	815	815	700	1,240	1,390	1,550	758	-----
8.....	1,320	1,240	1,720	815	815	815	700	1,390	1,390	1,550	700	-----
9.....	1,320	1,240	1,550	815	815	815	700	1,550	1,390	1,390	700	-----
10.....	1,320	1,320	1,470	815	815	815	700	1,640	1,390	1,390	700	-----
11.....	1,320	1,320	1,390	815	815	815	700	1,810	1,240	1,390	700	-----
12.....	1,320	1,550	1,390	815	815	815	700	1,900	1,160	1,550	700	-----
13.....	1,320	1,720	1,390	815	815	700	700	1,900	1,320	1,640	700	-----
14.....	1,320	1,810	945	815	815	700	700	1,900	1,390	1,720	700	-----
15.....	1,320	1,810	600	815	815	700	700	2,090	1,810	1,720	700	-----
16.....	1,240	1,810	515	815	815	700	700	2,090	2,290	1,640	700	-----
17.....	1,240	1,810	515	815	815	700	700	2,090	2,290	1,390	700	-----
18.....	1,320	1,810	515	815	815	700	700	2,190	2,290	1,240	700	-----
19.....	1,320	1,810	515	815	815	700	700	2,190	2,290	1,090	700	-----
20.....	1,240	1,810	650	815	815	700	700	1,900	2,290	1,090	700	-----
21.....	1,320	1,810	1,240	815	945	700	700	1,390	2,290	1,090	700	-----
22.....	1,320	1,810	1,240	815	945	700	700	1,160	2,490	945	700	-----
23.....	1,320	1,720	1,240	815	945	700	700	1,090	2,490	945	700	-----
24.....	1,320	1,550	1,090	815	1,090	700	700	1,090	2,490	945	700	-----
25.....	1,320	1,390	1,090	815	1,090	700	700	758	2,600	945	1,020	-----
26.....	1,320	1,240	815	815	1,090	700	700	700	2,490	945	1,320	-----
27.....	1,240	1,160	700	815	1,090	700	758	700	2,290	945	700	-----
28.....	1,240	1,160	700	815	945	700	880	700	2,090	945	700	-----
29.....	1,240	1,240	700	815	945	700	945	700	2,090	945	700	-----
30.....	1,240	1,390	700	815	-----	700	1,090	700	1,810	945	700	-----
31.....	1,240	-----	700	815	-----	700	-----	700	-----	945	700	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,320	1,240	1,290	79,300
November.....	1,810	1,160	1,470	87,500
December.....	1,720	515	1,140	70,100
January.....	815	815	815	50,100
February.....	1,090	815	875	50,300
March.....	815	700	745	45,800
April.....	1,090	700	729	43,400
May.....	2,190	700	1,500	92,200
June.....	2,600	1,160	1,890	112,000
July.....	1,720	945	1,290	79,300
August.....	1,320	700	759	46,700
September 1–6.....	758	758	758	9,200
The period.....	-----	-----	-----	966,000

## MADISON RIVER NEAR THREE FORKS, MONT.

LOCATION.—Wire gage in sec. 29, T. 2 N., R. 2 E., at highway bridge 1½ miles east of Three Forks.

RECORDS AVAILABLE.—November 1928 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 3,600 second-feet May 18-21 (gage height, 3.62 feet); minimum, 540 second-feet Aug. 10 (gage height, 1.92 feet).

1929-32: Maximum discharge, that of May 18-21, 1932; minimum, 416 second-feet Feb. 27, 1930.

REMARKS.—Records fair. Records for period of ice effect, Nov. 22 to Mar. 19, not computed. Flow regulated for power by storage in Hebgen Reservoir and by Madison River power dam. Diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,190	1,190	-----	1,090	940	1,190	1,980	990	1,190
2	1,190	1,190	-----	1,090	580	1,190	1,780	1,040	1,190
3	1,240	1,140	-----	1,190	580	1,140	1,470	990	1,090
4	1,090	1,040	-----	1,410	580	1,140	1,470	990	990
5	990	1,190	-----	1,470	620	1,300	1,470	940	890
6	1,040	1,300	-----	1,610	620	1,350	1,470	940	795
7	1,190	1,240	-----	1,540	660	1,470	1,470	890	795
8	1,300	1,350	-----	1,300	660	1,470	1,350	795	795
9	1,240	1,350	-----	1,140	1,300	1,470	1,350	705	795
10	1,240	1,350	-----	1,090	1,300	1,410	1,300	540	840
11	1,240	1,350	-----	1,090	1,300	1,350	1,350	705	840
12	1,300	1,350	-----	1,140	1,300	1,350	1,470	840	890
13	1,300	1,350	-----	1,040	1,350	1,410	1,610	840	1,040
14	1,350	1,350	-----	990	2,320	1,470	1,610	795	1,190
15	1,300	1,350	-----	940	2,320	1,610	1,610	840	1,190
16	1,240	1,350	-----	940	1,980	1,980	1,610	840	1,240
17	1,240	1,350	-----	1,040	2,700	3,280	1,610	840	1,240
18	1,300	1,350	-----	1,140	3,600	3,280	1,540	840	1,240
19	1,300	1,350	-----	1,700	3,600	3,280	1,410	840	1,140
20	1,300	1,350	1,240	1,700	3,600	3,280	1,300	795	1,090
21	1,240	1,350	1,190	2,840	3,600	3,280	1,240	795	1,040
22	1,190	-----	1,090	2,570	3,130	3,280	1,140	840	990
23	1,190	-----	1,090	2,840	2,700	3,280	1,040	840	940
24	1,190	-----	1,090	1,700	1,880	2,980	1,140	940	940
25	1,240	-----	1,090	1,540	1,540	1,980	1,140	1,190	940
26	1,350	-----	1,040	1,300	1,300	3,280	1,090	1,190	940
27	1,350	-----	990	1,190	1,190	3,130	1,090	1,300	940
28	1,300	-----	990	1,190	1,190	2,980	1,040	1,350	940
29	1,300	-----	990	1,140	1,190	2,700	1,140	1,300	940
30	1,240	-----	1,040	1,040	1,190	2,200	1,140	1,190	940
31	1,190	-----	1,040	-----	1,190	-----	990	1,240	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,350	990	1,240	76,200
November 1-21	1,350	1,040	1,290	53,700
March 20-31	1,240	990	1,070	25,500
April	2,840	940	1,400	83,300
May	3,600	580	1,680	103,000
June	3,280	1,140	2,150	128,000
July	1,980	990	1,370	84,200
August	1,350	540	941	57,900
September	1,240	795	1,000	59,500

## GALLATIN RIVER BASIN

## GALLATIN RIVER NEAR GALLATIN GATEWAY, MONT.

LOCATION.—Wire gage in SE¼ sec. 7, T. 4 S., R. 4 E., about three quarters of a mile below mouth of Spanish Creek and 8 miles south of Gallatin Gateway. Gage moved 1,000 feet upstream and set at new datum Nov. 4.

RECORDS AVAILABLE.—June 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 5,780 second-feet June 16 (gage height, 4.60 feet); minimum, 174 second-feet Nov. 22 (gage height, 0.34 foot).

1930-32: Maximum discharge, that of June 16, 1932; minimum, that of Nov. 22, 1931.

REMARKS.—Records good except those for Nov. 1 to Mar. 31, which are poor. Discharge estimated for periods of ice effect, Feb. 1-9, Mar. 13. One small diversion between old and new locations does not affect comparability of records.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	289	230	305	257	280	272	380	341	1,710	2,350	635	470
2-----	257	* 280	305	257		* 257	305	402	1,860	2,180	605	* 470
3-----	244	* 330	305	257		242	305	423	1,780	2,020	605	470
4-----	244	380	* 305	* 264		272	272	495	2,020	1,710	605	446
5-----	244	380	305	272		272	288	548	3,480	1,640	575	423
6-----	244	* 370	305	280	288	257	272	575	3,480	1,380	520	423
7-----	244	360	* 296	* 288		257	288	635	3,080	1,320	520	423
8-----	244	* 350	288	288		* 257	288	735	3,480	1,260	520	423
9-----	244	* 341	* 288	288		257	272	808	3,280	1,260	520	423
10-----	244	* 332	288	288		* 272	257	1,060	2,890	1,160	520	423
11-----	244	* 323	288	288	* 280	288	305	1,260	3,080	1,160	520	423
12-----	244	* 314	272	* 258	272	305	341	2,020	3,280	1,710	495	402
13-----	244	305	257	228	* 257	* 288	360	2,890	3,690	1,500	495	402
14-----	244	* 317	* 250	* 250	242	272	423	3,280	4,330	1,440	470	402
15-----	230	* 329	242	272	* 257	272	402	2,890	5,280	1,060	470	402
16-----	230	341	288	272	272	* 257	423	2,180	5,780	1,020	470	380
17-----	230	* 314	* 306	288	* 272	242	470	2,020	5,040	1,020	470	380
18-----	230	288	323	* 288	272	* 257	423	2,520	4,110	1,020	446	380
19-----	230	288	323	288	* 272	272	* 434	3,480	5,040	970	446	380
20-----	230	272	305	* 288	272	272	446	3,690	5,040	885	446	423
21-----	230	174	* 305	288	* 272	272	402	4,560	4,110	845	423	423
22-----	230	174	305	* 288	272	272	380	4,560	4,800	808	423	402
23-----	230	257	305	288	272	* 257	380	3,280	5,280	770	423	402
24-----	230	305	288	257	272	257	360	2,520	5,040	770	423	402
25-----	230	* 305	288	242	272	257	341	2,180	4,800	700	423	402
26-----	230	305	288	* 257	305	257	360	1,860	4,560	700	423	402
27-----	230	323	288	272	305	257	360	1,500	3,900	700	402	380
28-----	230	323	288	* 272	288	257	341	1,320	3,900	672	446	380
29-----	230	305	288	272	288	272	341	1,440	3,480	672	575	380
30-----	230	305	272	* 272	-----	272	341	1,860	2,700	672	605	380
31-----	230	-----	257	272	-----	257	-----	1,780	-----	672	495	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	289	230	238	14,600
November-----	380	174	307	18,300
December-----	323	242	291	17,900
January-----	288	228	272	16,700
February-----	305	242	277	15,900
March-----	305	242	265	16,300
April-----	470	257	352	20,900
May-----	4,560	341	1,910	117,000
June-----	5,780	1,710	3,810	227,000
July-----	2,350	672	1,160	71,300
August-----	635	402	497	30,600
September-----	470	380	411	24,500
The year-----	5,780	174	814	591,000

\* Interpolated.

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 4,570 second-feet June 16 (gage height, 6.42 feet); minimum, 265 second-feet Aug. 4-10 (gage height, 2.54-2.56 feet).

1928-32: Maximum discharge, 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 excellent except those estimated for period of ice effect, Nov. 23 to Mar. 20, which are fair. Numerous diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	415	415					828	725	905	*1,590	285	460
2.....	415	415					828	725	828	1,310	285	*460
3.....	392	415					790	790	758	1,210	285	460
4.....	370	415					725	865	790	1,160	265	*460
5.....	*381	415					695	945	1,310	665	265	460
6.....	392	438	380	280	340	530	665	945	1,630	665	265	460
7.....	415	438					665	1,030	1,520	610	265	448
8.....	392	438					638	1,080	1,630	610	265	460
9.....	392	485					610	1,080	2,820	638	265	415
10.....	392	510					610	1,410	2,820	485	265	438
11.....	392	510					610	1,630	3,130	560	*275	438
12.....	370	485					638	1,870	*3,130	535	285	415
13.....	392	510					665	2,250	3,130	535	285	438
14.....	392	560					638	2,820	3,290	560	285	438
15.....	*404	560	335	360	305	470	*647	3,290	3,810	560	285	438
16.....	415	638					*656	2,670	4,570	460	285	415
17.....	415	638					665	2,250	4,180	438	305	415
18.....	392	610					665	2,390	3,810	415	285	460
19.....	392	610					*765	2,970	3,460	695	285	415
20.....	415	*598					865	2,970	3,460	665	285	460
21.....	415	585				758	905	3,130	3,290	610	*285	460
22.....	392	485				725	905	3,990	3,290	585	285	460
23.....	415					638	988	3,290	3,460	*535	285	460
24.....	*415					665	945	2,530	3,460	485	305	460
25.....	415					695	865	1,990	3,460	460	305	460
26.....	460	495	410	290	640	665	828	*1,930	3,290	392	285	460
27.....	460					638	790	1,870	2,820	370	305	460
28.....	415					638	790	1,990	2,390	348	325	460
29.....	415					725	725	*1,470	1,990	325	370	460
30.....	415					665	725	945	1,870	285	485	485
31.....	415					638		945		285	485	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	460	370	405	24,900
November.....	638		504	30,000
December.....			376	23,100
January.....			309	19,000
February.....			421	24,200
March.....	758		563	34,600
April.....	988	610	744	44,300
May.....	3,990	725	1,900	117,000
June.....	4,570	758	2,680	159,000
July.....	1,590	285	614	37,800
August.....	485	265	300	18,400
September.....	485	415	449	26,700
The year.....	4,570	265	770	559,000

\* Interpolated.



## PRICKLY PEAR CREEK BASIN

## PRICKLY PEAR CREEK NEAR CLANCY, MONT.

LOCATION.—Staff gage in 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 September 1932. July 1908 to June 1909 comparable record at site 1 mile downstream.

EXTREMES.—Maximum discharge recorded during year, 260 second-feet June 9 (gage height, 2.56 feet); minimum, 8.7 second-feet Oct. 12 (gage height, 6.62 feet).

1909-16, 1921-32: Maximum discharge, 492 second-feet June 3, 1927 (gage height, 3.8 feet); minimum, 4.1 second-feet Aug. 12, 1931 (gage height, 0.49 foot).

REMARKS.—Records good except those estimated for periods of ice effect, which are fair. Stage-discharge relation affected by ice Nov. 21 to Dec. 19, Dec. 30 to Feb. 29, Mar. 3-14, 16, 18-20. Discharge not computed Jan. 1 to Feb. 29. Numerous diversions above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	21	12.5	12	16	23	24	65	39	23	22
2.....	17	12.5		13	25	21	55	38	22	21
3.....	15	12.5			24	22	52	35	21	20
4.....	15	12.5			24	25	51	35	21	20
5.....	15	12.5			23	30	84	35	21	19
6.....	15	12.5	12		22	36	97	33	24	19
7.....	14	12.5			21	39	104	29	21	18
8.....	14	12.5			21	38	112	28	20	18
9.....	12.5	12.5		12	20	39	260	28	19	17
10.....	11.6	12.5			20	53	228	28	18	17
11.....	9.7	12.5	10		21	59	187	29	18	17
12.....	9.2	14			25	68	150	29	19	17
13.....	11.6	15			25	84	134	29	19	17
14.....	11.6	15			27	104	119	29	18	17
15.....	11.6	17		22	26	84	112	28	18	17
16.....	11.6	19	16	23	23	75	168	26	18	17
17.....	12.0	20		24	25	60	150	24	18	17
18.....	14.0	20		24	24	61	112	24	18	17
19.....	12.5	19		24	23	56	97	37	17	17
20.....	11.6	19		23	25	78	90	52	17	17
21.....	11.6	15	17	23	25	84	72	44	17	17
22.....	11.6		15	23	25	84	68	36	17	17
23.....	13.0		13	21	25	62	66	29	17	17
24.....	14.0		14	23	25	53	58	27	17	17
25.....	12.5		13	21	25	50	61	26	17	17
26.....	12.5	15	12.5	21	30	45	54	24	17	17
27.....	12.0		12.5	19	30	51	51	24	17	17
28.....	11.6		13	20	26	51	46	24	18	18
29.....	11.6		14	21	25	52	43	27	23	18
30.....	12.5		12	21	25	67	42	25	26	18
31.....	12.5		10	21	-----	66	-----	24	24	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	21	9.2	12.9	793
November.....	20	12.5	14.8	881
December.....	17	-----	12.0	738
March.....	24	-----	17.6	1,080
April.....	30	20	24.3	1,450
May.....	104	21	55.5	3,410
June.....	260	42	99.6	5,930
July.....	52	24	30.5	1,880
August.....	26	17	19.4	1,190
September.....	22	17	17.8	1,060

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 195 second-feet May 13 (gage height, 1.90 feet); minimum, 0.2 second-foot Sept. 8 (gage height, 0.18 foot).

1915-32: Maximum discharge, 948 second-feet May 15, 1917 (gage height, 4.87 feet); no flow at various times during 1928-29 and 1931.

REMARKS.—Records good. No records Oct. 12 to Apr. 11. Discharge estimated Apr. 28 to May 6, June 11, 12, July 21-30, Sept. 19-30. Helena city water supply diverted above station. Flow partly regulated by reservoir on tributary above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	0.4			31	7.2	1.5	0.3
2	.4			30	6.3	1.0	.3
3	.4			27	6.3	.6	.3
4	.4		15	26	6.0	.5	.3
5	.4			34	5.4	.4	.3
6	.4			36	3.9	.4	.3
7	.4		42	41	2.7	.4	.3
8	.3		49	49	1.9	.4	.3
9	.4		73	100	1.8	.4	.3
10	.4		94	88	3.3	.4	.3
11	.3		114	82	2.4	.4	.3
12		6	130	76	4.3	.5	.4
13		12	160	70	2.4	.4	.4
14		11	150	57	3.3	.4	.3
15		14	114	49	3.3	.4	.4
16		14	96	54	3.7	.4	.4
17		13	90	44	2.9	.4	.3
18		12	92	37	2.9	.4	.3
19		12	90	34	8.7	.3	
20		9.9	94	31	10.0	.8	
21		9.9	94	27		.5	
22		11	81	27		.4	
23		11	64	28	5.0	.4	
24		10	54	19		.4	
25		9.5	49	16		.4	.3
26		9.1	37	15		.4	
27		8.3	38	13		1.5	
28			39	12	3.0	2.2	
29		6.0	42	10		.5	
30			41	9.1		.5	
31			36		3.9	.4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 1-11	0.4	0.3	0.38	8.3
April 12-30	14	6.0	10.0	377
May	160		66.2	4,070
June	100	9.1	39.1	2,330
July	10	1.8	4.28	263
August	2.2	.3	.58	36
September	.4	.3	.31	18

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 140 second-feet May 14 (gage height, 1.91 feet); minimum, 0.2 second-foot at various times during ice period in January.

1908-32: Maximum discharge, 865 second-feet May 28, 1917, June 11, 1927; maximum gage height, 0.58 foot (old datum) June 11, 1927; no flow at various times.

REMARKS.—Records good except those estimated for Oct. 31 to Nov. 27 and for period of ice effect, Nov. 30 to Mar. 28, which are fair. No records Aug. 11 to Sept. 30. Diversions for irrigation and Helena city water supply above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	2.2		1.2	0.3	1.2	5.5	7.8	13	30	11.0	0.9
2	2.2		.9	.3	1.2	4.5	7.8	15	30	10.0	.9
3	2.8		.9	.2	1.2	4.2	8.5	17	28	11.0	.5
4	3.9		.9	.3	1.2	3.9	7.0	25	26	9.4	.5
5	4.2		.9	.3	1.2	3.6	6.2	31	34	8.1	.5
6	4.8		.9	.3	.9	3.4	5.5	33	37	6.2	.5
7	5.1		.9	.2	1.1	2.8	5.5	34	37	3.4	.5
8	5.1		.9	.2	1.2	2.2	4.8	45	38	3.6	.5
9	5.1		.7	.3	1.2	2.0	4.8	47	79	3.4	.5
10	5.5		.7	.2	1.2	1.8	4.2	60	108	3.4	.5
11	6.2		.3	.3	1.2	1.8	3.9	74	108	3.4	-----
12	6.6		.5		1.2	1.8	3.6	85	81	1.8	-----
13	6.6	6.5	.7		1.2	2.0	1.6	112	68	1.2	-----
14	6.2		.3		1.2	2.2	9.4	122	62	1.2	-----
15	5.9		.7	.5	1.2	2.5	6.6	97	51	1.4	-----
16	6.2		.7		1.2	2.8	3.9	72	62	1.2	-----
17	6.2		.9		1.2	2.8	6.2	64	53	1.1	-----
18	7.0		1.2	1.4	1.2	3.1	9.4	57	42	1.1	-----
19	5.9		1.2	1.4	1.2	3.1	18	62	39	3.1	-----
20	5.5		1.2	1.4	1.2	3.4	20	66	37	5.9	-----
21	5.5		1.2	1.4	1.4	3.6	20	68	31	2.0	-----
22	5.1		1.1	1.6	1.6	3.9	18	64	28	1.1	-----
23	7.4		.9	1.4	1.6	4.2	19	52	34	1.1	-----
24	8.1		.7	1.6	2.0	4.8	19	47	29	.9	-----
25	7.8		.7	1.4	2.5	5.9	20	44	23	.9	-----
26	7.8		.5	1.6	3.9	7.8	19	40	19	.7	-----
27	7.4	1.5	.3	1.6	4.5	8.9	17	38	17	.7	-----
28	7.4		.3	1.6	5.5	9.9	17	39	15	.7	-----
29	7.0		.5	1.4	6.2	10.0	15	39	13	.9	-----
30	7.0	1.2	.2	1.4	-----	11.0	13	37	11	1.1	-----
31	7.0	-----	.3	1.4	-----	9.4	-----	34	-----	.9	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	8.1	2.2	5.83	358
November	-----	1.2	5.66	337
December	1.2	.2	.75	46
January	1.6	.2	.85	52
February	6.2	.9	1.82	105
March	11	1.8	4.48	275
April	20	1.6	10.7	637
May	122	13	52.7	3,240
June	108	11	42.3	2,520
July	11	.7	3.29	202
August 1-10	.9	.5	.58	12
The period	-----	-----	-----	7,780

## 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., about a quarter of a mile below mouth of Deadman Creek and 6 miles northwest of Marysville.

DRAINAGE AREA.—69 square miles.

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

EXTREMES.—Maximum discharge during year, 110 second-feet May 14 (gage height, 1.44 feet); minimum, 5.7 second-feet Dec. 4-16, 20-31, Mar. 13-20 (gage height, 0.36 foot).

1909-11, 1913-32: Maximum discharge, 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. No records Jan. 1 to Mar. 12. Some diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	7.9	6.3		9.8	26	46	30	14	12
2	6.3	7.9	6.3		9.8	24	52	30	14	12
3	6.3	7.9	6.3		11	25	52	30	14	12
4	6.3	7.9	5.7		11	27	53	29	14	12
5	6.3	7.9	5.7		11	31	59	29	13	10
6	6.3	7.9	5.7		11	36	59	29	13	10
7	6.3	7.9	5.7		11	44	59	27	12	10
8	6.3	7.9	5.7		9.8	58	59	25	12	10
9	6.3	7.0	5.7		9.8	73	64	23	12	10
10	6.3	7.0	5.7		9.8	85	63	23	12	10
11	6.3	7.0	5.7		9.8	92	62	23	12	8.0
12	7.0	7.0	5.7		11	99	59	23	12	8.0
13	7.0	7.0	5.7	5.7	12	106	57	23	12	8.0
14	7.0	7.0	5.7	5.7	14	110	54	23	12	8.0
15	7.0	7.0	5.7	5.7	16	96	50	23	12	8.0
16	7.0	7.0	5.7	5.7	17	86	50	22	12	8.0
17	7.0	7.0	6.3	5.7	20	79	51	22	12	8.0
18	7.9	7.0	6.3	5.7	23	75	50	20	10	6.6
19	7.9	7.0	6.3	5.7	24	74	43	20	10	6.6
20	7.9	7.0	6.3	5.7	25	74	43	20	10	7.3
21	7.9	7.0	6.3	7.0	25	77	43	20	10	7.3
22	7.9	7.0	6.3	7.0	26	79	41	20	9.2	8.0
23	7.9	7.0	5.7	7.0	26	77	41	18	9.2	8.0
24	7.9	7.0	5.7	7.0	26	74	45	17	9.2	8.0
25	7.9	7.0	5.7	6.3	26	66	45	17	9.2	8.0
26	7.9	7.0	5.7	6.3	26	60	43	17	10	8.0
27	7.9	7.0	5.7	7.0	27	59	39	14	10	8.0
28	7.9	7.0	5.7	7.9	27	57	37	14	10	7.3
29	7.9	6.3	5.7	7.9	27	54	35	13	10	7.3
30	7.9	6.3	5.7	7.9	26	52	30	14	10	7.3
31	7.9		5.7	8.9		50		14	12	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7.9	6.3	7.16	440
November	7.9	6.3	7.19	428
December	6.3	5.7	5.87	361
March 13-31	8.9	5.7	6.62	249
April	27	9.8	17.9	1,070
May	110	24	65.3	4,020
June	64	30	49.5	2,950
July	30	13	21.7	1,330
August	14	9.2	11.4	701
September	12	6.6	8.72	519

## DEARBORN RIVER BASIN

## DEARBORN RIVER NEAR CLEMONS, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 26, T. 18 N., R. 7 W., 300 feet above highway bridge 2 miles below mouth of Falls Creek and 5 miles southwest of Clemons.

DRAINAGE AREA.—122 square miles.

RECORDS AVAILABLE.—April 1921 to September 1923; July 1929 to September 1932. May 1908 to December 1911 at station half a mile above mouth of Falls Creek.

EXTREMES.—Maximum discharge during year, 1,150 second-feet June 10 (gage height, 3.41 feet); minimum, 11 second-feet Oct. 14 (gage height, 0.71 foot).

1921-23, 1929-32: Maximum discharge, 1,340 second-feet June 6, 1922 (gage height, 3.70 feet); minimum, 10 second-feet Oct. 17-21, 1922 (gage height, 0.84 foot).

REMARKS.—Records good. Discharge estimated because of ice Nov. 24-30. No record Dec. 1 to Mar. 21. Several small diversions above gage.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	26	-----	27	52	216	154	21	25
2	12	26	-----	29	54	222	149	20	25
3	12	26	-----	31	54	216	142	20	24
4	12	26	-----	32	56	219	132	19	24
5	12	26	-----	34	66	249	110	19	24
6	12	26	-----	36	90	252	103	19	24
7	12	26	-----	39	119	267	96	19	23
8	12	26	-----	41	167	308	83	19	23
9	12	26	-----	41	238	729	64	18	23
10	12	26	-----	36	308	1, 110	61	17	23
11	12	24	-----	39	373	938	59	17	22
12	12	22	-----	31	378	818	57	17	22
13	12	24	-----	50	481	743	50	17	22
14	11	25	-----	68	503	659	45	17	22
15	12	26	-----	70	408	606	44	18	22
16	12	24	-----	59	316	587	41	18	22
17	14	22	-----	66	271	481	39	18	22
18	18	21	-----	66	275	423	39	18	22
19	23	21	-----	64	283	378	39	18	22
20	26	21	-----	62	316	344	38	17	22
21	29	19	-----	61	388	330	38	18	22
22	30	19	26	57	378	316	34	18	22
23	29	17	26	56	308	308	31	18	23
24	29	17	27	52	249	283	27	21	22
25	29		26	56	213	249	26	24	22
26	29		26	56	192	235	26	24	22
27	29		26	54	181	219	29	25	22
28	28	17	26	56	167	201	61	25	22
29	28		26	56	167	170	27	25	21
30	27		26	56	192	165	22	25	20
31	27		26	-----	216	-----	21	25	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	30	11	18.9	1, 160
November	26	17	22.1	1, 320
March 22-31	27	26	26.1	518
April	70	27	49.4	2, 940
May	503	52	241	14, 800
June	1, 110	165	408	24, 300
July	154	21	60.9	3, 740
August	25	17	19.8	1, 220
September	25	20	22.5	1, 340

## SMITH RIVER BASIN

## SMITH RIVER AT TRULY, MONT.

LOCATION.—Wire gage in SW¼ sec. 35, T. 19 N., R. 2 E., at highway bridge at former post office of Truly.

RECORDS AVAILABLE.—March 1905 to June 1907 and March 1929 to September 1932 (discontinued).

EXTREMES.—Maximum discharge for year, 2,900 second-feet June 10 (gage height, 5.25 feet); minimum, 12 second-feet Nov. 24 (gage height, 0.57 foot). 1905-7, 1929-32: Maximum discharge, 4,010 second-feet June 24, 1907 (gage height, 9.00 feet, old datum); minimum, 0.2 second-foot Sept. 10, 1931 (gage height, 0.20 foot).

REMARKS.—Records good. Flow not computed because of ice Dec. 1 to Mar. 19. Discharge estimated for period of ice effect, Nov. 25-30. Several diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	77	54	-----	196	275	597	456	81	94
2.....	74	55	-----	848	275	54 <sup>8</sup>	434	77	96
3.....	70	58	-----	548	275	52 <sup>1</sup>	392	65	85
4.....	44	58	-----	456	332	524	392	58	81
5.....	58	57	-----	392	434	54 <sup>8</sup>	372	52	77
6.....	65	55	-----	312	524	64 <sup>3</sup>	352	52	70
7.....	65	55	-----	275	572	70 <sup>3</sup>	332	44	60
8.....	62	55	-----	241	597	75 <sup>3</sup>	294	44	57
9.....	57	55	-----	241	648	2,40 <sup>3</sup>	275	39	58
10.....	57	60	-----	210	788	2,90 <sup>3</sup>	258	50	54
11.....	57	60	-----	210	913	2,30 <sup>3</sup>	258	49	55
12.....	57	37	-----	226	1,130	1,92 <sup>3</sup>	241	52	58
13.....	55	46	-----	332	1,130	1,64 <sup>3</sup>	241	52	58
14.....	55	46	-----	434	1,290	1,38 <sup>3</sup>	226	43	58
15.....	55	58	-----	372	1,380	1,210	226	40	55
16.....	55	46	-----	372	1,210	1,46 <sup>3</sup>	210	42	55
17.....	52	58	-----	372	1,060	2,02 <sup>3</sup>	196	44	54
18.....	52	58	-----	456	913	1,74 <sup>3</sup>	154	28	54
19.....	52	52	-----	434	1,060	1,46 <sup>3</sup>	173	31	58
20.....	52	40	210	372	1,060	1,38 <sup>3</sup>	258	32	65
21.....	52	37	210	413	1,130	1,210	241	62	69
22.....	54	25	210	372	1,640	1,06 <sup>3</sup>	196	86	69
23.....	54	14	181	372	1,460	98 <sup>3</sup>	178	149	70
24.....	54	12	173	372	1,290	84 <sup>3</sup>	157	81	67
25.....	55	21	181	372	1,130	84 <sup>3</sup>	142	74	67
26.....	57	17	181	372	983	79 <sup>3</sup>	130	64	67
27.....	57	15	210	332	848	675	117	64	67
28.....	55	23	162	312	788	622	101	58	70
29.....	57	25	157	294	675	54 <sup>3</sup>	94	65	70
30.....	58	23	154	294	648	47 <sup>3</sup>	85	83	70
31.....	58	-----	157	-----	648	-----	81	94	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	77	44	57.5	3,540
November.....	60	12	42.5	2,530
March 20-31.....	210	154	182	4,330
April.....	848	196	360	21,400
May.....	1,640	275	874	53,700
June.....	2,900	478	1,160	69,000
July.....	456	81	234	14,400
August.....	149	28	59.8	3,680
September.....	96	54	66.3	3,950

## 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 1932.

EXTREMES.—Maximum discharge during year, 7,000 second-feet June 15 (gage height, 6.98 feet); minimum, 51 second-feet Feb. 4 (discharge measurement).

1902-7, 1911-32: Maximum discharge, 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 Nov. 11 to Apr. 24, which were estimated. Stage-discharge relation affected by ice Nov. 21 to Mar. 21. Numerous diversions from tributaries. Flow partly regulated by storage in several reservoirs on tributaries.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	268	208		194				900	1,790	1,210	269	206
2.....	264	206		189				920	2,140	1,210	260	196
3.....	271	203		168				900	2,800	1,240	247	190
4.....	271	200		147				900	2,620	1,190	236	172
5.....	264	208		122				1,540	2,540	1,210	232	169
6.....			180		52	1,400	750					
7.....	264	214		130				2,290	2,620	1,100	228	172
8.....	257	211		134				2,540	2,540	980	228	161
9.....	253	211		143				2,710	2,540	880	220	148
10.....	246	210		161				3,050	2,290	772	216	141
11.....	243	210		176				3,390	2,880	705	200	143
12.....												
13.....	236			189				3,640	3,480	646	196	150
14.....	243			192				3,640	3,300	597	203	153
15.....	240			166				3,820	3,140	558	220	148
16.....	236			116				4,070	3,050	854	220	138
17.....	230			108	85	475	725	3,980	3,530	597	213	136
18.....		190	165									
19.....	224			145				3,480	3,990	522	203	133
20.....	220			147				2,960	3,140	480	190	133
21.....	217			159				2,620	2,800	435	180	129
22.....	214			178				2,540	2,460	422	175	131
23.....	211							2,880	2,140	422	180	136
24.....												
25.....	208		214					3,220	1,860	409	854	136
26.....	217		203					3,900	1,720	374	612	136
27.....	220		211				1,000	4,070	1,720	357	454	136
28.....	220		208					3,640	1,720	346	522	136
29.....	220		230		1,200		662	3,050	1,720	336	397	138
30.....		135		120		1,000						
31.....	230		243				734	2,540	1,660	315	331	138
1.....	224		268				850	2,140	1,540	291	286	145
2.....	208		271				830	1,860	1,410	296	264	145
3.....	220		257				830	1,720	1,340	310	236	136
4.....	214		236				830	1,720	1,260	320	216	133
5.....	214		214					1,600		291	213	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	271	208	234	14,400
November.....	214		178	10,600
December.....	271		194	11,900
January.....	194	108	142	8,730
February.....			430	24,200
March.....			960	59,000
April.....		662	783	46,600
May.....	4,070	900	2,650	163,000
June.....	3,990	1,260	2,390	142,000
July.....	1,240	291	635	39,000
August.....	854	175	281	17,300
September.....	206	129	149	8,870
The year.....	4,070	-----	752	546,000

## 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. Prior to Oct. 6, 1931, wire gage at same location, with zero 1.31 foot lower, was used.

RECORDS AVAILABLE.—October 1921 to September 1932.

EXTREMES.—Maximum discharge during year, 5,300 second-feet Feb. 29 (gage height, 9.48 feet, caused by ice jam); minimum, 45 second-feet Feb. 7-9.

1921-32: Maximum discharge, 14,300 second-feet June 1, 1927 (gage height, 17.9 feet, present datum); minimum, that of Feb. 7-9, 1932.

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

REMARKS.—Records excellent except those for period of ice effect, Nov. 17 to Mar. 24, and those estimated for Mar. 12-16, July 1-20, which are fair. Numerous diversions. Flow partly regulated by storage on tributaries.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	272	205	170	214	65	4,350	560	813	1,500	1,200	291	209
2.....	265	202	168	198	61	3,400	724	767	1,520		268	193
3.....	259	200	166	185	58	2,450	804	724	1,750		229	179
4.....	246	196	166	174	54	1,400	956	707	2,440		215	171
5.....	252	192	175	156	51	474	987	804	2,440		202	164
6.....	246	190	183	142	49	457	868	937	2,350	900	202	157
7.....	244	192	192	129	45	434	759	1,680	2,350		196	146
8.....	249	198	192	126	45	407	690	2,080	2,350		187	137
9.....	246	200	194	136	45	382	626	2,260	2,440		177	135
10.....	238	198	198	146	51	367	567	2,540	2,350		172	134
11.....	244	196	200	161	58	285	519	2,940	2,540	650	209	126
12.....	244	212	190	175	65	309	500	3,250	3,250		179	118
13.....	235	246	179	187	70	333	474	3,360	3,040		164	118
14.....	235	252	170	192	77	357	493	3,460	2,830		161	116
15.....	244	212	161	179	86	381	673	3,560	2,830		174	116
16.....	241	170	154	161	77	405	813	3,780	3,560	460	182	115
17.....	232	170	148	136	86	428	976	3,360	4,110		171	115
18.....	224	179	152	121	96	560	946	2,830	3,780		161	108
19.....	219	143	160	133	119	813	987	2,630	3,250		150	107
20.....	217	161	165	161	143	946	1,070	2,540	2,730		143	102
21.....	212	154	174	179	179	976	1,060	3,140	2,440	410	187	99
22.....	207	140	202	179	224	998	1,130	3,140	2,080	398	850	99
23.....	202	128	214	170	278	1,270	1,090	3,670	1,860	387	1,040	99
24.....	196	128	232	148	428	1,240	1,040	3,890	1,810	364	610	102
25.....	210	140	249	123	878	1,600	998	3,460	1,800	342	518	100
26.....	212	133	272	102	1,220	1,250	998	2,940	1,750	316	552	100
27.....	210	121	275	93	1,340	1,130	987	2,540	1,720	305	429	104
28.....	212	134	265	84	1,280	946	946	2,170	1,570	282	342	104
29.....	212	146	262	78	5,300	831	850	1,850	1,450	264	291	102
30.....	207	161	265	74	699	699	785	1,680	1,270	288	286	107
31.....	202	-----	249	69	642	-----	-----	1,600	-----	347	240	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	272	196	230	14,100
November.....	252	121	177	10,500
December.....	275	148	198	12,200
January.....	214	69	146	8,980
February.....	5,300	45	432	24,800
March.....	4,350	285	985	60,600
April.....	1,130	474	829	49,300
May.....	3,890	707	2,420	149,000
June.....	4,110	1,270	2,370	141,000
July.....	-----	264	637	39,200
August.....	1,040	143	296	18,200
September.....	209	99	126	7,500
The year.....	5,300	45	738	535,000



BIRCH CREEK NEAR DUPUYER, MONT.

LOCATION.—Staff gage in sec. 28, T. 29 N., R. 8 W., half a mile above B canal head gates and 12 miles west of Dupuyer.

DRAINAGE AREA.—110 square miles.

RECORDS AVAILABLE.—July 1907 to September 1926; October 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 551 second-feet June 16 (gage height, 2.27 feet); minimum occurred during ice period.

1907–26, 1927–31: Maximum discharge (estimated), 5,000 second-feet June 21, 1916 (gage height, 10.0 feet); minimum, 3 second-feet Apr. 7, 1921.

REMARKS.—Records good. Discharge estimated Dec. 1 to Feb. 26. Two or three small diversions above station. Flow largely controlled by gate operations at Swift Dam. Records furnished by Valier-Montana Land & Water Co.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	144	16				10	12	136	315	204	339	28
2	153	16				10	10	136	265	177	334	28
3	156	16				10	10	136	261	194	334	26
4	156	16				9	10	144	257	194	311	26
5	162	16				10	16	168	257	181	306	25
6		134	15			10	12	168	265	168	306	23
7	68	15				10	12	168	265	156	306	21
8	62	16				10	12	168	265	204	302	20
9	59	13				10	15	177	280	207	298	19
10	59	15				11	12	221	280	207	298	18
11	57	14				11	40	242	350	250	298	17
12	55	14				11	69	284	423	284	293	17
13	55	14				12	66	315	474	334	289	16
14	52	13			10	12	181	355	515	355	289	14
15	50	12		6		12	106	365	507	375	289	14
16	50	12	7			11	104	381	551	375	280	14
17	26	11				10	104	375	529	370	280	14
18	23	11				10	104	370	474	381	280	23
19	20	10				12	106	329	448	381	272	28
20	19	10				12	106	329	448	423	272	30
21	19	10				11	121	329	355	429	280	31
22	19	10				11	126	375	253	423	265	35
23	18	9				11	126	375	232	480	221	35
24	17	9				11	139	381	228	480	153	36
25	17	9				11	136	381	242	474	104	37
26	17	9				10	136	381	265	474	62	40
27	17	8				9	134	387	242	474	55	38
28	17	8				13	11	134	365	228	405	38
29	17	8				12	12	134	344	224	399	50
30	16	8					11	134	339	214	399	32
31	16						12		315		393	29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	162	16	56.5	3,470
November	16	8	12.1	720
December			7.0	430
January			6.0	369
February	13		10.2	587
March	12	9	10.7	658
April	181	10	80.9	4,810
May	387	136	288	17,700
June	551	214	330	19,600
July	480	156	331	20,400
August	339	29	235	14,400
September	40	14	26.3	1,560
The year	551		117	84,700

## DUPUYER CREEK NEAR VALIER, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 33, T. 29 N., R. 6 W., 6 miles below mouth of Sheep Creek and 11 miles southwest of Valier.

DRAINAGE AREA.—111 square miles.

RECORDS AVAILABLE.—July 1912 to September 1926; October 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 203 second-feet June 11 (gage height, 3.87 feet); minimum, 1 second-foot Sept. 18 (gage height, 2.49 feet).

1912-26, 1927-32: Maximum discharge, 2,180 second-feet June 21, 1916 (gage height, 6.5 feet); no flow Sept. 19, 1919, Sept. 1-2, 1929, and various times in 1931.

REMARKS.—Records fair. Several diversions above station. Somewhat regulated by head gates upstream. Records furnished by Valier-Montana Land & Water Co.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	13	7	7		60	33	25	31	12	7	9
2	7	13	9	7		30	32	22	31	12	6	9
3	8	11	8	7		10	33	23	30	11	6	8
4	8	12	7	7		10	27	28	27	12	5	7
5	8	12	7	7		10	27	56	22	12	6	6
6	10	10	7	7		8	25	72	22	10	6	6
7	10	9	7	7		6	27	66	38	8	5	5
8	10	10	5	10		5	21	64	40	8	5	4
9	8	9	5	10		5	19	69	78	7	4	4
10	8	10	5	10		5	20	70	155	5	5	3
11	8	7	5	10	6	5	20	70	203	5	6	3
12	10	7	5	7		5	21	66	185	4	6	3
13	10	7	5	7		5	21	63	155	4	6	2
14	9	6	5	7		5	20	69	133	4	5	2
15	9	5	8	7		5	20	67	115	3	5	2
16	9	5	10	7		5	18	63	111	3	5	2
17	9	5	12	7		5	18	55	111	3	5	1
18	9	5	23	7		25	17	48	86	3	5	1
19	9	5	20	8		40	15	48	72	4	7	1
20	10	5	20	10		50	15	48	61	4	9	2
21	10	5	20	10		40	17	56	50	4	58	3
22	10	5	20	10	8	30	23	59	43	5	44	3
23	11	5	20	12	8	20	31	52	39	4	65	2
24	11	5	20	12	12	20	38	48	34	4	22	3
25	12	5	20	12	22	15	39	44	29	5	17	4
26	12	5	15	12	50	15	35	44	25	5	15	4
27	12	5	15	9	100	15	32	46	25	5	12	4
28	12	5	12	7	125	46	29	41	23	8	12	4
29	12	5	12	7	125	30	28	40	20	5	10	4
30	13	5	8	6		20	26	41	19	6	10	4
31	13		8	6		35		35		6	10	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13	6	9.77	601
November	13	5	7.20	428
December	23	5	11.3	695
January	12	6	8.35	513
February	125		19.9	1,140
March	60	5	18.9	1,160
April	39	15	24.9	1,480
May	72	22	51.5	3,170
June	203	19	67.1	3,990
July	12	3	6.16	379
August	65	4	12.5	769
September	9	1	3.83	228
The year	203	1	20.1	14,600

TETON RIVER NEAR FORT BENTON, MONT.

LOCATION.—Wire gage in SE¼ sec. 31, T. 25 N., R. 9 E., at Embleton's ranch 6 miles north of Fort Benton.

RECORDS AVAILABLE.—March 1929 to September 1932 (discontinued).

EXTREMES.—Maximum stage during year, 8.85 feet Aug. 22 (estimated discharge, 5,660 second-feet); no flow at various times.

1929-32: Maximum discharge for period, that of Aug. 22, 1932; no flow at various times.

REMARKS.—Records good except those for periods of ice effect, Dec. 29-31, Mar. 3-21, and for flood period Aug. 22-23, which are fair, and those for Aug. 23-30, which are poor. Flow regulated by numerous diversions for storage and direct irrigation.

*Discharge, in second-feet, 1931-32*

Day	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0	0	260	76	39	36	49	0 4	26
2.....	0	0	131	105	36	30	44	.2	24
3.....	0	0	128	90	34	31	39	0	21
4.....	0	0	74	74	34	31	42	0	20
5.....	0	0	30	66	35	38	42	0	19
6.....	0	0	29	59	34	41	38	0	17
7.....	0	0	30	50	31	45	25	0	14
8.....	0	0	26	44	29	61	22	0	14
9.....	0	0	24	42	27	82	18	0	13
10.....	0	0	24	38	25	93	15	0	12
11.....	0	0	25	39	23	115	13	.9	11
12.....	0	0	23	39	19	180	12	.3	9.2
13.....	0	0	24	35	17	230	12	0	7.6
14.....	0	0	26	32	16	226	31	0	5.4
15.....	0	0	29	30	15	180	24	492	4.4
16.....	0	0	59	26	14	157	19	282	4.0
17.....	0	0	74	24	14	146	12	99	3.8
18.....	0	0	108	24	14	247	8.5	36	3.5
19.....	0	0	149	23	17	454	7.6	18	3.5
20.....	0	0	234	20	21	282	7.2	12	3.2
21.....	0	0	161	21	24	196	5.4	50	2.8
22.....	0	0	205	30	26	149	4.4	2,220	2.8
23.....	0	0	221	34	26	122	3.5	1,040	2.8
24.....	0	0	238	31	34	108	2.8	108	3.2
25.....	0	0	217	35	29	96	2.2	82	3.8
26.....	0	0	213	41	42	96	2.0	70	4.4
27.....	0	0	176	44	45	79	1.4	53	4.9
28.....	0	0	146	44	45	72	1.3	44	6.2
29.....	30	304	165	42	39	63	.9	41	6.2
30.....			112	39	42	55	.5	34	7.6
31.....			88	-----	39	-----	.4	30	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
December.....	-----	0	2.9	178
March.....	260	23	111	6,820
April.....	105	20	43.2	2,570
May.....	45	14	28.5	1,750
June.....	454	30	125	7,440
July.....	49	.4	16.3	1,000
August.....	2,220	0	152	9,350
September.....	26	2.8	9.34	556

NOTE.—No flow during October and November.

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 567 second-feet May 22 (gage height, 4.30 feet); minimum, 0.6 second-foot Apr. 18 (gage height, 1.28 feet).

1919-32: Maximum discharge, 1,070 second-feet June 11, 1927 (gage height, 5.70 feet); minimum, 0.5 second-foot Nov. 16 to Dec. 1, 1919, Mar. 31 to Apr. 20, 1922 (gage height, 1.00 foot).

REMARKS.—Records good. Several diversions above station. No records Jan. 1 to Feb. 29.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	Jun?	July	Aug.	Sept.
1.....	2.9	2.4	2.4	1.3	1.3	.8	137	92	14	9.3
2.....	2.9	2.4	2.4	1.3	1.3	1.3	137	92	14	9.3
3.....	2.9	2.4	2.4	1.3	1.3	1.3	129	85	14	9.3
4.....	2.9	2.4	2.4	1.3	1.3	1.3	121	78	14	9.3
5.....	2.9	2.4	2.4	1.3	1.3	1.3	129	73	12	9.3
6.....	2.9	2.4	2.4	1.3	1.3	1.3	129	68	12	8.5
7.....	2.9	2.4	2.4	1.3	1.3	1.3	129	60	11	8.5
8.....	2.9	2.4	2.4	1.3	1.3	1.3	222	53	11	8.5
9.....	2.9	2.4	2.4	1.3	1.3	1.3	315	51	11	8.5
10.....	2.9	2.4	2.4	1.3	1.3	.8	375	49	11	7.6
11.....	2.9	2.4	2.4	1.3	1.3	65	315	46	11	7.6
12.....	2.9	2.4	2.4	1.3	.8	137	315	44	11	7.6
13.....	2.9	2.4	2.4	1.3	.8	172	300	44	11	7.6
14.....	2.9	2.4	2.4	1.3	.8	222	283	42	11	8.5
15.....	2.9	2.4	2.4	1.3	.8	234	259	42	11	8.5
16.....	2.9	2.4	2.4	1.3	.8	191	243	40	11	8.5
17.....	2.9	2.4	2.4	.8	.8	165	222	36	11	8.5
18.....	2.9	2.4	2.4	.8	.7	154	201	36	10	7.6
19.....	2.9	2.4	2.4	.8	.8	182	191	34	10	7.6
20.....	2.9	2.4	2.4	1.3	.8	201	191	46	10	7.6
21.....	2.9	2.4	2.4	1.3	.8	234	163	32	11	7.6
22.....	2.9	2.4	2.4	1.3	.8	534	154	27	11	7.6
23.....	2.9	2.4	2.4	1.3	.8	534	137	25	10	7.6
24.....	2.9	2.4	2.4	1.3	1.3	406	121	23	10	7.6
25.....	2.5	2.4	2.4	1.3	1.3	345	114	19	10	7.6
26.....	2.9	2.4	2.4	1.3	1.3	272	114	19	10	7.6
27.....	2.9	2.4	2.4	1.3	1.3	222	114	19	10	7.6
28.....	2.4	2.4	1.8	1.3	1.3	191	106	16	10	7.6
29.....	2.4	2.4	1.8	1.3	1.3	172	99	15	11	7.6
30.....	2.4	2.4	1.8	1.3	.8	154	92	14	10	7.6
31.....	2.4	-----	1.8	1.3	-----	146	-----	14	10	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2.9	2.4	2.84	175
November.....	2.4	2.4	2.40	143
December.....	2.4	1.8	2.32	143
March.....	1.3	.8	1.25	77
April.....	1.3	.7	1.08	64
May.....	534	.8	160	9,840
June.....	375	92	186	11,100
July.....	92	14	43.0	2,640
August.....	14	10	11.1	682
September.....	9.3	7.6	8.12	483

## JUDITH RIVER NEAR WINIFRED, MONT.

LOCATION.—Wire gage near center of sec. 30, T. 21 N., R. 17 E., at Anderson ranch near Winifred.

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

EXTREMES.—Maximum discharge, 4,510 second-feet June 10 (gage height, 5.14 feet); minimum, 171 second-feet Aug. 27 (gage height, 0.48 foot).

1929-32: Maximum discharge for period, 4,510 second-feet Feb. 18, 1930, June 10, 1932 (gage heights, 5.10 feet and 5.14 feet, respectively); minimum, 167 second-feet July 25-29, 1931 (gage height, 0.52 foot).

REMARKS.—Records good except those for periods of ice effect, Nov. 17 to Dec. 31 and Mar. 14-18, which are fair. No records Jan. 1 to Feb. 27. Numerous diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	278	258	-----	379	986	345	486	453	208	227
2	268	258	-----	345	626	345	422	422	208	218
3	268	247	-----	333	663	333	391	453	196	227
4	268	247	-----	300	589	311	379	554	196	237
5	268	247	-----	-----	486	311	368	486	196	227
6	268	258	-----	-----	422	300	422	453	196	227
7	268	258	-----	-----	368	300	519	422	196	227
8	268	247	-----	200	362	300	702	333	196	247
9	268	247	-----	-----	362	300	2,750	350	218	237
10	268	258	-----	-----	333	300	4,400	330	218	258
11	268	258	-----	-----	300	311	3,300	330	227	258
12	278	268	-----	-----	300	311	2,220	311	196	258
13	278	268	-----	250	311	333	1,530	289	180	268
14	278	258	-----	-----	322	333	1,340	268	180	268
15	278	268	-----	-----	322	453	1,720	249	189	258
16	268	278	-----	-----	311	519	1,720	227	208	258
17	268	278	-----	300	300	486	1,530	227	258	258
18	268	263	-----	-----	278	391	1,250	227	278	247
19	268	237	-----	554	278	453	1,070	422	247	227
20	268	237	-----	986	300	519	986	589	199	237
21	278	237	-----	589	300	554	902	368	208	237
22	278	227	-----	486	322	663	820	258	227	237
23	278	180	-----	422	322	740	780	258	1,120	237
24	278	180	-----	422	368	820	740	227	311	237
25	268	180	-----	453	453	663	942	199	237	247
26	268	180	-----	453	391	663	780	199	208	237
27	268	199	-----	391	379	554	663	189	17	237
28	268	218	-----	663	356	554	589	189	218	258
29	268	227	391	861	356	589	554	180	247	258
30	268	227	391	453	368	663	391	180	345	247
31	268	-----	-----	519	-----	663	-----	227	278	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	278	268	271	16,700
November	278	180	240	14,300
December	-----	-----	190	11,700
January	986	-----	389	23,900
February	986	278	394	23,400
March	820	300	464	28,500
April	4,400	368	1,160	69,000
May	589	180	318	19,600
June	1,120	171	251	15,400
July	268	218	243	14,500

## MUSSELSHELL RIVER BASIN

## NORTH FORK OF MUSSELSHELL RIVER AT DELPINE MONT.

LOCATION.—Wire gage in SW¼ sec. 35, T. 10 N., R. 9 E., at Delpine.

DRAINAGE AREA.—48 square miles.

RECORDS AVAILABLE.—May 1909 to October 1911; March 1922 to September 1932.

EXTREMES.—Maximum discharge during year, 15 second-feet Mar. 31 to Apr. 2 (gage height, 1.64 feet); minimum, 3.0 second-feet Oct. 1, 4, 6-7 (gage height, 1.36 feet).

1909-11, 1922-32: Maximum discharge, 545 second-feet July 21, 1923 (gage height, 4.5 feet); minimum, 0.1 second-foot Mar. 28, 1931 (gage height, 1.17 feet).

REMARKS.—Records fair. One small ditch diverts above gage. No records Jan. 1 to Mar. 27.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	6.2	5.9		15	11	9.0	9.7	8.3	8.6
2	3.5	6.2	5.9		15	11	9.0	9.7	8.3	8.6
3	3.5	5.6	5.9		7.6	11	8.6	9.3	7.6	8.6
4	3.0	6.2	5.9		7.6	9.7	8.6	8.6	7.9	9.3
5	3.5	6.2	5.9		6.9	9.7	10	9.0	8.6	9.3
6	3.0	6.2	5.9		7.6	9.3	9.3	8.3	7.9	9.3
7	3.0	6.2	5.9		6.6	9.3	9.3	7.9	8.3	9.3
8	3.5	6.2	5.9		7.3	10	8.6	7.9	8.3	9.3
9	5.1	6.2	5.9		7.9	10	8.6	8.3	8.3	9.3
10	6.2	6.2	5.9		8.6	10	8.6	7.6	8.6	9.3
11	6.2	6.2	5.9		8.6	10	8.3	7.9	8.6	9.3
12	5.6	6.2	5.9		8.6	10	7.6	7.9	8.6	9.3
13	5.6	6.2	5.9		8.6	9.7	8.3	7.6	8.6	9.3
14	6.2	6.2	5.9		8.6	9.7	7.6	7.6	9.0	9.3
15	6.2	5.6	5.9		8.6	9.7	7.6	7.3	9.0	9.3
16	6.2	5.6	5.9		8.3	9.7	7.6	7.3	9.0	9.3
17	6.2	5.6	5.9		8.3	11	7.6	7.3	9.0	9.3
18	6.2	5.6	5.9		8.3	12	7.6	7.3	9.3	9.3
19	6.2	5.6	5.9		8.3	11	7.6	6.9	9.3	9.3
20	5.6	5.6	5.9		8.3	12	6.9	6.9	9.3	9.3
21	6.2	5.6	5.9		9.0	11	5.9	7.9	9.0	9.3
22	6.2	5.6	5.9		9.0	11	5.9	7.3	9.0	9.3
23	6.2	5.6	5.9		7.9	10	5.6	7.6	9.0	9.3
24	6.2	5.6	5.9		8.6	10	5.6	6.9	9.0	9.3
25	6.2	5.6	5.9		9.3	10	5.6	6.6	9.0	9.3
26	6.2	5.6	5.9		11	10	5.4	6.6	9.3	9.3
27	6.2	5.6	5.9		11	10	4.8	6.9	9.3	9.3
28	6.2	5.6	5.9	11	11	9.7	4.6	6.9	9.3	9.3
29	6.2	5.6	5.9	12	11	9.0	4.6	7.9	9.0	9.3
30	5.6	5.6	5.9	14	9.7	9.0	4.8	7.9	9.0	9.3
31	5.6		5.9	15		9.0		7.9	9.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6.2	3.0	5.31	326
November	6.2	5.6	5.86	349
December	5.9	5.9	5.90	363
March	15	11	13.0	103
April	15	6.6	9.07	540
May	12	9.0	10.1	621
June	10	4.6	7.30	434
July	9.7	6.6	7.76	477
August	9.3	7.6	8.76	539
September	9.3	8.6	9.23	549

# MUSSELSHELL RIVER BASIN

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**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 September 1932.  
**EXTREMES.**—Maximum discharge during year, 561 second-feet June 13 (gage height, 4.14 feet); no flow for long periods.  
 1907-32: Maximum discharge recorded, 4,020 second-feet May 27, 1917 (gage height, 7.3 feet, present datum); no flow at times during several years.  
**REMARKS.**—Records good. No records Mar. 1-11. Numerous diversions.

*Discharge, in second-feet, 1931-32*

Day	Feb.	Mar.	Apr.	May	June	July	Day	Feb.	Mar.	Apr.	May	June	July
1.---	0	---	53	34	74	22	16.---	0	504	63	238	411	3.0
2.---	0	---	84	32	61	18	17.---	0	486	48	197	379	2.2
3.---	0	---	193	37	53	17	18.---	0	468	39	155	306	2.0
4.---	0	---	149	47	45	16	19.---	0	450	40	137	252	2.2
5.---	0	---	117	52	41	11	20.---	0	405	36	140	247	2.0
6.---	0	---	88	57	53	7.6	21.---	0	296	33	179	179	2.0
7.---	0	---	74	84	64	4.6	22.---	0	225	45	344	158	1.5
8.---	0	---	64	74	450	3.2	23.---	0	186	48	450	123	1.0
9.---	0	---	58	56	522	3.0	24.---	0	146	48	275	88	.8
10.---	0	---	52	69	486	2.5	25.---	0	106	45	213	81	.6
11.---	0	---	44	81	486	2.0	26.---	0	66	42	155	61	.4
12.---	0	486	44	104	486	2.5	27.---	0	64	44	128	58	0
13.---	0	486	46	143	522	2.5	28.---	317	60	46	112	49	0
14.---	0	486	57	189	486	5.2	29.---	285	58	44	104	36	0
15.---	0	522	61	247	450	4.6	30.---	---	45	40	92	29	.3
							31.---	52	---	---	84	---	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February	317	0	20.8	1,200
March 12-31	522	45	28.0	11,100
April	193	33	6.5	3,660
May	450	32	136	8,550
June	522	29	225	13,400
July	22	0	4.51	277

NOTE.—No flow during months omitted. No records Mar. 1-11.

## MUSSELSHELL RIVER AT MUSSELSHELL, MONT.

LOCATION.—Wire gage in NW¼ sec. 28, T. 29 N., R. 29 E., at highway bridge at Musselshell.

RECORDS AVAILABLE.—August 1928 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 2,130 second-feet June 9 (gage height, 6.18 feet); no flow Oct. 1 to Feb. 23.

1928-32: Maximum discharge, that of June 9, 1932; no flow at various times.

REMARKS.—Records good except those for extreme high water, which are fair, and those of discharge below 50 second-feet, which are poor. Numerous diversions above station.

*Discharge, in second-feet, 1931-32*

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.2	43	12	62	119	7.8	11.0
2	0	.2	40	12	51	99	6.8	9.2
3	0	.2	36	12	46	82	5.7	7.1
4	0	.2	35	12	42	68	5.0	7.6
5	0	.2	30	14	36	75	7.8	7.6
6	0	.2	30	14	37	62	8.6	7.1
7	0	.2	25	14	33	48	7.1	6.6
8	0	.2	23	14	140	44	6.6	5.2
9	0	.2	23	14	1,250	42	6.4	4.8
10	0	.2	18	14	1,560	44	5.0	5.0
11	0	.2	18	13	1,410	37	4.5	4.1
12	0	.2	17	13	1,410	30	109	4.5
13	0	.2	16	12	1,350	26	75	4.5
14	0	.2	14	12	1,120	21	29	4.1
15	0	.2	13	11	955	20	18	3.7
16	0	.2	13	9.7	740	18	14	3.4
17	0	.2	12	8.9	572	13	13	3.2
18	0	.2	10	7.8	518	11	13	3.1
19	0	.2	10	17	468	10	14	2.8
20	0	.8	10	29	390	11	34	2.5
21	0	1.0	8.9	36	372	21	28	2.1
22	0	1.0	8.9	37	355	57	18	1.8
23	0	5.0	10	36	323	41	17	1.7
24	.2	15	9.5	62	308	26	15	1.6
25	.2	27	10	90	339	19	12	1.6
26	.2	53	11	140	278	14	11	1.8
27	.2	62	11	151	263	12	10	1.8
28	.2	62	12	197	222	11	8.6	1.8
29	.2	57	13	151	197	11	7.8	1.8
30	---	57	14	90	162	8.9	8.9	1.6
31	---	50	---	75	---	7.3	11	---

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February	0.2	0	0.04	2.3
March	62	.2	12.7	781
April	43	8.9	18.1	1,080
May	197	7.8	42.9	2,640
June	1,590	33	501	29,800
July	119	7.3	35.7	2,200
August	109	4.5	17.3	1,060
September	11	1.6	4.16	248
The year	1,590	0	52.1	37,800

NOTE.—No flow during months omitted.



## MUSSELSHELL RIVER AT MOSBY, MONT.

LOCATION.—Wire gage in NW¼ sec. 11, T. 14 N., R. 30 E., at highway bridge half a mile west of Mosby.

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

EXTREMES.—Maximum discharge, 3,440 second-feet June 9 (gage height, 7.94 feet); no flow at various times.

1929-32: Maximum discharge, that of June 9, 1932 no flow at various times.

REMARKS.—Records fair. Numerous diversions.

*Discharge, in second-feet, 1931-32*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1-----	0	56	0	340	95	160	16-----	0	0	1,020	264	179	86
2-----	0	49	0	264	74	173	17-----	0	0	1,020	200	148	80
3-----	0	45	0	458	66	138	18-----	0	0	1,230	167	128	74
4-----	0	39	0	600	56	110	19-----	0	0	1,020	148	174	71
5-----	0	35	13	380	52	92	20-----	0	0	917	340	77	69
6-----	0	321	30	340	49	89	21-----	0	0	820	283	58	66
7-----	0	173	173	302	71	89	22-----	0	0	729	478	128	61
8-----	0	110	399	235	69	69	23-----	0	0	642	302	379	54
9-----	0	56	3,440	193	69	418	24-----	118	0	868	214	370	41
10-----	0	37	2,920	154	66	642	25-----	283	0	1,070	138	340	39
11-----	0	26	2,600	179	1,280	200	26-----	56	0	729	106	283	37
12-----	0	19	1,440	142	399	173	27-----	45	0	642	102	235	35
13-----	0	10	1,330	128	321	148	28-----	62	0	642	95	172	35
14-----	0	2.7	1,170	774	246	114	29-----	118	0	498	92	89	35
15-----	0	1.0	966	340	207	95	30-----	49	0	360	92	138	35
							31-----		0		98	148	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April-----	283	0	24.4	1,450
May-----	321	0	31.6	1,940
June-----	3,440	0	890	53,000
July-----	774	92	256	15,700
August-----	1,280	49	195	12,000
September-----	642	35	118	7,020
The year-----				91,100

NOTE.—No flow during months omitted.

## CHECKERBOARD CREEK AT DELPINE, MONT.

LOCATION.—Staff gage in NE¼ sec. 2, T. 9 N., R. 9 E., just below highway bridge a quarter of a mile southeast of Delpine and half a mile above junction with north fork of Musselshell.

DRAINAGE AREA.—24.3 square miles.

RECORDS AVAILABLE.—March 1922 to September 1932. May 1909 to December 1911 and May 1913 to December 1924 at site 2 miles above present station.

EXTREMES.—Maximum discharge during year, 12 second-feet May 9-21; minimum, 1.0 second-foot several days (gage height, 0.89 foot).

1909-11, 1913-14, 1922-32: Maximum discharge, 167 second-feet July 16, 1923 (gage height, 3.1 feet); minimum, 0.6 second-foot July 13-15, 1931 (gage height, 0.96 foot).

REMARKS.—Records fair. No records Jan. 1, to Mar. 27. One small diversion above gage.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	2.1	1.6	-----	2.9	4.0	5.3	2.6	1.4	1.4
2	2.1	2.1	1.6	-----	2.9	4.0	5.2	2.4	1.4	1.4
3	2.1	2.1	1.6	-----	3.2	4.0	5.0	2.4	1.4	1.4
4	2.1	2.1	1.6	-----	3.2	4.0	5.0	2.2	1.4	1.4
5	2.4	2.1	1.6	-----	2.9	4.0	5.2	2.0	1.4	1.4
6	2.1	2.1	1.3	-----	3.2	4.0	4.7	2.0	1.2	1.4
7	2.1	2.1	1.3	-----	2.9	4.0	4.6	2.0	1.2	1.4
8	2.4	2.1	1.3	-----	3.2	11.0	4.6	1.8	1.2	1.4
9	2.4	2.1	1.3	-----	3.4	12.0	4.4	1.6	1.0	1.4
10	2.1	2.1	1.3	-----	3.4	12.0	4.0	1.4	1.2	1.4
11	2.4	2.1	1.3	-----	3.7	12.0	4.2	1.6	1.0	1.4
12	2.1	2.1	1.3	-----	3.7	12.0	4.2	1.4	1.2	1.4
13	2.1	2.1	1.3	-----	3.7	12.0	4.2	1.4	1.2	1.4
14	2.4	2.1	1.3	-----	4.0	12.0	4.2	1.2	1.2	1.4
15	2.4	1.8	1.3	-----	4.2	12.0	4.2	1.2	1.2	1.4
16	2.4	1.8	1.3	-----	4.2	12.0	4.2	1.0	1.2	1.4
17	2.1	1.6	1.3	-----	4.2	12.0	4.2	1.2	1.0	1.4
18	2.4	1.3	1.3	-----	4.2	12.0	4.2	1.0	1.0	1.6
19	2.4	1.3	1.3	-----	4.8	12.0	4.2	1.0	1.2	1.6
20	2.1	1.3	1.6	-----	4.8	12.0	4.2	1.0	1.4	1.4
21	2.1	1.0	1.3	-----	3.7	12.0	4.2	1.0	1.4	1.6
22	2.1	1.0	1.3	-----	4.0	11.0	4.2	1.0	1.4	1.6
23	2.1	1.3	1.3	-----	4.0	9.7	4.2	1.0	1.4	1.6
24	2.1	1.3	1.3	-----	4.0	8.8	4.2	1.0	1.4	1.6
25	2.1	1.3	1.3	-----	4.0	8.5	4.2	1.0	1.4	1.6
26	2.1	1.3	1.3	-----	4.0	7.8	4.2	1.0	1.4	1.6
27	2.1	1.3	1.3	-----	4.0	6.8	4.2	1.0	1.4	1.6
28	2.1	1.3	1.3	2.1	4.0	6.2	4.2	1.0	1.4	1.6
29	2.1	1.3	1.3	2.1	4.2	5.8	4.2	1.6	1.4	1.6
30	2.1	1.3	1.3	2.5	4.0	5.6	4.2	1.6	1.4	1.6
31	2.1	-----	1.3	2.9	-----	5.4	-----	1.6	1.4	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2.4	2.1	2.19	135
November	2.1	1.0	1.70	101
December	1.6	1.3	1.36	84
March 28-31	2.9	2.1	2.40	19
April	4.8	2.9	3.75	223
May	12	4.0	8.73	537
June	5.3	4.0	4.40	262
July	2.6	1.0	1.46	90
August	1.4	1.0	1.28	79
September	1.6	1.4	1.48	88

## SOUTH FORK OF MUSSELSHELL RIVER NEAR MARTINSDALE, MONT.

LOCATION.—Staff gage in NW¼ sec. 12, T. 8 N., R. 11 E., 1½ miles northeast of Martinsdale.

RECORDS AVAILABLE.—June 1907 to November 1914; June 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 375 second-feet May 22 (gage height, 3.00 feet); minimum, 0.2 second-foot Oct. 1 (gage height, 0.22 foot).

1907-14, 1930-32: Maximum discharge, 1,260 second-feet June 2-4, 1911 (gage height, 5.8 feet); no flow Aug. 7, 9, 11, 13-15, Sept. 13, 1908, Aug. 30 to Sept. 28, 1931.

REMARKS.—Records good. No records Nov. 19 to Mar. 24, Aug. 19 to Sept. 30. Discharge interpolated Aug. 8-17. Numerous diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.
1.....	0.2	1.5	-----	24	18	48	19	2.5
2.....	.3	1.6	-----	64	23	38	18	2.0
3.....	.4	1.6	-----	85	33	31	15	1.2
4.....	.5	1.5	-----	53	34	25	14	1.4
5.....	.6	1.5	-----	53	43	24	13	1.3
6.....	.7	1.5	-----	44	52	34	12	1.3
7.....	.7	1.5	-----	28	66	51	10	1.3
8.....	1.0	1.5	-----	22	70	128	8 6	1.3
9.....	1.2	1.5	-----	21	64	286	7 6	1.2
10.....	1.0	1.6	-----	19	80	286	8 6	1.1
11.....	1.0	1.6	-----	20	120	308	8 6	1.1
12.....	1.1	1.7	-----	34	172	352	8 0	1.0
13.....	1.1	1.7	-----	51	232	352	7 6	.9
14.....	1.1	1.7	-----	69	286	308	8 0	.8
15.....	1.2	1.6	-----	61	286	275	8 3	.7
16.....	1.0	1.6	-----	45	243	264	7 3	.7
17.....	1.0	1.6	-----	38	182	243	6 0	.6
18.....	1.0	1.6	-----	42	145	202	5 7	.5
19.....	1.0	-----	-----	34	154	172	7 6	-----
20.....	.9	-----	-----	28	202	154	7 6	-----
21.....	.9	-----	-----	30	243	112	6 3	-----
22.....	.7	-----	-----	36	375	105	5 7	-----
23.....	.8	-----	-----	33	286	94	4 8	-----
24.....	1.0	-----	-----	30	222	72	4 8	-----
25.....	1.2	-----	31	26	163	58	4 8	-----
26.....	1.4	-----	17	31	128	53	4 0	-----
27.....	1.3	-----	17	35	105	44	3 1	-----
28.....	1.2	-----	16	34	94	34	2 8	-----
29.....	1.3	-----	15	31	88	24	2 8	-----
30.....	1.4	-----	13	23	78	20	2 8	-----
31.....	1.4	-----	20	-----	70	-----	2 9	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1.4	0.2	0.95	58
November 1-18.....	1.7	1.5	1.58	56
March 25-31.....	31	13	18.4	255
April.....	85	19	38.1	2,270
May.....	375	18	141	8,670
June.....	352	20	140	8,330
July.....	19	2.8	7.91	486
August 1-18.....	2.5	.5	1.16	41

## AMERICAN FORK NEAR HARLOWTON, MONT.

LOCATION.—Chain gage in SW $\frac{1}{4}$  sec. 12, T. 7 N., R. 15 E., half a mile above Lebo Creek and about 5 miles southeast of Harlowton.

RECORDS AVAILABLE.—July 1907 to December 1911; May to December 1913; May 1924 to September 1932 (discontinued).

EXTREMES.—Maximum discharge for year, 124 second-feet June 10 (gage height, 2.72 feet); no flow at various times.

1907-11, 1913, 1924-32: Maximum discharge, 870 second-feet June 1, 1908 (gage height, 4.40 feet); no flow at various times.

REMARKS.—Records poor. No diversions. No records January to February.

## Discharge, in second-feet, 1931-32

Day	May	June	July	Day	May	June	July	Day	May	June	July
1-----	0	0.1	0.2	11-----	0	118	0	21-----	0	12	0
2-----	0	.1	.1	12-----	0	103	0	22-----	0	8.0	0
3-----	0	.1	.1	13-----	0	114	0	23-----	11.0	6.3	0
4-----	0	.1	.2	14-----	0	74	0	24-----	8.7	5.2	0
5-----	0	.1	.2	15-----	0	69	0	25-----	1.5	5.2	0
6-----	0	.1	.1	16-----	0	67	0	26-----	0	3.4	0
7-----	0	.5	.1	17-----	0	56	0	27-----	0	2.9	0
8-----	0	14	.1	18-----	0	54	0	28-----	0	1.3	0
9-----	0	118	.1	19-----	0	24	0	29-----	0	.8	0
10-----	0	124	.1	20-----	0	16	0	30-----	0	.4	0
								31-----	.4		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May-----	11	0	0.70	43
June-----	124	.1	33.3	1,980
July-----	.2	0	.04	2.6
The period-----				2,030

NOTE.—No flow during October to December, March, April, August, and September.

## LEBO CREEK NEAR HARLOWTON, MONT.

LOCATION.—Staff gage in SW¼ sec. 12, T. 7 N., R. 15 E., half a mile above junction with American Fork and 5 miles southeast of Harlowton.

DRAINAGE AREA.—48 square miles.

RECORDS AVAILABLE.—July 1907 to December 1911; May to November 1913; May 1924 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 118 second-feet June 8 (gage height, 3.68 feet); minimum, 0.4 second-foot May 25, June 2-5 (gage height, 1.50 feet).

1907-11, 1913, 1924-32: Maximum discharge, 417 second-feet July 6, 1928 (gage height, 6.90 feet); no flow at various times during 1908, 1929, 1930.

REMARKS.—Records fair except those for September, which are poor. No records Dec. 1 to Mar. 27. Numerous diversions and some storage above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1.4	1.7	-----	6.8	2.2	6.1	5.3	7.4	1.3
2.....	1.4	1.7	-----	5.0	2.2	.4	5.3	3.3	2.0
3.....	1.4	1.7	-----	5.0	3.1	.4	5.3	2.2	2.0
4.....	1.4	1.7	-----	5.0	3.1	.4	5.0	1.4	2.0
5.....	1.4	1.7	-----	4.8	2.2	.4	3.8	3.1	1.3
6.....	1.3	2.6	-----	5.0	2.2	9.4	3.8	8.7	2.0
7.....	1.3	2.6	-----	5.0	2.2	6.4	3.8	8.7	2.0
8.....	1.3	2.6	-----	5.0	1.3	111	3.8	8.7	2.5
9.....	1.3	2.6	-----	5.0	1.3	44	3.8	5.6	
10.....	1.3	2.6	-----	2.8	1.3	13	2.8	5.6	
11.....	1.1	3.7	-----	2.8	1.3	9.7	2.8	5.6	
12.....	1.1	4.8	-----	2.8	.7	9.7	2.8	4.0	
13.....	1.1	4.8	-----	2.6	2.0	16	2.8	4.0	1.5
14.....	1.1	4.8	-----	2.6	2.0	13	2.8	4.0	
15.....	1.1	4.8	-----	2.6	2.0	9.7	2.8	4.0	
16.....	1.0	4.8	-----	2.6	2.0	9.7	1.7	5.3	
17.....	1.0	4.8	-----	2.6	1.9	9.7	1.0	2.9	
18.....	1.0	2.6	-----	2.6	1.9	8.0	1.0	2.0	2.0
19.....	1.0	2.6	-----	2.6	1.9	8.4	2.6	2.0	
20.....	1.0	2.6	-----	2.6	1.9	6.8	2.6	1.3	
21.....	1.0	2.6	-----	2.6	1.9	5.3	2.6	2.9	
22.....	1.0	2.6	-----	4.6	1.9	5.3	2.6	2.9	
23.....	1.0	2.6	-----	3.3	1.9	5.3	1.0	2.9	2.0
24.....	1.0	2.6	-----	4.6	1.1	4.0	4.8	2.0	
25.....	1.0	2.6	-----	3.3	.4	4.0	3.6	2.0	
26.....	1.0	2.6	-----	2.4	3.6	4.0	4.6	2.0	
27.....	1.7	2.6	-----	4.6	6.8	4.0	4.6	1.3	
28.....	1.7	2.6	6.8	4.6	3.6	4.0	5.8	1.3	2.0
29.....	1.7	2.6	8.4	2.4	3.6	4.0	5.8	2.0	
30.....	1.7	2.6	8.4	2.4	3.6	4.0	4.6	2.0	
31.....	1.7	-----	6.8	-----	6.1	-----	7.4	1.3	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1.7	1.0	1.24	76
November.....	4.8	1.7	2.93	174
March 28-31.....	8.4	6.8	7.60	60
April.....	6.8	2.4	3.69	220
May.....	6.8	.4	2.36	145
June.....	111	.4	11.2	666
July.....	7.4	1.0	3.65	224
August.....	7.4	1.3	3.63	223
September.....	-----	1.3	2.10	125

## 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 September 1932.

EXTREMES.—1930-32: Maximum discharge, 4,740 second-feet June 8, 1932 (gage height, 9.30 feet); no flow for long periods.

REMARKS.—Records fair except those of discharge above 300 second-feet, which are poor. Diversions for storage on tributaries and for irrigation.

## Discharge, in second-feet, 1931-32

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0		1.6	2.6	0	9.06	0.8	1.3
2	0		1.6	2.6	2.1	4.8	0	.8
3	0		1.6	.7	2.5	4.8	0	.5
4	0		1.6	.7	2.9	4.8	0	0
5	0		1.6	333	1.6	4.8	0	0
6	0		3.8	16	2.1	2.7	0	0
7	0	2.5	2.6	2.6	4.6	2.7	0	0
8	0		2.0	2.6	1,830	2.7	0	0
9	0		1.6	1.6	2,950	2.1	0	0
10	0		1.6	.7	3,920	2.1	0	.5
11	0		.7	.7	3,620	1.7	505	.5
12	0		.2	0	1,280	1.7	47	0
13	0		0	5.1	532	1.7	21	0
14	0		0	.7	80	237	3.1	0
15	0	3.8	0	0	87	27	1.5	0
16	0	3.8	0	0	2,880	14	1.3	0
17	0	6.4	.6	0	690	5.4	1.3	0
18	0	3.8	.5	0	282	5.4	.6	0
19	0	3.8	0	0	114	2.7	.3	0
20	0	3.8	0	0	50	4.4	0	0
21	0	3.8	0	0	35	198	0	0
22	0	3.8	0	0	25	73	0	0
23	0	3.8	0	0	12	7.4	.8	0
24	0	2.2	.7	0	185	8.0	0	0
25	0	3.8	.7	0	70	5.4	0	0
26	0	3.8	.7	0	21	4.0	0	0
27	0	2.6	.7	0	12	3.5	0	0
28	3.8	.7	1.6	0	15	1.7	0	0
29	3.8	.7	7.7	0	12	.6	0	0
30		.7	2.6	0	0	0	1.9	0
31		1.6		0		0	1.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February 28-29	3.8	3.8	3.80	15
March	6.4	.7	2.84	175
April	7.7	0	1.21	72
May	333	0	11.9	732
June	3,920	0	625	37,200
July	237	0	20.8	1,280
August	505	0	18.9	1,160
September	1.3	0	.12	7.1
The year	3,920	0	559	40,600

NOTE.—No flow from June 6, 1930, to Feb. 27, 1932.

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 562 second-feet June 9 (gage height, 20.40 feet); no flow at various times.

1930-32: Maximum discharge, that of June 9, 1932; no flow at various times.

REMARKS.—Records fair. No record Jan. 1 to Mar. 15. Numerous diversions.

*Discharge, in second-feet, 1932*

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		0.4	1.0	0.8	12	3.0	0
2.....		.3	.8	.8	11	4.2	0
3.....		.4	.8	1.0	11	4.2	0
4.....		.2	.8	1.0	9.5	6.8	0
5.....		6.0	4.2	1.0	9.5	6.8	0
6.....		9.2	3.0	4.2	6.8	8.0	0
7.....		.3	2.0	29	5.5	6.8	0
8.....		.4	2.0	291	4.2	5.2	0
9.....		.5	2.0	562	3.0	3.8	.8
10.....		.6	1.0	512	3.0	3.5	4.2
11.....		.7	.8	462	3.0	2.2	4.2
12.....		.6	1.0	412	3.0	1.0	4.2
13.....		.8	2.0	318	3.0	.7	4.2
14.....		.4	2.0	163	66	.4	2.0
15.....		0	.5	63	33	.1	1.0
16.....	0.4	0	.5	54	14	0	.5
17.....	.4	.1	.5	242	8.0	0	0
18.....	.4	0	.5	163	5.5	.2	0
19.....	.4	.3	.5	163	5.5	0	0
20.....	.4	.4	.5	66	16	0	0
21.....	.4	.8	.5	48	14	0	0
22.....	.6	.8	.8	33	12	0	0
23.....	.6	1.0	.8	33	11	.2	0
24.....	.6	1.0	.5	31	9.5	.2	0
25.....	.4	1.0	.8	25	8.0	0	0
26.....	.4	.8	.8	21	5.5	0	0
27.....	.2	.8	.8	16	3.0	0	0
28.....	.1	.8	.5	14	3.0	0	0
29.....	.2	1.0	.5	12	3.0	0	0
30.....	.2	1.0	.5	8.0	3.0	0	0
31.....	.3		.8		3.0	0	
Month	Maximum	Minimum	Mean	Run-off in acre-feet			
March 16-31.....	0.6	0.1	0.38	12			
April.....	9.2	0	1.02	61			
May.....	4.2	.5	1.09	67			
June.....	562	.8	125	7,440			
July.....	66	3.0	9.92	610			
August.....	8.0	0	1.85	114			
September.....	4.2	0	.70	42			

NOTE.—No flow October to December.

## FLATWILLOW CREEK NEAR FLATWILLOW, MONT.

LOCATION.—Chain gage in NE  $\frac{1}{4}$  sec. 19, T. 12 N., R. 25 E., on Flatwillow Land & Livestock Co.'s ranch, 12 miles above Flatwillow.

DRAINAGE AREA.—195 square miles.

RECORDS AVAILABLE.—April 1918 to September 1932. May 1911 to April 1918 at station in sec. 23, T. 12 N., R. 25 E., 4 miles downstream.

EXTREMES.—Maximum discharge during year, 185 second-feet June 16 (gage height, 3.70 feet); no flow for long periods.

1911-32: Maximum discharge, 954 second-feet, old location, June 4-10, 1917 (gage height, 9.0 feet); no flow at various times.

REMARKS.—Records fair. Several diversions above station.

*Discharge, in second-feet, 1931-32*

Day	Apr.	May	June	July	Day	Apr.	May	June	July
1.....	0	11	0	31	16.....	0	20	145	.4
2.....	0	10	0	31	17.....	0	19	129	.4
3.....	17	11	0	31	18.....	0	19	87	.2
4.....	0	13	0	32	19.....	0	19	68	.2
5.....	0	12	.6	30	20.....	0	17	58	.9
6.....	0	16	2.8	28	21.....	0	16	58	.1
7.....	0	13	4.5	26	22.....	0	12	48	0
8.....	0	15	44	22	23.....	0	7.2	48	0
9.....	0	12	20	14	24.....	0	6.7	79	0
10.....	0	14	101	12	25.....	0	4.5	72	0
11.....	0	14	83	8.6	26.....	7.0	.5	62	0
12.....	0	14	76	5.4	27.....	9.2	.5	51	0
13.....	0	15	76	3.4	28.....	12.0	.5	48	0
14.....	0	16	72	2.2	29.....	8.1	0	40	0
15.....	0	18	62	.6	30.....	9.2	0	36	0
					31.....		0		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April.....	17	0	2.08	124
May.....	20	0	11.2	689
June.....	145	0	52.4	3,120
July.....	32	0	9.01	554
The year.....				4,490

NOTE.—No flow during months omitted.



## FLATWILLOW CREEK AT PETROLIA, MONT.

LOCATION.—Chain gage in NE¼ sec. 25, T. 14 N., R. 28 E., 2 miles above Box Elder Creek, 1 mile south of Petrolia, and 16 miles southeast of Winnett.

DRAINAGE AREA.—650 square miles.

RECORDS AVAILABLE.—June 1921 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 3,100 second-feet June 9 (gage height, 11.10 feet); no flow at various times.

1921-32: Maximum discharge, 3,700 second-feet July 5, 1923 (gage height, 12.94 feet); no flow at various times.

REMARKS.—Records fair. Numerous diversions. No records during January and February.

*Discharge, in second-feet, 1931-32*

Day	May	June	July	Aug.	Day	May	June	July	Aug.
1.....	0	0	10	13.0	16.....	0	12	12	0
2.....	0	0	10	2.2	17.....	0	10	4.6	0
3.....	0	0	10	1.1	18.....	0	158	4.6	0
4.....	0	0	417	0	19.....	0	106	4.6	0
5.....	740	0	165	0	20.....	0	57	248	0
6.....	9.5	0	19	0	21.....	0	57	214	0
7.....	1.6	0	13	0	22.....	0	26	13	0
8.....	0	397	8.0	0	23.....	0	25	5.0	10
9.....	0	3,100	6.8	0	24.....	0	26	3.4	78
10.....	0	497	5.6	0	25.....	0	93	2.2	1.8
11.....	0	2,600	93.0	8.0	26.....	0	266	1.8	0
12.....	0	59	3.8	1.6	27.....	0	75	0	0
13.....	0	80	4.2	0	28.....	0	45	0	0
14.....	0	19	1,600	0	29.....	0	22	0	0
15.....	0	16	22	0	30.....	0	20	0	0
					31.....	0		0	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May.....	740	0	24.2	1,490
June.....	3,100	0	259	15,400
July.....	1,600	0	93.6	5,760
August.....	78	0	3.71	228

NOTE.—No flow during October to December, March, April, and September.

## 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 1932. April 1905 to October 1930 at location 5 miles south of international boundary.

EXTREMES.—Maximum discharge during year, 435 second-feet May 5 (gage height, 2.78 feet); minimum, 0.4 second-foot Aug. 11 (gage height, 0.79 foot).  
1905-32: Maximum stage, 15.4 feet June 6, 1908 (discharge not determined); no flow at times during 1919 and 1931.

REMARKS.—Records good. No records Nov. 1 to Mar. 31. 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, 1931-32*

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	11.3	250	98	105	28.7	1.6	10.5
2	9.7	214	96	125	28.7	1.4	10.5
3	10.2	183	90	135	25.6	1.2	10.0
4	9.2	140	103	108	33.6	1.2	9.4
5	9.2	103	341	85	32.4	.9	8.9
6	9.7	87	304	75	36.1	.9	8.9
7	9.7	79	197	85	33.6	.7	8.4
8	8.6	73	155	92	26.6	.7	6.3
9	8.6	69	143	105	21.8	.5	5.8
10	9.2	81	136	105	18.0	.5	5.1
11	9.2	79	129	108	18.0	1.0	4.0
12	9.7	77	124	101	17.3	3.7	4.0
13	8.6	85	114	85	16.6	2.6	3.7
14	8.1	87	110	74	15.2	2.6	3.2
15	8.6	108	117	71	13.1	7.4	2.9
16	8.6	108	112	87	12.4	6.8	2.9
17	8.6	85	101	145	11.7	5.4	2.4
18	8.1	87	90	131	11.0	4.0	1.9
19	8.6	92	87	94	10.5	4.0	1.9
20	9.7	87	92	74	8.9	4.4	1.6
21	8.6	87	110	65	8.4	28.2	1.8
22	8.6	114	167	56	7.9	13.1	1.9
23	8.1	103	183	53	7.4	20.8	2.1
24	11.3	114	143	47.4	6.3	34.9	2.6
25	9.7	141	114	42.8	5.8	37.3	3.7
26	9.7	160	101	41.3	4.7	32.4	5.1
27	10.8	145	94	39.8	4.4	24.6	5.8
28	10.8	112	90	38.6	3.4	18.0	5.8
29	10.2	108	90	34.9	2.4	15.9	5.4
30	9.7	103	87	32.4	2.4	13.1	5.8
31	10.8	-----	87	-----	1.9	11.0	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	11.3	8.1	9.40	578
April	250	69	112	6,660
May	341	87	129	7,930
June	145	32.4	81.5	4,850
July	36.1	1.9	15.3	941
August	37.3	.5	9.70	596
September	10.5	1.6	5.08	302

## 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 1932. Prior to October 1920 station maintained by Department of the Interior, Canada.

EXTREMES.—Maximum discharge during year, 1,220 second-feet May 5 (gage height, 3.95 feet); minimum, 7.5 second-feet Feb. 15.

1909-32: Maximum discharge, 7,460 second-feet May 22, 1927 (gage height, 11.41 feet); no flow at various times during 1922, 1923, 1927.

REMARKS.—Records good except those for period of ice effect, Nov. 10 to Mar. 23, which are fair. 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, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	20.7	171	16.8	18.1	11.6	402	424	644	666	628	600	584
2.	22.0	135	18.1	16.8	11.6	124	650	633	772	633	595	574
3.	20.7	129	18.1	18.1	11.6	63	409	644	796	655	600	563
4.	18.1	127	18.1	19.4	11.6	88	271	644	748	655	606	563
5.	16.8	127	19.4	19.4	11.6	63	193	831	701	650	606	552
6.	19.4	124	19.4	20.7	11.6	103	148	1,120	511	616	611	547
7.	22.0	124	20.7	20.7	11.6	121	124	882	321	616	611	537
8.	22.0	127	22.0	19.4	11.6	91	105	748	328	606	595	531
9.	20.7	91.0	22.0	19.4	12.6	110	97	701	279	595	589	521
10.	20.7	46.4	20.7	20.7	12.9	132	91	678	405	589	584	476
11.	20.7	30.0	18.1	19.4	12.9	121	94	666	633	579	595	396
12.	23.6	22.0	18.1	16.8	14.2	86	91	655	672	579	589	342
13.	26.8	31.6	16.8	19.4	14.2	116	97	644	655	589	584	228
14.	26.8	23.6	14.2	19.4	19.4	129	102	622	628	600	589	145
15.	30.0	11.6	11.6	20.7	7.5	168	120	628	622	595	600	58
16.	31.6	23.6	11.6	19.4	22.0	121	173	644	655	589	606	48.7
17.	31.6	30.0	11.6	19.4	8.1	159	298	644	784	600	611	40.3
18.	31.6	28.4	10.3	22.0	10.3	223	378	638	778	600	622	34.0
19.	30.0	22.0	9.0	22.0	10.3	251	442	622	672	600	628	38.2
20.	31.6	14.2	11.6	22.0	15.5	595	505	584	622	600	644	34.0
21.	30.0	15.5	11.6	22.0	16.8	667	542	650	589	611	695	34.0
22.	30.0	12.9	11.6	22.0	14.2	743	595	808	563	616	701	30.2
23.	26.8	14.2	12.9	22.0	63	460	672	921	547	611	689	26.4
24.	25.2	10.3	14.2	22.0	230	542	650	820	531	616	701	24.5
25.	72.0	10.3	15.5	20.7	255	409	689	736	547	622	678	22.6
26.	196	10.3	15.5	20.7	402	391	736	718	579	616	650	20.7
27.	210	10.3	15.5	19.4	1000	391	706	712	628	611	628	24.5
28.	219	10.3	15.5	16.8	500	302	655	712	633	611	616	24.5
29.	216	11.6	17.5	15.5	450	161	633	695	633	611	595	22.6
30.	226	15.5	18.1	14.2	-----	117	644	661	633	611	589	24.5
31.	200	-----	18.1	12.9	-----	264	-----	650	-----	611	584	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	226	16.8	62.5	3,840
November	171	10.3	52.0	3,090
December	22	9.0	15.9	978
January	22	12.9	19.4	1,190
February	1,000	7.5	110	6,330
March	743	63	249	15,300
April	736	91	378	22,500
May	1,120	584	708	43,500
June	796	279	603	35,900
July	655	579	610	37,500
August	701	584	619	38,100
September	584	20.7	236	14,000
The year	1,120	7.5	306	222,000

## 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 Rudard, Mont., and 37 miles south of Many Berries, Alberta. Zero of gage is 2,698.92 feet above mean sea level.

**DRAINAGE AREA.**—2,514 square miles.

**RECORDS AVAILABLE.**—April 1913 to September 1932. From August 1909 to November 1912 maintained by Irrigation Branch, Department of the Interior, Canada.

**EXTREMES.**—Maximum discharge during year, 5,210 second-feet Mar. 24 (gage height, 6.63 feet); minimum, 20.5 second-feet Oct. 25 (gage height, 0.25 foot). 1909-32: Maximum discharge, 12,000 second-feet May 23, 1927 (gage height, 10.16 feet); no flow at times in 1914, 1922, and 1923.

**REMARKS.**—Records good except those for period of ice effect, Mar. 2-23, which are fair. No records Nov. 1 to Mar. 2. 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, 1931-32

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	42.0		230	614	678	574	597	543
2.	40.0	776	366	620	714	569	558	528
3.	36.0	399	1,160	631	772	552	547	518
4.	32.0	186	649	614	831	637	542	518
5.	36.0	135	481	637	810	637	536	513
6.	32.0	90	377	660	760	643	542	513
7.	32.0	60	293	945	777	602	552	513
8.	30.4	40	252	975	864	606	569	518
9.	30.4	40	250	790	769	602	563	584
10.	30.4	40	200	714	637	614	542	446
11.	30.4	40	178	684	660	602	620	460
12.	28.8	40	166	654	553	591	536	434
13.	28.8	45	155	643	656	580	490	441
14.	27.2	58	146	654	872	631	510	391
15.	28.0	60	146	660	817	726	510	222
16.	28.0	70	141	649	1,420	614	505	184
17.	28.0	77	141	637	1,880	591	521	178
18.	27.2	111	204	631	1,840	586	521	156
19.	26.4	171	266	649	1,170	574	526	133
20.	25.6	198	334	666	961	574	558	104
21.	24.0	230	586	690	864	569	631	84
22.	24.0	320	838	702	762	558	758	76
23.	24.0	362	773	708	666	586	876	62
24.	24.0	1,190	708	714	660	608	631	57
25.	20.5	536	696	945	625	614	597	54
26.	24.0	430	684	771	558	614	572	53
27.	25.6	404	672	745	542	602	547	53
28.	24.0	312	684	745	542	602	563	49.0
29.	21.2	266	625	739	558	574	563	43.6
30.	136.0	255	614	732	558	574	538	41.2
31.	153.0	312		739		602	558	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	153	20.5	36.1	2,220
March 2-31	1,190		242	14,400
April	1,160	141	433	25,800
May	975	614	708	43,500
June	1,890	542	802	47,700
July	726	552	600	36,900
August	876	490	570	35,000
September	584	41.2	284	16,900

## MILK RIVER ABOVE HAVRE, MONT.

LOCATION.—Water-stage recorder in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T. 33 N., R. 15 E., a quarter of a mile above Big Sandy Creek and 6 miles west of Havre.

RECORDS AVAILABLE.—May 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 2,520 second-feet June 17 (gage height, 6.15 feet); minimum, 15.6 second-feet Oct. 30 (gage height, 2.22 feet).

1928-32: Maximum discharge, 2,540 second-feet June 21, 1928; maximum gage height, that of June 17, 1932; minimum discharge, that of Oct. 30, 1931.

REMARKS.—Records good. No records Nov. 26 to Mar. 15, Mar. 17 to Apr. 5. Discharge interpolated Apr. 7-11. No diversions. Flow increased by diversion from St. Mary River during irrigation season.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	41	17	-----	-----	577	704	570	632	508
2.....	34	90	-----	-----	558	697	610	593	463
3.....	32	135	-----	-----	577	711	636	529	448
4.....	32	131	-----	-----	655	648	704	498	453
5.....	30	133	-----	-----	795	725	697	493	443
6.....	27	127	-----	395	622	810	732	503	443
7.....	26	117	-----	354	655	832	642	514	463
8.....	26	112	-----	313	788	870	622	534	458
9.....	26	110	-----	272	938	1,020	610	582	468
10.....	25	108	-----	231	767	1,060	610	638	498
11.....	24	107	-----	190	739	1,060	622	672	478
12.....	23	106	-----	148	725	855	584	677	409
13.....	23	104	-----	174	648	718	538	615	376
14.....	23	104	-----	156	577	690	495	577	348
15.....	22	66	-----	181	577	697	551	529	334
16.....	22	71	• 23	140	577	767	584	468	371
17.....	21	42	-----	145	564	1,670	532	463	267
18.....	21	57	-----	150	558	1,580	448	488	199
19.....	20	60	-----	134	584	1,150	513	514	147
20.....	20	49	-----	156	610	1,020	489	545	139
21.....	19	44	-----	226	718	885	483	577	125
22.....	18	35	-----	375	870	767	503	610	108
23.....	17	31	-----	610	690	662	519	724	96
24.....	17	30	-----	725	642	610	524	724	84
25.....	17	32	-----	753	746	610	519	566	76
26.....	17	-----	-----	739	818	596	529	514	70
27.....	16	-----	-----	711	746	610	545	555	67
28.....	16	-----	-----	636	704	570	545	582	61
29.....	16	-----	-----	642	683	513	540	572	56
30.....	16	-----	-----	629	669	519	572	561	55
31.....	16	-----	-----	-----	669	-----	588	540	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	41	16	22.7	1,400
November 1-25.....	135	17	80.7	4,000
April 6-30.....	753	134	367	18,200
May.....	938	558	679	41,800
June.....	1,670	513	821	48,900
July.....	732	448	570	35,000
August.....	724	463	567	34,900
September.....	508	55	282	16,800

• Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 7,010 second-feet June 14 (gage height, 22.78 feet); minimum, 3 second-feet May 26–30 (gage height, 3.23 feet).

1915–20, 1928–32: Maximum discharge, 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 good except those for period of ice effect, Mar. 8 to Apr. 1, which are fair. No record Jan. 1 to Feb. 7. 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, 1931–32

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	13	34		340	905	1,820	9	250	7	472
2	13	13	40		303	1,150	1,280	174	285	7	378
3	13	13	70		422	1,760	1,250	285	180	7	358
4	13	13	55		498	2,550	940	303	180	7	268
5	13	13	43		399	1,850	940	216	180	7	268
6	13	13	34		399	1,180	800	168	145	7	268
7	13	13	29		525	1,060	498	183	131	7	165
8	13	13	24		1,510	870	340	870	180	7	162
9	13	13	24		1,380	1,030	250	1,650	180	7	153
10	13	13	24		1,150	1,320	250	2,290	131	7	159
11	13	13	24		870	744	250	3,660	131	8	159
12	13	13	20		445	408	250	5,890	131	12	103
13	13	13	20		340	800	268	6,660	131	117	103
14	13	13	20		340	640	268	6,970	131	233	103
15	13	13	20		233	576	303	6,220	131	129	103
16	13	966	20		190	422	321	5,670	131	93	105
17	13	77	20		203	378	145	4,050	131	75	108
18	13	45	20		162	340	140	2,420	131	67	108
19	13	45	20		168	285	140	1,970	131	67	112
20	13	45	20		233	233	126	1,910	108	71	112
21	13	34	20		233	156	108	1,910	87	71	112
22	13	34	20		233	150	115	1,510	87	108	117
23	13	34	20		250	150	99	2,060	40	126	117
24	13	34	20		321	200	99	1,650	13	156	112
25	13	34	20		680	576	33	1,560	9	233	112
26	13	34	20		940	1,030	3	1,380	4	233	112
27	13	34	20		940	1,250	3	600	4	216	112
28	13	34	20	525	1,030	1,380	3	117	4	203	112
29	13	34	20	600	970	1,220	3	121	4	760	112
30	13	34	20		940	1,590	3	209	4	1,760	112
31	13		20		680		4		6	1,090	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	16	13	13.1	806
November	966	13	57.1	3,400
December	70	20	25.8	1,590
March	1,510	162	559	34,400
April	2,550	150	873	51,900
May	1,820	3	357	22,000
June	6,970	9	2,100	125,000
July	285	4	109	6,700
August	1,760	7	190	11,700
September	472	103	163	9,700

## 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 1932. Records obtained at this station only during period when St. Mary Canal is in operation.

EXTREMES.—Maximum discharge during year, 78 second-feet June 16 (gage height, 1.33 feet); minimum, 6.2 second-feet July 29 (gage height, 0.39 foot).

1927-32: Maximum discharge, 363 second-feet May 29, 1927 (gage height, 4.93 feet); minimum, that of July 29, 1932.

REMARKS.—Records good. No record Nov. 1 to May 7, Sept. 17-30. No diversions or regulations. 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, 1931-32*

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	11.5		36.0	9.8	6.7	10.3	16	12.6	23.0	43.6	9.8	10.3	9.2
2	11.5		27.4	10.3	6.7	10.3	17	12.9	21.1	24.4	9.2	10.8	
3	11.5		20.4	11.8	6.7	9.8	18	12.9	22.3	15.6	9.8	9.8	
4	11.5		17.9	15.6	6.7	9.8	19	12.9	23.6	14.0	10.3	10.8	
5	11.8		16.2	14.0	7.2	9.8	20	12.9	24.4	12.9	9.8	11.8	
6	12.2		16.2	11.8	8.7	9.8	21	13.7	30.4	12.4	9.2	12.9	
7	11.8		17.9	10.8	8.7	9.2	22	13.3	42.7	12.4	9.2	12.9	
8	11.8	36.8	16.2	10.3	7.7	8.7	23	13.3	25.1	12.4	8.2	14.6	
9	12.2	36.8	16.2	10.8	7.7	8.7	24	13.3	20.4	11.3	8.2	15.1	
10	12.2	36.0	16.8	10.3	8.2	9.8	25	13.7	18.6	11.8	7.7	12.9	
11	12.2	33.6	15.1	9.8	11.8	9.2	26	13.7	17.9	11.8	7.7	11.8	
12	12.2	32.7	14.0	9.2	10.8	9.2	27	13.7	16.8	12.4	7.7	11.3	
13	12.6	31.9	13.4	9.2	10.3	9.2	28	13.3	16.8	10.8	7.2	10.3	
14	12.6	31.9	12.4	10.3	10.3	8.2	29	13.3	16.8	10.8	6.7	10.3	
15	12.6	26.6	14.0	9.8	10.3	8.7	30	13.7	18.6	10.3	6.7	11.3	
							31	13.7	18.6		7.2	10.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13.7	11.5	12.7	781
May 8-31	42.7	16.8	26.0	1,240
June	43.6	10.3	16.6	988
July	15.6	6.7	9.63	592
August	15.1	6.7	10.2	627
September 1-16	10.3	8.2	9.37	297

## 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 1932. July 1909 to December 1912 at station in NE¼ sec. 13, T. 1, R. 23 W. fourth meridian, about 2 miles downstream; May 1911 to December 1912 at station 2 miles south of international boundary.

EXTREMES.—Maximum discharge during year, 708 second-feet June 16 (gage height, 4.15 feet); minimum, 9.8 second-feet Oct. 11 (gage height, 1.76 feet).

1909-32: Maximum discharge, 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, Mar. 1-30, which are fair. No records Nov. 10 to Feb. 29. 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, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10.7	94	298	196	492	623	603	591	537
2	10.7	94	238	82	492	533	611	591	537
3	10.4	88	220	56	492	563	615	595	537
4	10.4	88	196	44.0	591	537	623	591	540
5	10.7	83	75	40.4	579	252	615	587	540
6	10.4	85	51	36.0	522	63	603	591	537
7	10.4	51	33.0	34.0	510	37	603	591	537
8	10.4	23.3	23.0	35.0	503	84	599	595	537
9	10.1	22.6	18.0	33.0	503	416	585	591	497
10	10.1		15.0	31.0	503	507	587	591	374
11	9.8		12.0	30.0	503	533	583	603	266
12	10.1		10.0	29.0	510	533	579	599	123
13	10.1		13.0	36.0	510	533	583	595	34.0
14	10.4		13.0	107	514	533	587	595	20.0
15	10.4		16.0	178	529	540	579	591	19.4
16	10.4		10.0	262	540	639	575	587	18.8
17	10.4		10.0	346	559	571	579	587	18.2
18	10.4		18.0	402	507	533	583	587	17.6
19	10.4		203	432	514	522	591	587	13.6
20	10.4		234	463	567	518	591	595	11.6
21	10.7		29.0	480	623	507	591	603	12.0
22	10.7		66	496	635	503	591	611	12.4
23	292		97	510	591	499	591	611	12.4
24	196		105	525	595	499	591	579	12.0
25	192		42.0	515	607	525	595	552	11.6
26	203		42.0	505	611	552	591	544	11.6
27	206		31.0	496	607	567	595	540	11.6
28	206		29.0	498	559	571	599	537	11.6
29	206		30.0	499	522	583	599	537	11.2
30	189		34.0	496	514	583	591	537	11.2
31	116		45.2	-----	529	-----	599	540	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	292	9.8	65.6	4,030
November 1-9	94	22.6	69.9	1,250
March	298	10.0	72.8	4,480
April	525	29	263	15,600
May	611	492	543	33,400
June	639	37	484	28,800
July	623	575	594	36,500
August	611	537	582	35,800
September	540	11.2	193	11,500



## BIG SANDY CREEK NEAR BOX ELDER, MONT.

LOCATION.—Staff gage in NE¼ sec. 13, T. 30 N., R. 13 E., at Cowan ranch, 3 miles north of Box Elder.

RECORDS AVAILABLE.—March 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 150 second-feet Aug. 27 (gage height, 6.70 feet); minimum, 0.2 second-foot several days in October and November (gage height, 1.90 feet).

1928-32: Maximum discharge, 338 second-feet Mar. 25, 1928 (gage height, 10.96 feet); no flow Mar. 17, 1929.

REMARKS.—Records fair. Discharge estimated Nov. 16, 17 because of ice effect. No records Nov. 21 to Mar. 27, Mar. 29-31. Flow regulated by storage in Cowan Reservoir. Small diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0.3	0.2	-----	0.6	0.5	2.4	17.2	0.3	14.3
2.....	.3	.2	-----	.7	.5	2.8	15.5	.3	13.4
3.....	.3	.2	-----	1.2	.5	3.3	12.5	.3	12.9
4.....	.3	.2	-----	2.1	.5	3.8	10.8	.3	12.3
5.....	.3	.2	-----	3.5	.5	4.8	9.3	.3	10.3
6.....	.3	.2	-----	8.4	.5	6.3	8.1	.4	10.1
7.....	.3	.2	-----	.9	.5	8.6	6.7	.4	9.7
8.....	.3	.2	-----	.7	.5	11.0	5.4	.4	9.3
9.....	.3	.2	-----	.6	.5	12.9	4.2	.4	8.6
10.....	.3	.2	-----	.6	.5	15.3	3.2	.4	6.8
11.....	.3	.2	-----	.8	.5	16.5	2.4	.4	6.7
12.....	.3	.2	-----	.8	.6	19.7	1.5	.5	6.3
13.....	.3	.3	-----	.8	.6	22	.9	.5	6.2
14.....	.3	.3	-----	.6	.7	25	.6	.5	6.0
15.....	.3	.3	-----	.5	.7	39	.6	.4	6.3
16.....	.3	.3	-----	.5	.8	42	.6	.4	6.8
17.....	.2	.3	-----	.4	.8	49	.6	.4	7.2
18.....	.3	32	-----	.5	.9	63	.6	.4	7.4
19.....	.2	27	-----	.5	1.0	63	.6	.4	7.9
20.....	.2	18.2	-----	.5	1.0	63	.5	.4	7.4
21.....	.2	-----	-----	.6	1.0	56	.5	122	7.0
22.....	.2	-----	-----	.5	1.2	56	.4	122	6.7
23.....	.2	-----	-----	.5	1.3	59	.4	126	6.3
24.....	.2	-----	-----	.5	1.6	56	.4	130	6.0
25.....	.2	-----	-----	.5	1.6	56	.4	130	5.7
26.....	.2	-----	-----	.5	1.7	52	.5	138	6.2
27.....	.2	-----	-----	.5	1.8	49	.5	146	5.8
28.....	.2	-----	3.2	.5	1.8	46	.4	106	6.2
29.....	.2	-----	-----	.5	2.0	42	.4	56	6.5
30.....	.2	-----	-----	.5	2.0	24	.4	19.7	6.2
31.....	.2	-----	-----	-----	2.2	-----	.3	16.7	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	0.3	0.2	0.25	15
November 1-20.....	32	.2	4.06	161
April.....	8.4	.4	1.01	60
May.....	2.2	.5	.99	61
June.....	63	2.4	32.3	1,920
July.....	17.2	.3	3.43	211
August.....	146	.3	36.1	2,220
September.....	14.3	5.7	7.95	473

\* Result of discharge measurement.

## 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 1917 to September 1932. April 1910 to October 1916 maintained by Irrigation Branch, Department of the Interior, Canada.

EXTREMES.—Maximum discharge during year, 628 second-feet Apr. 3 (gage height, 5.66 feet); no flow at various times.

1917-32: Maximum discharge, 3,680 second-feet May 23, 1927 (gage height, 12.40 feet); no flow at various times usually after July 15 each year.

REMARKS.—Records good except those for period of ice effect, Mar. 2 to Apr. 2, which are fair. No records Nov. 1 to Jan. 31. 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, 1931-32*

Day	Feb.	Mar.	Apr.	May	June	Day	Feb.	Mar.	Apr.	May	June
1.....	0	327	146	4.6	0.4	16.....	0	3.4	7.9	1.5	8.8
2.....	0	235	386	3.6	.5	17.....	0	1.5	5.0	1.2	6.3
3.....	0	224	546	3.6	.4	18.....	0	1.2	3.9	.9	4.0
4.....	0	176	384	4.3	.4	19.....	0	2.2	3.2	.8	2.8
5.....	0	59	217	7.9	.4	20.....	0	1.8	2.8	.6	1.6
6.....	0	87	130	7.0	.4	21.....	0	1.5	2.8	.5	1.2
7.....	0	60	93	36.4	.3	22.....	0	2.0	3.0	.5	2.4
8.....	0	.80	55	37.2	.3	23.....	0	19.4	3.6	.4	2.6
9.....	0	101	39.5	21.1	9.3	24.....	0	152	8.6	.3	1.3
10.....	0	40.3	30.7	13.1	16.6	25.....	0	247	4.6	.3	.9
11.....	0	13.6	23.5	8.4	12.6	26.....	8.0	220	5.0	.3	.5
12.....	0	59.0	19.4	5.6	9.8	27.....	7.9	100	6.0	.3	.4
13.....	0	40.3	14.1	3.9	21.1	28.....	3.6	60	12.1	.3	.3
14.....	0	17.2	9.8	3.0	13.1	29.....	544	61	8.8	.3	.2
15.....	0	7.5	10.7	2.2	7.9	30.....		60	6.0	.3	.1
						31.....		54		.3	
Month						Maximum	Minimum	Mean	Run-off in acre-feet		
February.....						544	0	19.4	1,120		
March.....						327	1.2	81.1	4,990		
April.....						546	2.8	72.8	4,330		
May.....						37.2	.3	5.51	339		
June.....						21.1	.1	4.23	252		
The period.....									11,000		

NOTE.—No flow during October and July to September.

## McREA COULEE AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.—Water-stage recorder in NW¼ sec. 5, T. 1, R. 28 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 1932.

EXTREMES.—Maximum discharge during year, 12.7 second-feet Mar. 24 (gage height, 2.35 feet); no flow during most of year.

1927-32: Maximum discharge, 486 second-feet May 23, 1927 (gage height, 5.74 feet); no flow at various times.

REMARKS.—Records fair. No records Nov. 1 to Feb. 29. No regulation or diversion. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Water 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, 1931-32*

Mar. 22.....	1.6	Mar. 27.....	2.5	Apr. 1.....	1.2
23.....	2.3	28.....	1.6	2.....	.5
24.....	2.3	29.....	.7	3.....	.4
25.....	3.1	30.....	1.0	4.....	.2
26.....	2.8	31.....	.4		

NOTE.—No flow during October, Mar. 1-21, Apr. 5 to Sept. 30. Run-off in acre-feet for March, 36; for April, 4.8.

## 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 1932.

REMARKS.—Records good. No records Nov. 1 to Feb. 29. 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, 1931-32*

Day	Mar.	Apr.	May	June	Day	Mar.	Apr.	May	June
1.....	85	65	6.4	0	16.....	0	10.2	3.3	20
2.....	97	85	7.2	0	17.....	0	7.1	2.6	16.2
3.....	89	89	6.5	0	18.....	62	7.1	1.8	10.8
4.....	85	93	5.3	0	19.....	51	7.1	1.4	7.0
5.....	51	81	5.0	0	20.....	30	5.4	1.2	6.4
6.....	48	58	4.3	0	21.....	13.4	4.6	1.1	5.0
7.....	33	48	4.1	0	22.....	42	4.4	.8	3.1
8.....	24	48	4.4	.9	23.....	65	5.0	.6	2.0
9.....	11.2	44	32	3.2	24.....	51	5.4	.1	2.0
10.....	2.3	38	32	13.6	25.....	51	5.4	0	1.3
11.....	0	34	19.6	17.0	26.....	93	5.4	0	.5
12.....	0	30	12.3	32	27.....	81	5.2	0	0
13.....	0	23	8.2	30	28.....	56	4.2	0	0
14.....	0	17.7	5.2	19.6	29.....	58	4.0	0	0
15.....	0	13.9	3.9	18.2	30.....	60	4.1	0	0
					31.....	58		0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March.....	97	0	41.8	2,570
April.....	93	4.0	28.4	1,690
May.....	32	0	5.46	336
June.....	32	0	6.96	414
The period.....				5,010

NOTE.—No flow during October, July to September.

## 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 1932.

**EXTREMES.**—Maximum discharge during year, 418 second-feet Apr. 6 (gage height, 4.10 feet); no flow at various times.

1917-32: Maximum discharge, 3,200 second-feet Apr. 13, 1917 (gage height, 8.50 feet); no flow at various times.

**REMARKS.**—Records good except those for period of ice effect, Mar. 1-31, which are fair. No records Nov. 1 to Feb. 29. 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, 1931-32

Day	Mar.	Apr.	May	June	July	Sept.	Day	Mar.	Apr.	May	June	July	Sept.
1-----	50	121	46	25	7.0	0	16-----	0.5	44	28	32	10.1	0
2-----	100	126	44	24	6.6	0	17-----	.5	37	26	26	8.3	0
3-----	236	100	44	27	6.1	0	18-----	.5	32	26	22	7.8	0
4-----	50	103	43	21	7.0	0	19-----	.5	37	32	20	6.1	0
5-----	40	180	46	30	7.4	0	20-----	.5	37	31	15.5	4.8	0
6-----	30	359	48	30	6.1	0	21-----	2	35	26	15.5	3.9	0
7-----	20	222	50	31	5.3	0	22-----	5	33	23	14.1	3.0	0
8-----	10	158	51	33	4.4	0	23-----	10	34	21	12.8	1.7	0
9-----	8	112	73	94	3.6	0	24-----	29	37	25	14.1	1.2	0
10-----	6	80	64	67	3.9	0	25-----	30	40	25	12.8	.8	0
11-----	4	84	54	57	2.8	0	26-----	80	94	25	12.1	.6	0
12-----	3	65	46	38	19	0	27-----	43	84	25	10.8	.5	0
13-----	2	62	41	32	14.8	0	28-----	50	69	24	9.5	.2	0
14-----	1	56	39	31	12.1	0	29-----	50	60	21	8.3	0	1.4
15-----	1	46	29	37	13.5	0	30-----	75	54	22	7.0	0	5.3
							31-----	90	-----	25	-----	.2	-----
Month						Maximum	Minimum	Mean	Run-off in acre-feet				
March-----						236	0.5	31.5	1,940				
April-----						359	32	86.7	5,160				
May-----						73	21	36.2	2,230				
June-----						94	7.0	27.0	1,610				
July-----						19.0	0	5.45	34				
September-----						5.3	0	.22	13				

**NOTE.**—No flow during October and August.

## 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 and 1½ miles south of international boundary.

DRAINAGE AREA.—70 square miles.

RECORDS AVAILABLE.—March 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 45.7 second-feet Mar. 23 (gage height, 2.82 feet); no flow during most of year.

1927-32: Maximum discharge, 423 second-feet Apr. 4, 1927 (gage height, 16.69 feet at old gage); no flow at various times.

REMARKS.—Records fair. No records Nov. 1 to Feb. 29. 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, 1931-32*

Day	Mar.	Apr.	June	Day	Mar.	Apr.	June	Day	Mar.	Apr.	June
1.....	0	0.2	0	11.....	0	0	4.1	21.....	0.3	0	0
2.....	0	0	0	12.....	0	0	.9	22.....	.2	0	0
3.....	0	.2	0	13.....	0	0	.4	23.....	17.3	0	0
4.....	0	.2	0	14.....	0	0	.2	24.....	20.5	0	0
5.....	0	.1	0	15.....	0	0	.1	25.....	16.1	.3	0
6.....	0	.1	0	16.....	0	0	.1	26.....	11.6	.3	0
7.....	0	0	0	17.....	0	0	0	27.....	6.5	.2	0
8.....	0	0	0	18.....	0	0	0	28.....	3.5	.1	0
9.....	0	0	9.5	19.....	0	0	0	29.....	1.1	.1	0
10.....	0	0	6.0	20.....	0	0	0	30.....	1.1	0	0
								31.....	1.1		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March.....	20.5	0	2.56	157
April.....	.3	0	.06	3.6
June.....	9.5	0	.71	42

NOTE.—No flow during October, May, and July to September.

## EAST FORK OF BATTLE CREEK NEAR INTERNATIONAL BOUNDARY

(International gaging station)

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

DRAINAGE AREA.—98 square miles.

RECORDS AVAILABLE.—March 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 94 second-feet Mar. 25 (gage height, 2.90 feet); no flow at various times.

1927-32: Maximum discharge, 432 second-feet Apr. 1, 1928 (gage height, 5.48 feet); 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, 1931-32*

Day	Mar.	Apr.	June	Day	Mar.	Apr.	June	Day	Mar.	Apr.	June
1.....	0	5.2	0	11.....	0	0	32.1	21.....	0	0	0
2.....	0	10.2	0	12.....	0	0	7.8	22.....	0	0	0
3.....	0	4.9	0	13.....	0	0	2.6	23.....	0	2.0	0
4.....	0	2.6	0	14.....	0	0	2.0	24.....	24.5	13.7	0
5.....	0	1.2	0	15.....	0	0	2.0	25.....	94	8.4	0
6.....	0	.5	0	16.....	0	0	2.0	26.....	28.7	3.2	0
7.....	0	.2	0	17.....	0	0	1.6	27.....	13.2	1.4	0
8.....	0	.1	0	18.....	0	0	.2	28.....	11.3	.5	0
9.....	0	0	9.5	19.....	0	0	0	29.....	14.0	.2	0
10.....	0	0	54	20.....	0	0	0	30.....	11.3	.1	0
								31.....	8.2		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March.....	94	0	6.62	407
April.....	13.7	0	1.81	108
June.....	54	0	3.79	226
The year.....				741

NOTE.—No flow during months omitted.

## 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 1932.

EXTREMES.—Maximum discharge during year, 25 second-feet June 10 (gage height, 3.83 feet); no flow at various times.

1927-32: Maximum discharge, 668 second-feet Apr. 3, 1927 (gage height, 7.65 feet); no flow at various times.

REMARKS.—Records fair. 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.

*Discharge, in second-feet, 1931-32*

Mar. 26.....	0.03	Apr. 4.....	1.5	June 14.....	2.8
27.....	.6	5.....	.2	15.....	1.6
28.....	5.1	6.....	.09	16.....	.6
29.....	3.9	June 10.....	12.5	17.....	.2
30.....	.6	11.....	12.8	18.....	.1
31.....	.3	12.....	9.3		
Apr. 1.....	.09	13.....	4.9		

NOTE.—No flow during year except as given above. Run-off in acre-feet for March, 21; April, 3.6; June, 89.

## 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 1932.

REMARKS.—Records good. Canal diverts water from right bank of Battle Creek for irrigation of lands between Battle Creek and Milk River.

*Discharge, in second-feet, 1931-32*

Day	Apr.	May	June	Day	Apr.	May	June	Day	Apr.	May	June
1.....	0	7.6	2.2	11.....	5.5	2.5	4.2	21.....	8.5	0.2	0
2.....	0	7.0	1.2	12.....	13.4	2.0	1.0	22.....	11.3	.3	0
3.....	0	5.2	.6	13.....	19.0	1.8	.3	23.....	15.9	.7	0
4.....	0	5.0	.5	14.....	14.4	1.2	.1	24.....	17.0	.3	0
5.....	3.3	5.0	.4	15.....	21.0	.9	.1	25.....	18.3	.2	0
6.....	15.1	5.5	.4	16.....	18.7	.6	.1	26.....	22.2	.2	0
7.....	10.7	5.0	.3	17.....	15.9	.5	0	27.....	16.8	1.9	0
8.....	5.7	4.3	.2	18.....	13.1	.3	0	28.....	11.9	2.4	0
9.....	5.9	3.9	.9	19.....	10.3	.3	0	29.....	8.2	2.2	0
10.....	5.8	3.2	3.1	20.....	8.3	.2	0	30.....	7.6	1.6	0
								31.....		3.2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April.....	22.2	0	10.8	643
May.....	7.6	.2	2.43	149
June.....	4.2	0	.52	31
The year.....				823

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 1932.

EXTREMES.—Maximum discharge during year, 123 second-feet May 31 (gage height, 2.87 feet); no flow various times.

1927-32: Maximum discharge, 1,140 second-feet Apr. 5, 1927 (gage height, 4.71 feet); no flow at various times.

REMARKS.—Records fair. No record Nov. 1 to Feb. 29. Stage-discharge relation affected by ice Mar. 28 to Apr. 5. 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, 1931-32

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.	14	0	1.5	0.8	20.5	0	0	0.1	
2.	14	0	2.1	.6	2.3	0	0	.1	
3.	14	0	2.6	.5	.8	0	0	.1	
4.	14	0	3.5	.5	.5	.1	0	.1	
5.	14	0	4.6	.4	.8	.2	0	.1	
6.	14	0	2.9	.4	1.1	.2	0	.1	
7.	14	0	.4	.3	1.2	.2	0	.1	
8.	14	0	0	.3	1.1	.2	0	.1	
9.	14	0	0	.3	.9	.2	0	.1	
10.	6	0	0	.2	3.4	.2	0	.1	
11.	}	0	0	.2	2.4	.2	0	.1	
12.		0	0	.2	1.5	.2	0	.1	
13.		0	.1	.2	1.0	.3	0	.1	
14.		0	.1	.2	.8	.2	0	.1	
15.		0	.1	.3	.6	.1	0	.1	
16.		0	.2	.3	.6	.1	0	.1	
17.		0	.2	.2	.5	.1	0	.1	
18.		1.0	.2	.3	.3	.1	0	.1	
19.		1.4	.2	.2	.3	.1	0	.2	
20.		1.7	.3	.3	.3	0	0	.2	
21.		5	2.0	.4	.3	.2	0		.2
22.			3.8	.4	.3	.2	0	0	.2
23.			7.4	.9	.2	.1	0	0	.2
24.			7.1	1.7	.1	.1	0	0	.1
25.			4.8	1.5	.2	0	0	0	.2
26.	3.2		.9	.2	0	0	0	.1	
27.	3.4		.8	.2	0	0	0	.1	
28.	3.5		.7	.2	0	0	0	.1	
29.	2.4		.9	.2	0	0	0	.1	
30.	.9		.8	.3	0	0	.1	.1	
31		.9		10.6		0	.1		
Month	Maximum		Minimum		Mean	Run-off in acre-feet			
October	0.14				0.08	4.9			
March	7.4		0		1.40	86			
April	4.6		0		.93	55			
May	10.6		.1		.63	39			
June	20.5		0		1.38	82			
July	.3		0		.09	5.5			
August	.1		0		.01	.6			
September	.2		.1		.12	7.1			



## 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., in Montana.

DRAINAGE AREA.—1,875 square miles.

RECORDS AVAILABLE.—April 1917 to September 1932.

EXTREMES.—Maximum discharge during year, 1,260 second-feet Aug. 11 (gage height, 5.70 feet); no flow at times.

1917-32: Maximum discharge, 5,440 second-feet Mar. 29, 1925 (gage height, 13.12 feet); no flow at various times.

REMARKS.—Records good except those for period of ice effect, Mar. 1 to Apr. 7, which are fair. No record Nov. 1 to Feb. 29. 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 & Hydrometric Bureau, Department of the Interior, Canada.

*Discharge, in second-feet, 1931-32*

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	150	301	129	73	24	6.0	24
2.....	131	432	116	45	24	4.9	22
3.....	112	563	99	40	22	4.6	24
4.....	93	625	89	46	21	4.1	18
5.....	74	728	80	52	43	3.4	17
6.....	74	563	76	65	34	2.7	17
7.....	74	430	74	57	26	2.7	13
8.....	73	550	74	89	24	2.4	10
9.....	72	611	73	94	23	2.0	9.6
10.....	71	581	70	430	20	1.4	8.2
11.....	70	426	69	759	19	90	6.5
12.....	70	297	66	782	18	21.4	4.6
13.....	55	215	66	629	17	3.4	3.4
14.....	40	178	65	456	19	1.7	2.7
15.....	70	153	61	193	21	.4	2.0
16.....	39	136	56	146	22	0	2.4
17.....	34	126	53	124	20	0	2.2
18.....	30	118	50	114	19	0	1.7
19.....	26	111	48	103	17	0	1.2
20.....	23	105	46	89	15	0	.6
21.....	28	101	42	74	14	0	.3
22.....	34	98	40	62	14	0	.3
23.....	162	96	39	54	14	0	.2
24.....	289	94	39	54	12	14.1	.3
25.....	320	90	38	47	10	51	.3
26.....	490	90	37	42	10	66	.2
27.....	660	84	38	36	12	171	.2
28.....	576	82	37	34	11	179	.1
29.....	522	96	36	30	10	45	0
30.....	468	124	37	27	9.3	38	0
31.....	384	-----	64	-----	7.9	31	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March.....	660	23	171	10,500
April.....	728	82	273	10,200
May.....	129	36	61.5	3,780
June.....	782	27	162	9,640
July.....	43	7.9	18.5	1,140
August.....	181	0	22.1	1,360
September.....	24	0	6.40	381

NOTE.—No flow during October.

## 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 1932.

REMARKS.—Records good. Canal diverts from Frenchman River about 1 mile above gage for irrigation of land in Frenchman Valley.

*Discharge, in second-feet, 1931-32*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1-----	0	21.0	24.3	13.0	2.4	2.8	16-----	0	24.3	6.8	13.3	4.2	0
2-----	0	22.1	28.5	12.8	1.5	3.1	17-----	0	23.5	12.4	12.6	2.8	0
3-----	0	21.8	30.6	12.6	1.0	2.7	18-----	0	22.9	18.7	14.1	1.4	0
4-----	0	21.0	29.1	12.8	1.1	2.2	19-----	1.9	22.4	16.8	14.8	.2	0
5-----	0	20.0	29.1	13.3	.9	1.7	20-----	7.9	22.1	15.9	14.5	0	0
6-----	0	19.2	32.0	13.5	0	1.6	21-----	7.9	21.6	14.1	14.5	0	0
7-----	0	18.0	34.0	16.8	0	1.2	22-----	7.7	20.8	15.9	13.9	0	0
8-----	0	17.5	28.5	16.3	0	1.0	23-----	8.9	20.5	18.2	12.2	0	0
9-----	0	17.0	33.0	15.9	0	1.0	24-----	12.4	19.5	17.5	11.9	0	0
10-----	0	17.5	24.8	14.8	0	1.0	25-----	17.7	19.2	17.3	10.7	4.1	0
11-----	0	19.0	.5	14.5	0	.8	26-----	19.5	19.5	17.3	11.2	7.6	0
12-----	0	19.7	0	14.5	.6	.4	27-----	19.2	19.5	15.6	10.5	5.9	0
13-----	3.4	25.5	0	14.3	0	.3	28-----	17.7	20.8	15.0	9.8	9.4	0
14-----	0	25.2	0	14.3	6.3	.2	29-----	17.3	23.5	14.5	9.0	9.8	0
15-----	0	24.6	0	13.7	5.0	0	30-----	17.7	23.5	13.5	7.6	14.1	0
							31-----		24.6		4.2	4.0	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April-----	19.5	0	5.31	316
May-----	25.5	17.0	21.2	1,300
June-----	34	0	17.5	1,040
July-----	16.8	4.2	12.8	787
August-----	14.1	0	2.65	163
September-----	3.1	0	.67	40
The year-----				3,650

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 1932.

EXTREMES.—Maximum discharge during year, 169 second-feet Mar. 25 (gage height, 4.52 feet); no flow at various times.

1927-32: Maximum discharge, 982 second-feet Apr. 6, 1927 (gage height, 10.51 feet); no flow at various times.

REMARKS.—Records fair. No records Nov. 1 to Mar. 12. Stage-discharge relation affected by ice Mar. 13-22. 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, 1931-32*

Day	Oct.	Mar.	Apr.	May	June	July	Aug.
1.....	0	-----	° 27.3	4.9	46.8	0.4	° 0.6
2.....	0	-----	° 30.2	8.1	° 34.8	° .8	.3
3.....	0	-----	° 17.8	° 8.0	° 22.7	° 1.1	° .2
4.....	0	-----	° 30.2	° 7.8	10.6	° 1.5	° .1
5.....	0	-----	22.1	7.7	9.6	1.9	.1
6.....	0	-----	° 17.4	7.1	9.2	1.7	.1
7.....	0	-----	12.6	7.1	8.8	° 2.7	° .1
8.....	0	-----	12.8	° 5.8	19.7	3.7	0
9.....	0	-----	° 12.2	4.4	26.6	° 4.4	0
10.....	0	-----	11.5	3.7	21.4	5.1	0
11.....	.3	-----	° 11.2	° 3.6	14.0	5.1	0
12.....	.6	-----	10.8	3.6	11.9	3.9	0
13.....	.7	0.1	9.4	1.9	11.1	° 3.6	0
14.....	.8	2.6	9.4	7.3	10.6	3.2	0
15.....	.9	° 1.6	8.3	° 5.6	° 9.9	3.0	0
16.....	° 1.0	.5	7.5	4.0	° 9.2	2.4	0
17.....	1.0	0	° 7.4	° 3.5	8.5	° 2.3	0
18.....	1.0	0	7.3	3.0	6.9	2.2	0
19.....	1.0	0	6.8	° 2.8	° 5.4	2.5	0
20.....	1.1	2.6	6.8	° 2.5	° 3.9	2.3	0
21.....	° 1.1	2.0	° 6.2	° 2.2	2.4	° 2.2	0
22.....	1.1	4.4	5.6	1.9	° 1.5	2.2	0
23.....	° 1.2	137	6.4	° 1.7	.6	° 2.0	0
24.....	1.2	27.8	° 7.7	° 1.4	° .6	° 1.8	0
25.....	1.3	169	9.0	1.1	° .5	1.6	.1
26.....	1.5	107	° 9.0	° .8	° .5	1.8	0
27.....	1.5	74	9.0	° .5	° .4	° 1.7	0
28.....	1.5	43.0	° 9.2	.2	° .4	° 1.5	0
29.....	1.5	33.8	9.4	.2	° .5	1.4	0
30.....	1.5	21.4	8.8	.6	° .6	° 1.1	0
31.....	° 1.5	° 24.4	-----	3.6	-----	° .8	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1.5	0	0.75	46
March 13-31.....	169	0	34.3	1,290
April.....	30.2	5.6	12.0	714
May.....	8.1	.2	3.76	231
June.....	46.8	.4	10.3	613
July.....	5.1	.4	2.32	143
August.....	.6	0	.05	3.1

° 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.—March 1927 to September 1932; May 1914 to October 1926 maintained by Department of the Interior, Canada.

EXTREMES.—Maximum discharge during year, 56 second-feet Mar. 24 (gage height, 5.29 feet); no flow at various times.

1914-32: Maximum discharge, 1,040 second-feet Mar. 30, 1925 (gage height, 10.85 feet); no flow at various times.

REMARKS.—Records fair. No record Nov. 1 to Feb. 29. No diversions. Stage-discharge relation affected by ice during March. 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

Day	Mar.	Apr.	May	June	Day	Mar.	Apr.	May	June
1-----	20.0	22.5	0.01	* 0.02	16-----	0	0.01	0.01	0.03
2-----	2.7	25.2	.01	.04	17-----	0	0	*.01	*.03
3-----	6.5	*23.8	*.02	*.04	18-----	0	0	*.01	*.03
4-----	0	22.3	.04	*.04	19-----	0	0	.01	*.03
5-----	0	.9	.04	*.04	20-----	0	0	*.01	*.03
6-----	0	.3	.04	.04	21-----	0	0	*.01	.03
7-----	0	*.2	*.04	.06	22-----	0	0	.01	*.03
8-----	0	.2	*.04	*.1	23-----	15.8	.01	*.01	*.03
9-----	0	.2	.04	.5	24-----	35.6	*.01	.01	*.03
10-----	0	.1	.01	.3	25-----	34.0	.01	*.01	.03
11-----	0	*.08	.01	*.2	26-----	32.5	.01	.01	*.03
12-----	0	.07	.01	.06	27-----	23.0	.04	*.01	*.03
13-----	0	.01	*.01	.03	28-----	8.9	.04	*.01	0
14-----	0	.01	*.01	.03	29-----	34.6	.01	*.01	0
15-----	0	.01	*.01	*.03	30-----	16.3	.01	.01	0
					31-----	30.9		*.01	
Month					Maximum	minimum	Mean	Run-off in acre-feet	
March-----					35.6	0	8.41	517	
April-----					25.2	0	3.20	190	
May-----					.04	.01	.016	1.0	
June-----					.5	0	.063	3.7	

\* Interpolated.

NOTE.—No flow during October and July to September.

## MCEACHERN CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

**LOCATION.**—Staff gage in SW¼ 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 1932. March 1924 to October 1926 station above east fork of this stream maintained by Department of the Interior, Canada.

**EXTREMES.**—Maximum discharge during year, 118 second-feet Mar. 26 (gage height, 4.05 feet); no flow at various times.

1927-32: Maximum discharge, 1,850 second-feet Apr. 9, 1927 (gage height, 10.42 feet); no flow at various times.

**REMARKS.**—Records fair. No records Nov. 1 to Feb. 27. Stage-discharge relation affected by ice Mar. 1-31. 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, 1931-32*

Day	Mar.	Apr.	May	June	Aug.	Day	Mar.	Apr.	May	June	Aug.
1.....	3.1	28.2	0.7	0.5	0	16.....	0	0.2	0.04	0.06	0.5
2.....	2.8	61	.7	.3	0	17.....	0	.2	.04	.05	.1
3.....	.4	37.8	.5	.07	0	18.....	0	.2	.04	.04	.1
4.....	.02	11.7	.5	.02	0	19.....	0	.2	.04	.04	0
5.....	0	5.4	.3	.02	0	20.....	0	.4	.03	.04	0
6.....	0	2.9	.2	.02	0	21.....	0	.5	.02	.02	0
7.....	0	2.3	.2	.03	0	22.....	3.1	.7	.02	.02	0
8.....	0	1.5	.2	.1	0	23.....	1.4	.9	.02	.01	0
9.....	0	.8	.2	.1	0	24.....	3.1	1.2	.02	.01	0
10.....	0	.4	.1	.06	0	25.....	95	1.4	.02	0	0
1.....	0	.2	.07	13.8	0	26.....	118	1.3	.01	0	0
2.....	0	.2	.05	3.5	0	27.....	80	1.2	.01	0	0
3.....	0	.2	.05	1.4	0	28.....	53	1.0	.01	0	0
4.....	0	.2	.05	.5	4.3	29.....	32.6	.8	.01	0	0
5.....	0	.2	.05	.2	1.0	30.....	34.3	.8	.01	0	0
						31.....	25.0	-----	.04	-----	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March.....	118	0	14.6	898
April.....	61	.2	5.47	325
May.....	7	.01	.137	8.4
June.....	13.8	0	.697	41
August.....	4.3	0	.196	12

**NOTE.**—No flow during October, July, and September.

## 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 1932.

**EXTREMES.**—Maximum discharge during year, 254 second-feet Mar. 25 (gage height, 4.92 feet); no flow at various times.

1931-32: Maximum discharge, that of Mar. 25, 1932; no flow at various times.

**REMARKS.**—Records good. Discharge interpolated Mar. 30. May 30. Stage-discharge relation affected by ice Mar. 21-25. No records Nov. 1 to Mar. 20. 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, 1931-32*

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	1.0		91	11.2	6.5	0	0	6.8
2.	.9		82	10.0	6.8	0	0	6.8
3.	.7		46.8	9.0	7.4	0	0	6.8
4.	.9		51	8.7	6.2	.3	0	7.1
5.	.9		33.1	8.7	5.0	.8	0	7.1
6.	.7		22.0	9.4	6.8	.3	0	6.8
7.	.7		16.5	9.4	13.6	0	0	6.2
8.	1.0		12.8	9.0	20.8	0	0	5.9
9.	1.0		10.8	8.7	17.5	0	0	5.6
10.	1.0		9.4	8.7	19.6	0	0	3.8
11.	1.4		9.0	8.1	3.2	0	0	3.8
12.	1.4		8.1	8.1	3.2	0	3.3	3.3
13.	1.4		7.8	7.1	2.4	0	43.4	3.3
14.	1.4		7.8	6.5	15.0	0	8.7	2.6
15.	1.7		7.8	5.9	10.0	0	4.1	1.8
16.	1.7		8.1	5.9	7.4	0	2.6	1.8
17.	1.7		7.4	6.2	6.5	0	1.8	1.6
18.	1.7		7.4	5.6	5.6	0	.8	1.3
19.	1.9		7.4	5.0	4.1	0	0	1.0
20.	2.1		7.1	5.0	3.3	0	0	1.0
21.	1.7	251	6.5	4.7	2.8	0	0	1.3
22.	1.9	253	7.8	4.4	1.8	0	0	1.3
23.	1.9	130	9.0	4.1	1.8	0	.5	1.3
24.	2.1	169	9.4	3.6	1.3	0	4.1	1.3
25.	1.9	208	10.8	3.0	1.6	0	4.7	1.3
26.	2.4	247	10.8	3.3	1.3	0	4.7	1.6
27.	2.4	196	10.4	3.3	.8	0	4.1	1.8
28.	2.1	134	10.0	3.0	.8	0	3.6	1.8
29.	3.1	91	12.4	2.8	.8	0	3.6	1.8
30.	1.9	81	12.0	3.3	0	0	4.7	1.8
31.	2.4	71		3.8		0	6.5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3.1	0.7	1.58	97
March 21-31.....	253	71	166	3,620
April.....	91	6.5	18.4	1,090
May.....	11.2	2.8	6.31	388
June.....	35.2	0	9.00	536
July.....	.8	0	.05	3.1
August.....	43.4	0	3.26	200
September.....	7.1	1.0	3.32	198

## 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 Scobey, Mont.

DRAINAGE AREA.—256 square miles.

RECORDS AVAILABLE.—March 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 975 second-feet Aug. 13 (gage height, 10.70 feet); minimum, 0.5 second-foot (estimated) Mar. 12.

1931-32: Maximum discharge, that of Aug. 13, 1932; minimum, that of Mar. 12, 1932.

REMARKS.—Records fair. 'No records Nov. 1 to Mar. 11. Discharge estimated because of ice effect Mar. 12-22. Discharge interpolated Apr. 8-10. 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, 1931-32*

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3.6	-----	51.0	7.1	3.1	3.0	2.7	6.3
2.....	3.7	-----	47.6	7.0	3.2	3.2	2.7	6.1
3.....	3.5	-----	39.5	6.6	3.2	3.2	2.8	6.0
4.....	3.6	-----	41.0	6.6	3.0	3.3	2.9	5.5
5.....	3.7	-----	41.8	6.4	3.0	3.4	2.7	5.4
6.....	3.9	-----	37.0	6.4	3.2	3.4	2.6	5.2
7.....	3.9	-----	26.0	6.4	3.4	3.4	2.6	5.1
8.....	4.0	-----	21.8	6.5	3.8	3.2	2.7	4.9
9.....	4.1	-----	17.7	6.4	4.5	3.1	2.6	4.7
10.....	4.1	-----	13.5	6.3	4.5	2.9	2.5	4.6
11.....	4.0	-----	9.3	6.0	4.7	3.0	2.7	4.7
12.....	4.2	-----	10.2	5.9	4.4	2.9	155	4.6
13.....	4.2	-----	9.6	5.7	4.2	2.9	336	4.4
14.....	4.4	-----	9.2	5.5	3.9	3.1	26.8	4.3
15.....	4.5	-----	8.4	5.1	3.7	2.8	16.6	4.3
16.....	4.3	3.0	8.6	4.9	3.5	2.5	12.8	4.2
17.....	4.4	-----	8.5	4.8	3.2	2.5	11.6	4.2
18.....	4.2	-----	8.4	4.6	2.9	2.5	10.8	4.2
19.....	4.3	-----	8.1	4.4	2.6	2.4	10.3	4.1
20.....	4.3	-----	8.0	4.1	2.4	2.7	9.2	4.1
21.....	4.4	70	7.7	3.8	2.3	2.6	16.0	4.0
22.....	4.4	-----	7.9	4.1	2.1	2.4	18.1	3.8
23.....	4.6	222	8.2	3.9	2.1	2.6	8.1	3.9
24.....	4.5	157	8.1	3.6	2.3	2.6	7.5	3.7
25.....	4.5	90	8.1	3.4	2.4	2.2	7.2	3.6
26.....	4.7	94	8.0	3.3	2.6	2.3	6.8	3.5
27.....	4.9	80	7.5	3.4	2.7	2.4	6.4	3.5
28.....	4.6	69	7.7	3.3	3.0	2.4	6.2	3.5
29.....	4.4	62	7.6	3.0	3.2	2.3	6.2	3.6
30.....	4.4	58	7.2	2.9	3.5	2.4	6.4	3.6
31.....	4.7	51	-----	3.1	-----	2.6	6.6	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	4.9	3.5	4.22	259
March 12-31.....	222	-----	55.8	2,210
April.....	51	7.2	16.8	1,000
May.....	7.1	2.9	4.98	306
June.....	4.7	2.1	3.22	192
July.....	3.4	2.2	2.78	172
August.....	336	2.5	23.0	1,410
September.....	6.3	3.5	4.45	265

## 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 from Opheim, Mont.

**DRAINAGE AREA.**—141 square miles.

**RECORDS AVAILABLE.**—March 1931 to September 1932.

**EXTREMES.**—Maximum discharge during year, 68 second-feet Mar. 24 (gage height, 2.04 feet); no flow at various times.

1931-32: Maximum discharge, that of Mar. 24, 1932; no flow at various times.

**REMARKS.**—Records good except those for period of ice effect, Mar. 11-31, which are fair. Discharge interpolated Mar. 12, 29-30. 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, 1931-32*

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	-----	22.2	1.2	0.2	0	0	0.2
2	.2	-----	20.2	1.2	.3	.1	0	.2
3	.1	-----	12.2	1.1	.3	.1	0	.2
4	.1	-----	10.8	1.0	.2	.1	0	.2
5	.2	-----	7.7	1.0	.3	.2	0	.2
6	.1	-----	8.0	1.0	.4	.3	0	.2
7	.1	-----	3.7	1.2	.5	.3	0	.2
8	.1	-----	2.8	1.1	.7	.3	0	.1
9	.2	-----	1.8	1.1	1.0	.3	0	.2
10	.2	-----	1.4	1.1	1.2	.2	0	.1
11	.1	0.0	.8	1.0	1.8	.2	0	.1
12	.1	.1	.8	.8	2.8	.3	0	.1
13	.1	.2	.8	.7	2.4	.2	0	.1
14	.2	.2	.6	.6	1.8	.2	0	.1
15	.2	.2	.5	.6	1.3	.2	0	.1
16	.2	.2	.5	.5	.8	.1	0	.1
17	.2	.2	.5	.6	.6	.1	0	.1
18	.2	.3	.5	.5	.4	.1	0	.06
19	.2	.2	.5	.5	.4	0	0	.1
20	.2	.2	.5	.4	.3	0	0	.1
21	.2	.2	.5	.4	.3	0	0	.1
22	.2	7.7	.6	.4	.2	0	0	.06
23	.2	33.0	.5	.3	.2	0	0	.1
24	.2	57.0	.6	.2	.2	0	0	.1
25	.2	48.6	.9	.2	.2	0	0	.1
26	.2	44.0	1.0	.2	.2	0	0	.1
27	.1	43.0	.9	.2	.2	0	0	.1
28	.2	36.5	.7	.2	.2	0	0	.1
29	.2	31.5	1.0	.2	.2	0	.1	.06
30	.2	27.0	1.2	.2	.1	0	.2	.06
31	.2	22.6	-----	.2	-----	0	.2	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.2	0.1	0.17	10
March 11-31	57	0	16.8	790
April	22.2	.5	3.49	208
May	1.2	.2	.64	39
June	2.8	.1	.66	89
July	.3	0	.11	6.8
August	.2	0	.02	1.2
September	.2	.06	.12	7.1



## 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 7,729.51 feet above mean sea level.

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—October 1921 to September 1932.

EXTREMES.—Maximum stage during year, 5.0 feet July 3-5; minimum, -0.1 foot Dec. 7, 8.

1921-32: Maximum stage, 6.12 feet June 30, 1927; minimum, that of 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 record Jan. 23 to Apr. 15. No regulation.

*Gage height, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.3	0	0.1	-----	0.5	2.2	*4.94	*3.54	2.1
2	.6	.36	0	.1	-----	.5	2.2	*4.97	*3.46	*1.94
3	*.61	.3	0	.1	-----	.5	2.2	*5.00	*3.40	*1.94
4	.6	.3	0	.1	-----	.5	*2.42	5.0	*3.34	2.0
5	.6	.3	0	.1	-----	.5	2.4	5.0	*3.28	1.9
6	.6	.3	0	.1	-----	.5	2.4	*4.90	*3.22	*1.9
7	.6	*.32	-.1	.1	-----	.5	2.5	*4.80	*3.14	1.9
8	.5	.3	-.1	.1	-----	.5	2.6	*4.76	*3.08	1.8
9	.5	.3	0	.1	-----	.6	2.7	*4.70	*3.02	1.8
10	*.54	.3	0	.1	-----	.6	*2.78	*4.62	*2.98	*1.68
11	.5	.2	0	.1	-----	.6	*2.87	*4.58	*2.94	1.7
12	.5	.2	0	.2	-----	.7	2.9	*4.60	*2.90	1.7
13	.5	.2	0	.2	-----	.8	*2.98	4.6	*2.84	1.7
14	.4	*.20	0	.2	-----	.9	3.0	*4.60	*2.78	1.6
15	.4	.2	0	.2	-----	1.1	*3.12	*4.56	*2.74	1.6
16	.4	.2	0	.2	0.4	1.2	*3.38	*4.48	*2.70	1.6
17	.4	.2	0	.2	.4	1.2	*3.44	*4.42	*2.64	1.6
18	.4	.2	0	.2	.4	1.3	3.5	*4.36	*2.60	1.5
19	.4	.2	0	.2	.4	1.3	*3.72	4.3	*2.54	1.5
20	.4	.1	0	.2	.4	1.4	*3.82	*4.18	*2.50	1.5
21	.4	*.18	0	.2	.4	1.5	3.8	*4.12	*2.46	1.4
22	.4	.1	0	.2	.4	1.7	3.9	*4.08	*2.42	1.4
23	.4	.1	0	-----	.4	1.8	*4.08	*4.04	*2.37	*1.30
24	.4	.1	0	-----	.4	1.9	4.2	*4.00	*2.32	*1.28
25	.4	.1	0	-----	.5	1.9	4.4	*3.98	*2.26	1.3
26	.4	.1	.1	-----	.5	2.0	*4.50	*3.96	*2.22	1.3
27	.4	.1	.1	-----	.5	2.0	*4.72	*3.88	*2.17	1.3
28	.4	*.12	.1	-----	.5	*2.14	4.8	*3.80	2.2	1.3
29	.4	.0	.1	-----	.5	1.9	*4.82	*3.72	2.2	1.3
30	.4	.0	.1	-----	.5	1.8	*4.92	*3.66	2.2	1.2
31	*.37	-----	.1	-----	-----	1.9	-----	*3.60	2.1	-----

\* Actual gage observations; others estimated.

## 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. Elevation of zero of gage at recorder site is 7,727.84 feet, and of staff gage at Fishing Bridge is 7,728.90 feet above mean sea level.

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—December 1922 to September 1932. Gage-height records only prior to October 1926.

EXTREMES.—Maximum discharge during year, 5,570 second-feet July 3 (gage height, 6.24 feet); minimum, 220 second-feet Dec. 7 (gage height, 1.45 feet).

1922-32: Maximum discharge, 7,420 second-feet June 29, 30, July 1, 1927 (gage height, 6.3 feet at staff gage on Fishing Bridge or 7.1 at recorder); minimum, that of Dec. 7, 1931.

REMARKS.—Records good except those for Oct. 1 to Apr. 15, which are fair. Discharge estimated Dec. 21 to Apr. 15 on account of ice. No artificial regulation.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	475	412	302	300	300	320	400	462	1,740	5,570	3,160	1,380
2.....	466	408	302					466	1,800	5,570	3,080	1,340
3.....	475	403	294					470	1,800	5,570	3,020	1,300
4.....	462	398	298					485	1,800	5,570	2,950	1,270
5.....	462	394	294					485	1,920	5,570	2,820	1,250
6.....	457	394	294	300	300	320	400	485	1,980	5,390	2,750	1,240
7.....	452	385	270					485	2,110	5,390	2,680	1,220
8.....	448	398	270					490	2,170	5,210	2,620	1,180
9.....	444	390	288					505	2,240	5,210	2,560	1,140
10.....	430	385	288					525	2,300	5,030	2,500	1,120
11.....	430	377	291	300	300	320	400	542	2,360	5,030	2,420	1,100
12.....	426	377	294					574	2,420	5,030	2,360	1,080
13.....	426	369	302					616	2,490	4,860	2,300	1,070
14.....	421	365	302					692	2,620	4,860	2,240	1,030
15.....	421	373	302					770	2,750	4,860	2,170	1,010
16.....	416	369	305	300	300	320	400	448	812	2,950	4,690	2,110
17.....	416	365	309					448	855	3,160	4,520	2,050
18.....	408	357	309					448	885	3,300	4,520	1,980
19.....	412	357	313					448	940	3,440	4,520	1,920
20.....	412	341	305					448	1,000	3,590	4,360	1,920
21.....	412	341	300	300	320	350	450	448	1,090	3,590	4,200	1,860
22.....	421	333						452	1,240	3,740	4,200	1,800
23.....	444	329						457	1,340	3,890	4,040	1,740
24.....	439	329						457	1,380	4,200	3,890	1,690
25.....	444	325						462	1,460	4,520	3,890	1,630
26.....	444	317	300	300	320	350	450	462	1,520	4,690	3,740	1,600
27.....	444	313						466	1,490	5,030	3,590	1,550
28.....	434	317						466	1,380	5,210	3,520	1,500
29.....	426	313						466	1,440	5,390	3,370	1,480
30.....	421	309						466	1,340	5,390	3,300	1,450
31.....	416							1,470		3,230	1,420	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	475	408	436	0.432	0.50	26,800
November.....	412	309	361	.357	.40	21,500
December.....		270	298	.275	.34	18,300
January.....			300	.277	.34	18,400
February.....			306	.303	.33	17,600
March.....			335	.352	.38	20,600
April.....	466		428	.424	.47	25,500
May.....	1,530	462	803	.684	1.02	54,900
June.....	5,390	1,740	3,150	3.15	3.48	187,000
July.....	5,570	3,230	4,590	4.54	5.23	282,000
August.....	3,160	1,420	2,170	2.15	2.48	133,000
September.....	1,380	833	1,050	1.04	1.16	62,500
The year.....	5,570	270	1,200	1.10	16.13	868,000

## 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 1932 (except winters).

EXTREMES.—Maximum discharge during year, 5,680 second-feet July 3 (gage height, 3.55 feet); minimum occurred during winter.

1913-32: 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 except those for October, which are fair. Discharge estimated Oct. 1-31, May 29 to June 3; interpolated Aug. 12. No artificial regulation or diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	May	June	July	Aug.	Sept.
1	480		2,000	5,550	3,230	1,460
2			2,000	5,550	3,170	1,400
3			2,000	5,680	3,100	1,340
4			2,120	5,550	3,000	1,320
5			2,180	5,550	2,940	1,320
6			2,280	5,420	2,870	1,300
7			2,320	5,290	2,830	1,290
8			2,580	5,290	2,770	1,290
9			2,600	5,160	2,700	1,240
10			2,600	5,040	2,640	1,200
11	450		2,680	5,040	2,600	1,180
12			2,790	5,040	2,490	1,180
13			2,770	5,040	2,380	1,160
14			2,830	5,040	2,340	1,140
15			2,940	4,920	2,300	1,120
16			3,210	4,800	2,200	1,120
17			3,340	4,680	2,120	1,100
18		1,260	3,440	4,560	2,080	1,100
19		1,380	3,550	4,500	2,000	1,050
20		1,420	3,660	4,440	1,950	1,030
21	460	1,540	3,700	4,330	1,940	1,030
22		1,670	3,880	4,220	1,860	993
23		1,610	4,100	4,100	1,810	984
24		1,580	4,220	4,100	1,700	993
25		1,670	4,440	3,990	1,720	984
26		1,750	4,800	3,880	1,660	958
27		1,730	5,040	3,770	1,630	950
28		1,730	5,290	3,660	1,600	950
29		1,650	5,420	3,550	1,600	941
30		1,550	5,550	3,440	1,550	932
31		1,700		3,340	1,510	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October			463	0.399	0.46	28,500
May 18-31	1,750	1,260	1,590	1.37	.71	44,200
June	5,550		3,350	2.89	3.22	199,000
July	5,680	3,340	4,660	4.02	4.64	287,000
August	3,230	1,510	2,270	1.96	2.26	140,000
September	1,460	932	1,140	.983	1.10	67,800

## YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT.

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

DRAINAGE AREA.—2,630 square miles.

RECORDS AVAILABLE.—September 1910 to September 1932.

EXTREMES.—Maximum discharge, 15,800 second-feet June 25 (gage height, 7.70 feet); minimum, 585 second-feet Feb. 14–18 (gage height, 0.42 foot).

1910–32: Maximum discharge, 26,500 second-feet June 14, 15, 1918 (gage height, 11.5 feet); minimum, that of Feb. 14–18, 1932.

REMARKS.—Records good except those for estimated periods of ice effect, Dec. 29–30, Jan. 1, 2, 16, 18, Feb. 1–6, Mar. 2–13. Discharge interpolated Dec. 16, 17. Natural storage in Yellowstone Lake.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,000	875	815	638	665	710	875	1,000	6,040	11,800	4,220	2,060
2.....	1,000	875	760	652			935	1,070	6,200	11,500	4,030	2,060
3.....	1,000	875	760	665			875	1,220	6,200	10,800	4,030	2,060
4.....	1,000	875	760	665			875	1,500	8,100	10,200	3,850	2,060
5.....	1,000	875	760	665			875	1,810	9,600	9,340	3,680	1,930
6.....	1,000	875	760	665	680		875	1,700	9,050	9,050	3,510	1,930
7.....	1,000	875	710	665			875	1,700	9,050	8,470	3,510	1,930
8.....	935	875	665	665			875	2,320	8,470	8,470	3,510	1,810
9.....	935	875	625	665			875	2,600	8,470	8,180	3,350	1,810
10.....	935	875	625	665			875	3,510	8,180	7,900	3,350	1,700
11.....	935	875	625	665	625		875	4,420	8,470	7,620	3,350	1,700
12.....	935	875	625	665	625		875	5,800	9,050	8,470	3,190	1,700
13.....	935	875	625	625	625		875	7,350	9,600	7,900	3,030	1,600
14.....	935	875	625	625	585	710	935	9,340	11,200	9,050	3,030	1,600
15.....	935	875	625	625	585	710	1,070	5,800	12,400	7,350	2,880	1,600
16.....	875	875	638	625	585	760	1,070	5,800	13,800	7,080	2,740	1,600
17.....	875	875	652	625	585	760	1,070	5,800	13,800	6,810	2,740	1,500
18.....	875	875	665	625	585	760	1,220	7,900	12,100	6,550	2,740	1,500
19.....	875	815	665	665	625	815	1,310	8,470	12,800	6,290	2,600	1,500
20.....	875	815	665	665	710	815	1,220	9,930	11,500	6,290	2,600	1,500
21.....	875	815	665	665	665	815	1,220	11,500	12,400	6,040	2,600	1,500
22.....	935		665	665	625	815	1,140	14,400	13,800	5,560	2,600	1,500
23.....	935		665	625	625	815	1,070	9,340	15,100	5,320	2,460	1,500
24.....	935		665	625	625	815	1,070	7,350	15,500	5,320	2,320	1,500
25.....	935		665	665	665	815	1,070	6,290	15,800	5,320	2,320	1,500
26.....	935	815	665	625	665	760	1,070	5,800	15,500	4,850	2,320	1,400
27.....	935	815	665	625	665	815	1,000	5,320	15,100	4,850	2,190	1,400
28.....	935	815	665	625	665	815	1,000	5,320	13,100	4,850	2,190	1,310
29.....	935	815	652	625	710	875	1,000	6,040	12,800	4,630	2,190	1,310
30.....	875	815	630	625	-----	815	1,000	6,810	12,800	4,420	2,190	1,310
31.....	875	-----	625	625	-----	815	-----	6,290	-----	4,420	2,320	-----

Month	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October.....	1,000	875	934	0.355	0.41	57,400
November.....	875	815	851	.32	.36	50,600
December.....	815	625	673	.255	.30	41,400
January.....	665	646	646	.243	.28	39,700
February.....	710	585	641	.244	.26	36,900
March.....	875	-----	747	.28	.33	45,900
April.....	1,310	875	999	.380	.42	59,400
May.....	14,400	1,000	5,600	2.13	2.46	344,000
June.....	15,800	6,040	11,200	4.26	4.75	666,000
July.....	11,800	4,420	7,260	2.76	3.18	446,000
August.....	4,220	2,190	2,960	1.13	1.30	182,000
September.....	2,060	1,310	1,650	.627	.70	98,200
The year.....	15,800	585	2,850	1.08	14.75	2,070,000

## YELLOWSTONE RIVER NEAR LIVINGSTON, MONT.

LOCATION.—Chain gage in NW¼ sec. 12, T. 3 S., R. 9 E., at highway bridge on Yellowstone Trail 5 miles south of Livingston.

DRAINAGE AREA.—3,580 square miles.

RECORDS AVAILABLE.—May 1897 to December 1905; August 1928 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 20,800 second-feet June 25 (gage height, 7.76 feet); minimum, 660 second-feet Jan. 6 (gage height, 0.72 foot).

1897-1905, 1928-32: Maximum discharge, 26,800 second-feet June 1, 1897; minimum, that of Jan. 6, 1932.

REMARKS.—Records good except those computed for ice period, Jan. 1 to Feb. 25, which are fair. Discharge estimated because of ice Nov. 22-24, Dec. 8, 9. Some diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,330	1,190	1,010	795	738	1,050	1,100	1,330	6,280	14,200	4,570	2,480
2.....	1,330	1,190	1,050	795	710	1,010	1,140	1,330	6,560	13,300	4,570	2,480
3.....	1,330	1,190	1,050	738	710	965	1,190	1,430	6,560	12,500	4,370	2,480
4.....	1,330	1,190	1,050	765	738	965	1,190	1,530	8,430	11,700	4,160	2,320
5.....	1,330	1,240	1,100	738	765	890	1,140	1,880	10,900	10,500	4,160	2,320
6.....	1,330	1,190	1,050	660	795	858	1,100	1,880	10,500	10,200	3,930	2,160
7.....	1,330	1,190	1,010	765	825	795	1,100	2,010	10,200	9,790	3,730	2,160
8.....	1,330	1,190	1,010	825	890	825	1,100	2,010	10,200	9,100	3,700	2,160
9.....	1,240	1,240	1,010	795	858	825	1,100	2,480	9,790	8,760	3,530	2,160
10.....	1,240	1,190	1,010	795	858	858	1,050	3,180	9,440	8,430	3,530	2,010
11.....	1,240	1,190	890	765	858	858	1,050	4,580	9,790	8,430	3,370	2,010
12.....	1,240	1,050	928	765	890	858	1,100	6,280	10,900	8,430	3,370	2,010
13.....	1,240	1,010	890	765	825	928	1,140	7,460	11,300	8,100	3,370	2,010
14.....	1,240	1,100	825	765	825	1,010	1,330	10,500	13,800	9,440	3,180	1,880
15.....	1,240	1,140	795	765	795	1,050	1,330	10,500	16,400	8,100	3,180	1,880
16.....	1,240	1,140	928	738	795	1,100	1,330	6,280	18,200	7,150	3,180	1,880
17.....	1,240	1,140	890	710	765	1,140	1,330	6,010	17,700	7,150	3,000	1,880
18.....	1,240	1,140	928	765	765	1,190	1,530	8,430	15,900	6,850	3,000	1,880
19.....	1,190	1,100	1,010	738	765	1,190	1,530	9,440	16,800	6,560	3,000	1,880
20.....	1,190	1,050	1,010	738	765	1,240	1,530	11,700	15,500	6,280	2,820	1,760
21.....	1,190	890	1,010	765	825	1,190	1,530	13,800	15,500	6,280	2,820	1,760
22.....	1,190	890	1,010	738	858	1,050	1,430	18,200	17,700	5,750	2,820	1,880
23.....	1,190	890	1,010	795	858	1,100	1,330	13,800	20,400	5,500	2,650	1,760
24.....	1,240	890	965	765	858	1,050	1,430	9,100	19,500	5,500	2,650	1,760
25.....	1,240	1,050	1,010	765	890	1,050	1,430	7,150	20,400	5,260	2,650	1,760
26.....	1,240	1,050	1,050	765	965	1,050	1,330	6,560	19,500	5,260	2,650	1,760
27.....	1,330	1,100	1,010	795	1,010	1,050	1,330	6,010	19,000	5,260	2,480	1,760
28.....	1,240	1,050	1,010	795	1,010	1,050	1,430	5,500	15,000	5,030	2,480	1,760
29.....	1,190	1,050	1,010	825	928	1,100	1,330	6,010	14,600	5,030	2,650	1,760
30.....	1,190	1,050	965	795	-----	1,100	1,330	6,850	15,000	4,800	2,650	1,760
31.....	1,190	-----	795	825	-----	1,100	-----	6,850	-----	4,800	2,480	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,330	1,190	1,250	76,900
November.....	1,240	890	1,100	65,500
December.....	1,100	795	977	60,100
January.....	825	660	768	47,200
February.....	1,010	710	832	47,900
March.....	1,240	795	1,020	62,700
April.....	1,530	1,050	1,280	76,200
May.....	18,200	1,330	6,450	397,000
June.....	20,400	6,280	13,700	815,000
July.....	14,200	4,800	7,850	483,000
August.....	4,580	2,480	3,250	200,000
September.....	2,480	1,760	1,980	118,000
The year.....	20,400	660	3,380	2,450,000

## YELLOWSTONE RIVER AT BILLINGS, MONT.

LOCATION.—Water-stage recorder in NE¼ sec. 2, T. 1 S., R. 26 E., at Billings. Chain gage on highway bridge about 1 mile below used prior to July 1, 1932.

RECORDS AVAILABLE.—May 1904 to December 1905; August 1928 to September 1932.

EXTREMES.—Maximum discharge for year, 37,400 second-feet June 26 (gage height, 10.10 feet); minimum probably occurred during ice period in February.

1904-5, 1928-32; Maximum discharge, that of June 26, 1932; minimum, 1,600 second-feet Jan. 8, 1930.

REMARKS.—Records good except those estimated for period of ice effect, Nov. 19 to Mar. 21, which are fair. Numerous diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3,860	2,580	2,250	1,900	1,680	2,710	2,720	3,180	12,100	27,200	6,310	3,860
2.....	3,680	2,580					2,870	3,180	11,400	24,200	5,880	3,660
3.....	3,340	2,580					2,720	3,340	11,000	24,200	5,610	3,660
4.....	3,340	2,580					2,720	3,860	11,000	22,200	5,220	3,660
5.....	3,340	2,580					2,580	3,860	13,300	19,700	4,860	3,660
6.....	3,510	2,580	2,580	1,820	1,380	4,780	2,440	5,150	20,200	16,800	4,740	3,480
7.....	3,510	2,580	2,440				2,300	5,910	21,100	15,200	4,740	3,220
8.....	3,510	2,580	2,440				2,160	5,400	30,000	14,700	4,620	3,140
9.....	3,340	2,580	2,440				2,160	5,150	30,500	14,200	4,390	3,050
10.....	3,180	2,580	2,300				2,300	5,650	21,600	13,700	4,170	3,480
11.....	3,180	2,580	2,160	1,820	1,380	4,780	2,160	7,030	20,700	13,200	4,170	3,660
12.....	3,180	2,580	2,160				2,030	8,570	21,600	13,700	4,170	3,300
13.....	3,020	2,440	2,030				2,160	10,600	22,000	14,700	4,060	2,970
14.....	3,020	2,300	1,960				2,300	14,500	22,400	14,700	4,060	2,970
15.....	3,020	2,300	1,900				2,580	19,400	25,700	14,700	3,860	2,970
16.....	2,870	2,300	1,780	1,880	1,620	2,440	2,720	18,100	31,400	13,200	3,780	3,140
17.....	2,870	2,160	1,900				2,720	16,100	32,900	13,200	3,660	3,050
18.....	2,720	2,030	2,030				2,720	13,700	31,400	11,400	3,660	3,140
19.....	2,870	2,000	2,030				3,020	14,500	28,000	11,800	3,570	3,050
20.....	2,870		2,030				3,020	16,100	27,600	11,400	3,480	3,140
21.....	2,870		2,030				3,020	20,200	26,600	9,290	3,570	3,300
22.....	2,870		2,160				4,460	25,700	28,500	9,500	3,570	3,220
23.....	2,720		2,580				4,910	3,180	28,000	31,000	8,890	3,220
24.....	2,720		2,580				2,870	3,180	19,800	34,400	8,330	3,300
25.....	2,720		2,580				2,440	3,020	16,100	35,900	8,150	3,220
26.....	2,720	2,000	2,300	1,880	1,620	2,300	2,870	13,700	36,900	7,620	3,220	3,220
27.....	2,720		2,440				2,300	2,720	12,500	33,900	7,110	3,140
28.....	2,720		2,300				2,160	2,720	11,400	31,000	6,780	3,390
29.....	2,720		2,030				2,160	3,180	11,000	26,600	6,620	3,390
30.....	2,580		2,160				2,160	3,020	10,200	24,700	6,620	3,140
31.....	2,720	-----	2,030	-----	-----	2,160	-----	12,100	-----	6,620	3,760	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3,860	2,580	3,040	187,000
November.....	2,580	-----	2,280	136,000
December.....	2,580	1,780	2,210	136,000
January.....	-----	-----	1,870	115,000
February.....	-----	-----	1,660	89,700
March.....	4,910	2,160	3,470	213,000
April.....	3,180	2,030	2,680	159,000
May.....	28,000	3,180	11,700	719,000
June.....	36,900	11,000	25,200	1,500,000
July.....	27,200	6,620	13,200	812,000
August.....	6,310	3,140	4,090	251,000
September.....	3,860	2,970	3,280	195,000
The year.....	36,900	-----	6,220	4,510,000

## YELLOWSTONE RIVER AT MILES CITY, MONT.

**LOCATION.**—Water-stage recorder at highway bridge just below mouth of Tongue River at Miles City. Prior to Oct. 1, 1931, wire gage at same location was used.

**RECORDS AVAILABLE.**—September 1922 to August 1923; August 1928 to September 1932.

**EXTREMES.**—Maximum discharge, 65,200 second-feet June 28 (gage height, 12.17 feet); minimum (estimated), 1,700 second-feet Nov. 23.

1922-23, 1928-32: Maximum discharge, that of June 28, 1932; minimum, that of Nov. 23, 1932.

**REMARKS.**—Records good except those estimated for period of ice effect, Nov. 18 to Mar. 23, which are fair. Numerous diversions from stream and tributaries above gage. Some storage on tributary streams.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,630	4,980					5,870	6,900	20,600	51,800	8,860	5,870
2	5,630	4,980					5,630	6,900	19,400	49,500	8,160	6,620
3	5,410	4,780					5,630	7,200	20,000	45,800	8,160	6,110
4	5,190	4,780					5,630	6,900	19,400	45,000	7,500	6,110
5	5,190	4,780					5,870	8,860	18,300	42,000	6,900	6,900
6	4,980	4,780	3,440	3,550	2,030	5,420	6,110	10,400	17,700	38,300	6,620	6,900
7	4,780	4,780					6,110	9,600	25,000	33,300	6,360	6,900
8	4,980	4,780					5,870	17,100	38,300	28,400	5,870	6,360
9	5,630	4,780					5,630	17,700	45,000	25,000	5,870	5,870
10	5,870	4,680					5,410	12,600	62,200	23,000	5,630	5,630
11	5,630	4,680					4,980	11,200	44,300	21,200	5,410	5,870
12	5,410	4,680					4,980	11,700	38,300	20,000	5,190	5,410
13	5,190	4,680					4,780	14,000	39,100	19,400	5,630	6,620
14	5,190	4,680					4,590	19,400	38,300	19,400	6,110	6,900
15	5,410	4,590					4,500	28,700	37,600	20,600	6,110	6,110
16	5,190	4,500	2,940	3,360	1,970	4,020	4,590	34,000	41,300	21,800	6,360	5,870
17	5,190	4,500					4,680	37,600	48,800	21,200	5,190	5,630
18	4,980						4,780	32,600	54,000	19,400	4,980	5,870
19	4,980						4,980	27,700	53,200	17,700	4,780	5,870
20	4,780						4,980	29,100	51,800	18,300	4,780	5,870
21	4,780						5,190	31,200	50,200	18,800	4,680	5,870
22	4,680					9,520	5,630	39,800	47,200	16,000	4,680	6,110
23	4,680						6,110	44,300	45,800	14,000	4,780	6,360
24	4,680	2,990				11,200	13,100	51,000	48,000	13,100	4,680	6,620
25	4,680					10,000	17,100	49,500	54,000	12,100	4,590	6,620
26	4,780		3,520	2,910	3,110	8,860	10,800	37,600	57,000	11,700	4,680	6,110
27	4,780					8,160	10,000	32,600	62,200	10,800	4,590	5,190
28	4,980					6,900	7,820	27,000	65,200	9,600	4,500	5,190
29	4,980					5,870	6,900	23,000	59,200	8,860	4,980	5,410
30	4,780					5,410	7,200	20,600	56,200	8,500	5,410	5,410
31	5,190					5,410		19,400		8,160	5,870	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,870	4,680	5,100	314,000
November	4,980		3,980	237,000
December			3,310	204,000
January			3,260	200,000
February			2,340	135,000
March	11,200		5,960	366,000
April	17,100	4,500	6,520	388,000
May	51,000	6,900	23,300	1,430,000
June	65,200	17,700	42,600	2,530,000
July	51,800	8,160	23,000	1,410,000
August	8,860	4,500	5,740	353,000
September	6,900	5,190	6,070	361,000
The period	65,200		10,900	7,930,000

## YELLOWSTONE RIVER AT GLENDIVE, MONT.

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

**DRAINAGE AREA.**—66,800 square miles.

**RECORDS AVAILABLE.**—August 1903 to December 1910; October 1931 to September 1932. January 1911 to September 1931 at Lower Yellowstone Dam at Intake, 18 miles downstream.

**EXTREMES.**—Maximum discharge during year, 65,100 second-feet June 29 (gage height, 11.50 feet); minimum probably occurred during winter.

1903-32: Maximum discharge, 159,000 second-feet June 21, 1921 (gage height, 12.6 feet at Intake); minimum, 1,200 second-feet Dec. 6-8, 1922, Jan. 6-7, 1923 (gage height, 0.20 foot at Intake).

**REMARKS.**—Records good except those estimated for period of ice effect, Nov. 18 to Mar. 31, which are fair. Records for Oct. 1-13 from discontinued station at Intake, Mont. Numerous diversions above station. Some storage on tributaries.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,520	5,650					7,730	10,400	21,200	50,700	9,230	7,360
2	6,040	5,330					7,360	9,610	25,800	48,900	9,610	7,000
3	6,310	5,330					6,650	9,230	24,400	46,200	8,850	8,100
4	6,310	5,020					6,650	9,610	22,400	43,500	8,470	7,360
5	5,780	5,020					7,000	10,800	20,600	42,700	8,100	7,000
6	5,780	5,020					7,360	15,300	21,200	39,300	7,000	8,470
7	5,520	5,020					7,360	13,200	21,800	35,900	6,650	8,470
8	5,260	5,020					7,000	12,000	49,800	31,100	6,310	8,100
9	5,260	5,330					7,000	19,400	48,900	27,200	5,650	7,360
10	5,520	5,020					6,310	21,200	57,300	25,100	5,980	7,000
11	6,040	5,020					5,980	16,800	61,200	23,100	5,330	6,650
12	6,040	5,020					5,650	14,400	42,700	22,400	5,330	7,000
13	5,780	5,020					5,650	14,400	40,100	21,200	8,470	6,310
14	5,650	5,020					5,330	17,300	38,400	21,800	6,650	8,100
15	5,650	5,020					5,330	23,700	37,600	21,800	6,310	8,100
16	5,650	4,720					5,330	31,100	36,800	21,800	6,650	7,000
17	5,650	4,720					5,330	39,300	43,500	23,100	8,850	6,650
18	5,650						5,650	39,300	48,000	20,600	5,650	6,650
19	5,650						5,650	31,800	51,600	19,400	5,330	6,650
20	5,330						5,980	28,000	49,800	23,100	5,020	7,000
21	5,330						5,980	31,100	47,100	21,200	5,020	7,000
22	5,020						8,470	34,300	45,300	17,800	5,020	7,000
23	5,020						15,800	43,500	43,500	16,300	9,610	7,360
24	5,020						10,800	46,200	45,300	14,400	6,650	7,730
25	5,020						27,200	51,600	52,500	14,000	5,020	8,100
26	5,020						21,200	45,300	53,500	13,600	5,020	8,100
27	5,020						14,800	35,900	56,300	12,800	5,020	6,650
28	5,020						13,200	30,300	63,100	12,000	4,720	6,310
29	5,650						10,800	25,800	63,100	10,800	5,020	6,310
30	5,330						10,800	22,400	56,300	9,610	6,310	6,650
31	5,330							21,200		9,230	7,000	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6,310	5,020	5,520	339,000
November	5,650		4,250	263,000
December			2,920	180,000
January			3,270	201,000
February			3,400	196,000
March			6,870	422,000
April	27,200	5,330	8,840	526,000
May	51,600	9,230	25,000	1,540,000
June	63,100	20,600	43,000	2,560,000
July	50,700	9,230	24,500	1,510,000
August	9,610	4,720	6,580	405,000
September	8,470	6,310	7,250	431,000
The year	63,100		11,800	8,560,000



## 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 Sept. 26, 1931, a new staff gage was installed 50 feet below original location and was used continuously thereafter; datum relation not determined.

DRAINAGE AREA.—51 square miles.

RECORDS AVAILABLE.—September 1922 to September 1932.

EXTREMES.—Maximum discharge during year (estimated), 275 second-feet June 16, 17, 23; minimum, 16 second-feet Jan. 23 to Feb. 29 (gage height, 0.96 foot Jan. 23 and 0.98 foot Feb. 6; other dates estimated).

1922-32: 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 November to May, which are poor. Gage read daily during July, August, and early September and at other times less frequently; discharge estimated for days of no gage-height record. No diversions or regulation.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	20	22	19	18	16			30	99	•141	•41	•29
2-----	20	22							106	•141	•40	•29
3-----	•20	21							113	•114	•40	•29
4-----	20	21							•120	•114	•40	•29
5-----	20	•21	•19							•96	•41	•29
6-----	20	20			•16		20			•91	•40	•26
7-----	20	19							160	•81	•36	•26
8-----	20							40		•76	•37	•26
9-----	20		19	•18						•72	•37	•27
10-----	•20									72	•39	•27
11-----	20							•52	•141	72	•39	•27
12-----	20		•19						•156	•72	•37	
13-----	20									•81	•36	
14-----	20								215	•72	•35	
15-----	20							100		•68	•36	26
16-----	20		18	17		18			275	•63	•36	
17-----	20				16				275	•59	36	•26
18-----	21								•237	•59	•35	•26
19-----	21	19	•18						237	•55	•34	
20-----	21								•237	•55	•34	
21-----	21						30		•156	•203	•55	33
22-----	21		18							•255	•52	•33
23-----	21			•16						275	•52	32
24-----	•21									•255	•48	32
25-----	21							115	•255	•48	31	•28
26-----	21		•18							232	•48	•30
27-----	21			16						210	•44	•30
28-----	22							•72	187	•48	•30	27
29-----	22		18					79	•164	•41	30	
30-----	22							86	152	•41	29	
31-----	•22							93		•41	•29	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-foot
October-----	22	20	20.6	0.404	0.47	1,270
November-----			19.4	.380	.42	1,150
December-----			18.4	.361	.42	1,130
January-----			17.0	.333	.38	1,060
February-----			16.0	.314	.34	920
March-----			18.0	.353	.41	1,110
April-----			26.7	.524	.58	1,590
May-----			79.9	1.57	1.81	4,910
June-----	275	99	193	3.78	4.22	11,500
July-----	141	41	70.1	1.37	1.58	4,310
August-----	41	29	35.1	.688	.79	2,160
September-----			27.1	.531	.59	1,610
The year-----	275		45.0	.882	12.01	32,700

• Discharge based on staff-gage reading; estimated or interpolated other dates.

## 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.—640 square miles.

RECORDS AVAILABLE.—September 1922 to September 1932.

EXTREMES.—Maximum discharge during year, 8,420 second-feet May 22, June 25 (gage height, 7.6 feet); minimum, 117 second-feet Nov. 21 (gage height, 0.97 foot).

1922-32: Maximum discharge, 13,600 second-feet May 25, 1928 (gage height, 9.75 feet); minimum, 104 second-feet Apr. 20, 1924 (gage height, 0.92 foot, present datum).

REMARKS.—Records good except those estimated, Nov. 21 to Apr. 23, which are poor. Discharge interpolated Apr. 25-29, May 1-7, 9, Aug. 27. No regulation or diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	193	162						286	2,160	3,560	440	221
2.....	181	162						352	2,100	3,330	417	212
3.....	174	174						418	2,220	2,840	389	230
4.....	169	171						483	3,330	2,450	363	215
5.....	166	166						549	3,790	1,940	346	199
6.....	186	164					150	615	3,710	1,790	330	191
7.....	199	164						680	3,560	1,690	318	191
8.....	183	164						746	3,110	1,640	307	183
9.....	183	164						1,140	2,970	1,500	296	176
10.....	181	144						1,540	2,840	1,400	292	178
11.....	166	164						2,050	3,180	1,450	330	176
12.....	155	199						2,700	3,260	1,790	296	171
13.....	153	199					200	3,330	3,870	1,500	275	169
14.....	151	196						4,290	5,030	1,790	255	169
15.....	149	183			130			3,400	6,240	1,270	245	166
16.....	144	186	140	140		140		2,270	6,450	1,140	245	162
17.....	144	162						2,390	5,820	1,030	242	160
18.....	142	166						3,260	5,220	964	236	157
19.....	142	146						4,040	5,030	964	233	157
20.....	142	160					275	4,840	4,560	870	233	157
21.....	142							6,030	5,220	766	242	186
22.....	146							6,660	6,240	714	230	186
23.....	160							3,870	6,870	682	212	171
24.....	157						258	2,900	6,660	645	207	181
25.....	151						252	2,450	7,090	620	204	183
26.....	176	150					246	2,050	5,820	567	199	183
27.....	157						240	1,790	5,820	534	210	181
28.....	149						234	1,640	4,740	562	221	169
29.....	155						228	2,160	4,380	562	233	164
30.....	140						221	2,700	4,040	501	300	160
31.....	149							2,390		476	245	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	199	140	161	0.252	0.29	9,900
November.....	199		163	.255	.28	9,700
December.....			140	.219	.25	8,610
January.....			140	.219	.25	8,610
February.....			130	.203	.22	7,480
March.....			140	.219	.25	8,610
April.....			213	.333	.37	12,700
May.....	6,660	286	2,390	3.73	4.30	147,000
June.....	7,090	2,100	4,610	7.05	7.87	268,000
July.....	3,560	476	1,340	2.09	2.41	82,400
August.....	440	199	277	.433	.50	17,000
September.....	230	157	180	.281	.31	10,700
The year.....	7,090		814	1.27	17.30	591,000

## 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 Spring, and 0.9 mile east of Mammoth Hotel.

DRAINAGE AREA.—201 square miles.

RECORDS AVAILABLE.—September 1922 to September 1932.

EXTREMES.—Maximum discharge during year, 955 second-feet June 16 (gauge height 2.70 feet); minimum, 45 second-feet Apr. 11 (gauge height 0.60 foot).

1922-32: Maximum discharge, 1,790 second-feet May 28, 1928 (gauge height, 3.59 feet); minimum discharge, 31 second-feet Apr. 7, 1928; minimum gauge height, 0.51 foot Apr. 3, 1931.

REMARKS.—Records excellent except those estimated, Dec. 11 to Jan. 14, Jan. 23-25, 30, 31, Feb. 3-5, 14-19, Mar. 4, 7-13, which are fair. Discharge interpolated Nov. 14-16. No regulation or diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	74	70	67		58	57	61	76	388	502	144	104
2.....	73	71	68		56	57	64	86	406	486	142	102
3.....	71	70	65			57	63	98	411	450	139	104
4.....	70	70	64		60	60	58	122	475	406	131	100
5.....	71	68	64			61	58	136	571	357	131	94
6.....	81	68	65		57	58	60	144	595	327	129	94
7.....	80	67	64		57	58	58	153	565	310	126	92
8.....	76	71	63		57	58	58	186	628	298	117	90
9.....	74	67	63		57	57	57	234	559	278	117	90
10.....	71	68	63	60	56	60	60	282	490	278	124	90
11.....	71	64			55		61	335	491	331	117	90
12.....	71	68			60		67	365	530	331	115	86
13.....	70	54			60		73	421	571	302	113	86
14.....	70	60				63	76	559	640	339	110	86
15.....	70	62				61	74	450	751	278	108	88
16.....	70	64			60	57	76	388	899	248	106	88
17.....	68	67				57	85	421	838	230	108	88
18.....	70	65				57	85	491	786	227	106	88
19.....	70	68		64		58	76	535	751	223	106	88
20.....	70	76		63	61	58	80	608	681	209	104	90
21.....	70	83	60	58	61	56	78	709	695	199	104	92
22.....	71	71		60	61	55	73	808	758	189	100	88
23.....	81	73			63	55	71	628	808	189	100	94
24.....	76	70		60	63	53	70	508	808	192	98	102
25.....	73	70			63	53	71	475	786	180	100	96
26.....	83	68		58	63	55	73	416	737	174	98	96
27.....	71	65		58	63	55	73	383	822	170	100	94
28.....	73	63		61	61	55	73	370	660	167	100	92
29.....	71	67		55	60	55	73	374	602	161	120	92
30.....	68	63		60		55	73	416	553	161	120	88
31.....	71					56		406		153	113	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	83	68	72.5	0.361	0.42	4,460
November.....	83	58	67.8	.337	.38	4,030
December.....	68		61.5	.306	.35	3,780
January.....			59.0	.298	.34	3,680
February.....		55	59.7	.297	.32	3,430
March.....		53	57.5	.286	.33	3,540
April.....	85	57	69.3	.345	.38	4,120
May.....	808	76	374	1.86	2.14	23,000
June.....	909	388	642	3.19	3.56	38,200
July.....	502	153	269	1.34	1.54	16,500
August.....	144	98	114	.567	.65	7,010
September.....	104	86	92.4	.460	.51	5,500
The year.....	899	53	162	.806	10.92	117,000

## SHIELDS RIVER AT CLYDE PARK, MONT.

LOCATION.—Wire gage in NW¼ sec. 33, T. 2 N., R. 9 E., at highway bridge a quarter of a mile northwest of Clyde Park and 2 miles south of mouth of Brackett Creek.

DRAINAGE AREA.—544 square miles.

RECORDS AVAILABLE.—March 1921 to September 1923; April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 832 second-feet May 22 (gage height, 2.90 feet); minimum, 74 second-feet Aug. 20-21 (gage height, 1.06 feet).  
1921-23, 1929-32: Maximum discharge, 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 estimated for period of ice effect, Nov. 21 to Dec. 31, and Mar. 1-22, which are fair. Numerous diversions above and below station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	37	55	30	37	194	105	117	114	22	26
2.....	37	55	30	37	384	122	103	103	21	33
3.....	35	55	30	32	227	158	100	90	20	32
4.....	35	52	30	24	169	183	100	95	18	32
5.....	35	52	30	16	136	198	108	88	16	32
6.....	36	52	30	24	124	227	136	84	15	32
7.....	35	52	37	20	105	264	176	79	16	30
8.....	37	52	32	20	105	305	311	67	14	30
9.....	38	49	30	20	105	346	736	63	13	27
10.....	39	48	30	20	100	398	784	57	12	26
11.....	40	38	30	20	105	557	644	52	11	26
12.....	42	37	30	34	119	690	736	63	10	26
13.....	44	39	30	40	152	690	557	61	10	26
14.....	44	43	29	37	180	736	553	61	9.0	26
15.....	46	52	29	37	194	644	541	59	8.6	26
16.....	47	52	32	42	231	509	609	54	79	26
17.....	49	52	48	40	264	433	609	50	24	26
18.....	47	55	42	37	273	419	609	48	9.0	25
19.....	48	55	42	57	210	419	555	48	8.2	24
20.....	49	55	48	59	194	462	517	48	7.8	29
21.....	49	48	45	152	187	549	398	48	7.4	32
22.....	51	42	45	77	176	832	357	48	8.2	29
23.....	52	39	48	95	176	690	328	43	8.2	29
24.....	52	37	55	77	162	501	317	42	8.2	29
25.....	52	32	52	61	155	372	305	42	9.0	29
26.....	52	30	52	61	149	278	249	37	10	29
27.....	52	30	48	61	146	219	235	33	13	26
28.....	54	30	48	61	139	180	214	33	8.2	26
29.....	55	30	48	57	127	155	183	25	9.0	26
30.....	55	30	43	57	119	146	136	25	10	26
31.....	55	-----	39	61	-----	136	-----	24	12	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	55	35	45.1	2,770
November.....	55	30	44.9	2,670
December.....	55	29	38.5	2,370
March.....	152	16	47.5	2,920
April.....	384	100	170	10,100
May.....	832	105	385	23,700
June.....	784	100	377	22,400
July.....	114	24	57.5	3,540
August.....	79	7.4	14.4	885
September.....	33	24	28.0	1,670

## STILLWATER RIVER NEAR NYE, MONT.

LOCATION.—Chain gage in SE¼ sec. 32, T. 5 S., R. 15 E., at Beartooth Ranch, 1,000 feet below mouth of Woodbine Creek and 8 miles southwest of Nye.

RECORDS AVAILABLE.—May 1929 to September 1932 (discontinued). May 1924 to September 1927 at site above mouth of Woodbine Creek.

EXTREMES.—Maximum discharge during year, 4,420 second-feet June 24 (gage height, 7.10 feet); minimum, 32 second-feet Mar. 27 (gage height, 2.72 feet). 1929-32: Maximum discharge, that of June 24, 1932; minimum, 15 second-feet Mar. 17, 1931 (gage height, 2.48 feet).

REMARKS.—Records good except those of discharge above 2,000 second-feet and those estimated, Nov. 27-30, Mar. 7-11, which are poor. Stage-discharge relation affected by ice Mar. 7-11. Discharge not computed Dec. 1 to Feb. 29. No discharge measurements made during year. No diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	155	76	44	50	81	561	1,950	398	201
2	150	76	46	55	81	627	2,100	377	201
3	150	74	48	52	97	627	1,810	320	175
4	150	78	46	47	123	1,170	1,810	304	175
5	138	81	45	42	155	1,550	1,170	304	175
6	162	76	45	38	201	1,820	1,120	304	175
7	145	74	44	40	201	1,550	1,170	287	175
8	138	78	44	40	201	1,120	1,290	287	175
9	127	76	42	42	228	870	1,290	272	175
10	120	74	42	46	287	780	1,170	272	162
11	118	78	40	47	398	870	1,420	272	162
12	123	76	40	50	531	1,060	1,480	272	150
13	118	71	40	57	870	1,290	1,420	272	150
14	105	71	40	71	1,620	1,810	1,680	257	160
15	93	62	39	74	1,120	2,750	1,010	257	160
16	89	67	38	78	700	2,750	960	257	150
17	89	61	39	76	627	2,250	960	228	150
18	85	62	36	78	915	2,100	870	228	160
19	83	67	36	87	1,290	1,950	825	228	150
20	83	74	36	95	1,620	1,950	664	214	150
21	83	71	36	93	2,580	2,750	627	201	145
22	85	52	42	101	2,750	3,320	561	201	138
23	87	60	47	99	1,550	3,950	561	201	138
24	89	61	47	97	1,060	4,180	501	214	132
25	87	50	42	89	740	4,180	501	214	127
26	87	50	37	87	627	3,320	446	214	127
27	83	32	32	85	531	2,930	446	201	127
28	78	50	35	87	501	2,750	446	201	127
29	81	40	80	80	594	2,410	446	201	127
30	81	45	81	740	2,410	398	201	127	127
31	78	51	51	664	664	398	201	127	127

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	162	78	108	6,640
November	81	32	66.5	3,960
March	51	32	41.4	2,550
April	101	38	69.8	4,090
May	2,750	81	764	47,000
June	4,180	561	2,060	123,000
July	2,100	398	1,020	62,700
August	398	201	254	15,600
September	201	127	154	9,160

## CLARK FORK BELOW CRANDALL CREEK, WYO.

LOCATION.—Water-stage recorder in sec. 1, T. 56 N., R. 106 W., 2 miles below mouth of Crandall Creek.

DRAINAGE AREA.—401 square miles.

RECORDS AVAILABLE.—August 1929 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year ending Sept. 30, 1931, 5,100 second-feet June 3 (gage height, 5.90 feet); minimum occurred during winter. Maximum discharge during year ending Sept. 30, 1932, 6,430 second-feet June 25 (gage height, 7.16 feet); minimum occurred during winter.

1929-32: Maximum discharge, that of June 25, 1932; minimum occurred during winter.

REMARKS.—Records excellent for year ending Sept. 30, 1931, except those for period of ice effect, Oct. 19 to Apr. 9, which were based on four discharge measurements and temperature records.

Records good for year ending Sept. 30, 1932, except those for period of ice effect, Nov. 12 to Apr. 18, which were based on five discharge measurements and temperature records. Discharge estimated July 6, 7, 1931. No diversions above station.

*Discharge, in second-feet, 1930-32*

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31											
1	140	180					275	2,480	742	378	140
2	140	173					288	2,800	626	332	140
3	164	160					328	3,950	492	279	118
4	208	230					378	3,640	432	258	106
5	200	215					378	3,000	404	246	97
6	226	211					404	2,900	396	234	94
7	800	211					626	3,110	400	218	94
8	1,240	180					461	3,220	432	204	93
9	900	180					432	3,110	404	190	93
10	830	146					378	2,900	404	176	93
11	878	137					432	2,900	378	167	93
12	742	134	* 68				702	2,580	378	167	93
13	662	129					1,020	2,270	352	292	93
14	590	126					1,320	2,270	352	288	93
15	523						1,960	2,270	378	258	93
16	432						2,380	2,380	352	246	93
17	432	120					2,690	2,270	352	230	93
18	404						2,060	1,850	352	215	91
19	378						1,430	1,430	328	200	93
20	352						1,020	1,220	305	186	193
21	352				* 54	* 93	786	1,180	301	180	170
22	305						662	1,180	288	183	132
23	296	105		* 38			925	1,180	284	173	124
24	284						1,540	1,180	284	164	160
25	271						2,160	1,120	279	151	180
26	254						2,800	1,120	279	140	193
27	242						2,900	1,220	292	137	180
28	208	100					2,270	1,180	328	126	180
29	211						1,850	1,080	305	116	193
30	271						1,640	925	492	104	190
31	271						1,960		432	226	

\* Result of discharge measurement.

*Discharge, in second-feet, of Clark Fork below Crandall Creek, Wyo., 1930-32—Con.*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
<b>1931-32</b>												
1	190	111						137	1,630	4,000	694	170
2	193	118						167	1,510	3,770	543	154
3	183	121						215	1,630	3,450	461	170
4	176	118						373	2,150	2,830	410	146
5	167	116						410	2,620	2,220	378	135
6	190	114						352	2,700	1,920	352	124
7	200	104						383	2,420	1,930	324	121
8	176	101						536	2,210	2,000	310	116
9	197	98						710	2,000	2,130	305	116
10	170	95						1,120	1,960	2,040	305	121
11	146	98						1,500	2,040	2,100	305	121
12	137							1,940	2,130	2,130	305	118
13	132							2,310	2,530	2,240	305	114
14	124							2,730	3,140	2,290	305	108
15	114							2,530	3,610	2,400	310	106
16	108	85			* 63		240	2,080	3,740	1,930	305	100
17	98						260	2,080	3,970	1,660	292	100
18	88		* 52				275	2,380	3,710	1,560	275	98
19	88			* 53			246	2,880	3,740	1,540	254	97
20	90					* 58	250	3,470	3,580	1,450	246	104
21	88						242	4,230	3,930	1,240	254	132
22	90						222	4,570	4,680	1,080	230	106
23	90						208	3,320	5,360	965	222	97
24	90						180	2,580	5,720	878	211	91
25	91						173	2,090	5,870	821	193	85
26	104	75					167	1,650	5,050	777	186	85
27	94						157	1,300	4,400	751	186	84
28	93						151	1,240	4,300	768	193	83
29	91						134	1,620	4,200	840	230	82
30	95						134	1,970	4,200	804	222	81
31	114							1,840		742	193	
Month							Maximum	Minimum	Mean	Run-off in acre-feet		
<b>1930-31</b>												
October							1,240	140	42*	26,200		
November							230		139	8,270		
December									68	4,180		
January									40	2,460		
February									40	2,220		
March									60	3,690		
April									100	5,950		
May							2,900	275	1,240	76,200		
June							3,950	925	2,130	127,000		
July							742	279	381	23,400		
August							378	104	20*	12,900		
September							193	91	127	7,560		
The year							3,950		414	300,000		
<b>1931-32</b>												
October							200	88	129	7,930		
November							121		90.3	5,370		
December									55	3,380		
January									55	3,380		
February									60	3,450		
March									65	4,000		
April							275		176	10,500		
May							4,570	137	1,760	108,000		
June							5,870	1,510	3,360	200,000		
July							4,000	742	1,780	109,000		
August							694	186	300	18,400		
September							170	81	112	6,660		
The year							5,870		663	480,000		

\* Result of discharge measurement.

## CLARK 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 State line.

RECORDS AVAILABLE.—July 1921 to September 1932.

EXTREMES.—Maximum discharge during year, 8,290 second-feet June 25 (gage height, 5.60 feet); minimum, 138 second-feet Mar. 26 (gage height, 0.58 foot).  
1921-32: Maximum discharge, 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. No record Nov. 22 to Mar. 16. Numerous diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	326	190	-----	190	250	2,070	4,850	695	314
2.....	370	204	-----	218	286	1,980	5,100	578	296
3.....	250	204	-----	250	306	2,180	4,850	551	280
4.....	326	218	-----	218	444	2,260	4,100	501	250
5.....	326	234	-----	218	679	3,120	2,670	551	222
6.....	268	250	-----	218	1,620	3,360	2,670	454	222
7.....	268	250	-----	190	720	3,120	2,360	454	208
8.....	286	234	-----	190	808	4,350	2,260	410	208
9.....	268	218	-----	190	850	2,670	2,260	410	196
10.....	268	218	-----	190	1,490	2,460	2,260	478	222
11.....	268	190	-----	154	1,760	2,670	2,460	551	222
12.....	286	190	-----	190	2,240	2,670	2,890	501	222
13.....	286	218	-----	250	2,800	3,120	3,120	410	222
14.....	286	204	-----	306	3,410	3,360	2,890	454	208
15.....	268	204	-----	370	3,410	5,100	2,460	432	208
16.....	268	190	-----	306	2,610	5,610	1,980	410	208
17.....	250	178	154	394	2,420	5,350	1,980	369	196
18.....	250	165	178	418	2,420	4,850	1,720	390	183
19.....	268	165	204	370	3,200	5,100	1,800	331	172
20.....	250	165	204	326	3,860	4,600	1,640	290	172
21.....	218	165	190	326	4,590	5,100	1,410	369	222
22.....	204	-----	165	348	6,650	5,610	1,270	331	222
23.....	204	-----	151	326	4,350	6,650	1,020	331	222
24.....	190	-----	183	286	3,360	7,730	770	314	208
25.....	204	-----	165	250	2,460	7,730	810	296	208
26.....	204	-----	140	250	1,890	7,190	810	296	208
27.....	190	-----	165	234	1,410	6,650	810	280	208
28.....	190	-----	165	268	1,270	6,130	810	264	196
29.....	204	-----	165	250	1,340	6,130	810	264	208
30.....	190	-----	163	218	2,160	5,610	858	454	208
31.....	190	-----	163	-----	1,980	-----	729	578	-----
Month				Maximum	Minimum	Mean		Run-off in acre-feet	
October.....				370	190	252		15,500	
November 1-21.....				250	165	203		8,460	
March 17-31.....				204	140	169		5,030	
April.....				418	154	263		15,700	
May.....				6,650	250	2,160		133,000	
June.....				7,730	1,980	4,480		267,000	
July.....				5,100	729	2,140		132,000	
August.....				695	264	419		25,800	
September.....				314	172	218		13,000	



## CLARK 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 September 1932.

EXTREMES.—Maximum discharge during year, 9,500 second-feet June 8 (gage height, 9.20 feet); minimum, 206 second-feet Nov. 24 (gage height, 2.97 feet; ice).

1921-32: Maximum discharge, 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 estimated for period of ice effect, Nov. 23 to Dec. 31, which are fair. Numerous diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	596	389	330	-----	364	606	1,990	4,400	795	316
2.....	560	414	347	-----	405	540	1,860	4,250	677	330
3.....	560	426	336	-----	405	540	1,630	4,100	606	347
4.....	560	426	308	-----	405	571	1,860	3,500	509	316
5.....	560	426	319	-----	382	677	2,510	2,650	454	316
6.....	560	426	269	-----	364	883	3,800	2,250	405	270
7.....	596	426	279	-----	364	1,990	3,650	2,120	405	260
8.....	631	426	274	-----	364	754	7,680	2,120	430	260
9.....	596	426	308	-----	347	839	3,500	2,120	382	260
10.....	596	426	293	-----	347	1,180	2,930	2,120	347	540
11.....	560	426	298	-----	330	1,630	2,930	1,990	482	430
12.....	560	395	293	-----	347	1,990	2,930	2,380	405	364
13.....	526	395	274	-----	405	2,380	2,930	2,650	347	330
14.....	526	376	264	-----	382	2,930	3,500	2,650	347	330
15.....	492	319	274	-----	454	3,500	4,550	2,650	364	330
16.....	492	401	288	-----	482	2,930	5,650	2,250	330	330
17.....	492	420	325	-----	482	2,510	5,490	1,860	330	316
18.....	459	401	407	-----	509	2,650	4,700	1,860	347	330
19.....	492	389	389	-----	540	2,930	4,550	1,740	316	330
20.....	459	414	383	-----	454	3,650	4,250	1,860	302	330
21.....	459	246	395	-----	454	3,800	4,400	1,630	302	330
22.....	459	269	376	382	509	5,490	5,010	1,300	302	330
23.....	459	269	353	330	482	4,700	5,970	1,080	302	364
24.....	426	206	308	316	482	3,500	5,970	978	290	347
25.....	401	288	330	302	540	2,930	6,130	930	279	347
26.....	426	303	342	347	405	2,380	6,610	839	279	347
27.....	401	308	330	364	405	1,990	5,810	754	279	330
28.....	420	293	336	364	454	1,630	5,330	714	279	347
29.....	383	279	342	405	482	1,630	4,850	795	302	330
30.....	376	303	314	405	540	1,990	4,700	754	290	330
31.....	383	-----	225	382	-----	2,120	-----	795	316	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	631	376	499	30,700
November.....	426	206	364	21,700
December.....	407	225	320	19,700
March 22-31.....	405	-----	360	7,140
April.....	540	330	430	25,600
May.....	5,490	540	2,190	135,000
June.....	7,680	1,630	4,260	253,000
July.....	4,400	714	2,000	123,000
August.....	795	279	381	23,400
September.....	540	260	335	19,900

## SUNLIGHT CREEK NEAR PAINTER, WYO.

LOCATION.—Water-stage recorder in sec. 16, T. 55 N., R. 105 W., 1 mile east of Painter.

DRAINAGE AREA.—139 square miles.

RECORDS AVAILABLE.—August 1929 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 2,110 second-feet June 26 (gage height, 4.31 feet); minimum occurred during winter.

1929-32: Maximum discharge, that of June 26, 1932; minimum occurred during winter.

REMARKS.—Records good except those for period of ice effect, Nov. 17 to Apr. 12, July 2-4, Sept. 9-20, 23-30, which were based on five discharge measurements and temperature records. Minor diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	30						29	248	926	150	67
2	50	30						33	227	700	134	62
3	49	31					30	44	212	600	127	62
4	46	32						60	230	460	122	57
5	43	32						61	303	372	117	56
6	50	31						57	338	377	113	54
7	51	31						56	346	400	108	53
8	51	32					35	69	350	426	107	52
9	51	33						96	330	413	104	52
10	48	38						172	310	400	114	56
11	39	32					40	236	330	408	124	56
12	37	49					40	282	330	475	106	52
13	36	47					40	334	377	490	100	50
14	36	38					41	386	598	445	94	50
15	34	38					33	310	814	346	92	50
16	35	37					37	202	807	310	92	48
17	34						47	181	652	292	85	46
18	34					a 19	40	260	646	303	82	46
19	34	32				a 25	33	300	652	322	80	44
20	34		a 28				37	390	598	275	81	48
21	34	28		b 28			37	586	751	239	80	63
22	34	21					36	652	968	218	76	58
23	36						32	377	1,150	202	70	46
24	35	20					29	310	1,200	198	69	45
25	34						28	275	1,380	195	66	44
26	37						28	251	1,340	190	64	44
27	36						28	239	1,570	181	76	43
28	32	22					28	212	1,180	188	67	42
29	32						28	221	1,040	179	81	42
30	32						29	266	1,010	172	79	41
31	30							263		162	70	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	52	30	39.2	2,410
November	49		30.3	1,800
December			26	1,600
January			26	1,600
February			24	1,380
March			27	1,660
April	47		33.9	2,020
May	652	29	233	14,300
June	1,570	212	676	40,200
July	926	162	350	21,500
August	150	64	94.5	5,810
September	67	41	51.0	3,030
The year	1,570		134	97,300

• Result of discharge measurement.

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 955 second-feet May 21, June 15, 24 (gage height, 3.80 feet); minimum, 32 second-feet Apr. 15 and May 1 (gage height, 1.12 feet).

REMARKS.—Records fair. Discharge interpolated Apr. 30. Several diversions above gage.

*Discharge, in second-feet, 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		32	247	633	247	123	16	35	305	843	493	178	87
2		42	285	585	247	123	17	36	247	735	407	178	87
3		43	365	449	211	103	18	33	539	683	407	178	87
4		53	407	449	211	103	19	33	585	585	449	178	87
5		57	449	407	211	103	20	36	735	683	407	148	87
6		61	428	407	211	103	21	37	955	735	407	178	87
7		49	365	407	211	103	22	37	683	899	365	178	87
8		53	386	386	178	103	23	36	493	843	325	178	87
9		61	325	449	211	103	24	36	407	955	325	178	87
10		79	285	365	211	103	25	35	386	899	325	148	87
11		107	266	449	211	123	26	35	247	789	285	148	87
12		133	407	493	178	103	27	35	178	735	325	148	73
13		285	449	585	178	103	28	37	148	683	325	148	73
14		493	585	539	178	103	29	36	247	683	285	178	73
15	32	345	955	493	178	103	30	34	285	633	325	178	73
							31		325		285	123	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 15-30	37	32	35.2	1,120
May	955	32	279	17,200
June	955	247	586	34,900
July	633	285	414	25,600
August	247	123	184	11,800
September	123	73	95.1	5,660
The period				95,700

## ROCK CREEK AT ROCKVALE, MONT.

LOCATION.—Wire gage in NE¼ 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 to September 1932. EXTREMES.—Maximum discharge during year, 2,310 second-feet June 8 (gage height, 8.10 feet); minimum, 2.5 second-feet Aug. 4 (gage height, 3.60 feet).

1920-22, 1932: Maximum discharge, that of June 8, 1932; minimum, 0.6 second-foot July 16, 1921.

REMARKS.—Records good. Discharge estimated Aug. 12-15. Numerous diversions.

*Discharge, in second-feet, 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		396	520	832	3.7	23	16	168	838	1,750	131	29	131
2		444	444	770	3.7	27	17	181	745	1,600	93	26	103
3		628	420	801	7.3	70	18	181	715	1,450	56	18	93
4		600	373	832	2.8	84	19	168	838	1,380	37	9.1	84
5		469	396	596	46.0	63	20	168	1,000	1,310	29	9.1	79
6		685	1,420	465	7.3	40	21	168	1,140	1,310	27	13	103
7		685	1,500	294	12.0	33	22	223	1,420	1,310	19	13	119
8		520	2,230	235	7.3	31	23	208	1,000	1,310	12	16	131
9		469	2,070	143	5.5	21	24	208	745	1,310	10	15	103
10		469	1,170	88	3.1	125	25	208	628	1,310	5.5	16	119
11		469	1,170	52	3.7	149	26	194	546	1,600	3.7	19	131
12		520	1,520	56	8.8	143	27	194	469	1,380	3.7	19	162
13		628	1,310	227	14	149	28	239	444	1,240	3.7	19	149
14		838	1,450	219	19	137	29	223	469	1,030	3.1	21	143
15		1,060	1,600	219	24	119	30	291	520	1,030	4.3	29	137
							31		546		3.1	27	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 16-30	291	168	214	6,370
May	1,420	396	676	41,600
June	2,230	373	1,260	75,000
July	832	3.1	202	12,400
August	46	2.8	15.0	322
September	162	21	100	5,950
The period				142,000

## 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 September 1932.

EXTREMES.—Maximum discharge, 861 second-feet June 24–25 (gage height, 3.96 feet); minimum, 13 second-feet Sept. 30 (gage height, 1.14 feet).

REMARKS.—Records good. Discharge interpolated May 17, June 12, 14, 16, 19. Several small diversions above gage.

*Discharge, in second-feet, 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		25	147	345	89	33	16	23	262	540	150	61	24
2		24	152	367	67	29	17	22	228	412	139	52	23
3		25	147	345	66	28	18	20	193	389	139	57	23
4		34	187	302	64	25	19	19	282	378	144	45	22
5		39	226	210	61	23	20	19	345	367	126	48	20
6		44	262	178	56	24	21	19	457	367	106	47	21
7		39	226	178	54	25	22	19	434	457	93	46	20
8		42	345	184	53	25	23	18	389	621	84	41	19
9		51	324	203	53	24	24	17	302	813	75	45	20
10		84	302	187	62	39	25	17	226	861	57	34	19
11		91	345	206	75	24	26	17	206	621	57	29	19
12		122	356	282	62	25	27	18	158	345	64	31	16
13		203	367	244	62	27	28	17	147	324	97	41	14
14		262	518	262	54	24	29	17	163	324	73	33	14
15	26	262	669	187	57	23	30	24	193	367	75	36	14
							31		181		75	28	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 15-30	26	17	19.5	619
May	457	24	178	10,900
June	861	147	392	23,300
July	367	57	169	10,400
August	89	28	51.9	3,190
September	39	14	22.9	1,360
The period				49,800

## 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 9; relation to old datum unknown.

RECORDS AVAILABLE.—April to September 1932.

EXTREMES.—Maximum discharge, 1,400 second-feet June 8 (gage height, 7.34 feet, old datum); minimum, 24.4 second-feet Aug. 4 (gage height, 2.40 feet).

REMARKS.—Records good. No record June 11–18. Numerous diversions above gage.

*Discharge, in second-feet, 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		157	173	210	54	73	16	66	232		140	54	69
2		189	157	223	49	73	17	65	206		126	65	63
3		334	142	223	36	78	18	61	189		111	69	58
4		277	128	236	28	78	19	53	181	348	111	65	54
5		232	128	210	27	76	20	54	214	305	114	61	61
6		315	115	210	29	71	21	62	206	291	111	61	60
7		296	391	184	31	65	22	74	232	277	114	60	65
8		241	451	181	33	61	23	69	214	250	114	58	65
9		214	1,050	168	34	52	24	74	206	250	100	58	65
10		198	878	163	31	61	25	74	198	250	102	56	65
11		189	558	163	33	78	26	74	206	334	98	58	69
12		189		176	36	78	27	69	181	291	84	58	71
13		189		158	44	76	28	80	173	277	69	58	63
14		198		150	47	71	29	66	157	250	63	58	61
15		241		150	51	69	30	109	165	236	58	60	58
							31		173		52	65	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 16–30	109	53	70.0	2,080
May	334	157	213	13,100
July	236	52	141	8,670
August	69	27	49.3	3,030
September	78	52	66.9	3,980

## 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 1932.

EXTREMES.—Maximum discharge during year, 8,780 second-feet June 24 (gage height, 6.95 feet); minimum probably occurred during winter.

1906-8, 1911-27, 1929-32: Maximum discharge, 12,300 second-feet June 14, 1906; minimum, 170 second-feet Dec. 16, 1926.

REMARKS.—Records excellent except those for period of ice effect, Nov. 29 to Mar. 11, which were based on two discharge measurements, temperature records, and comparison with Big Horn River at Thermopolis. Small irrigation diversions above station. Gage-height record furnished by United States Bureau of Reclamation.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	376	383			300	238	327	1,720	5,950	1,360	705
2	414	390				296	327	1,670	5,420	1,280	627
3	362	383				383	308	1,630	4,950	1,140	573
4	390	383				355	369	1,630	4,120	1,030	504
5	390	369				296	665	2,320	3,340	984	470
6	406	390			220	278	798	2,620	2,640	949	438
7	390	355				244	645	2,880	2,210	972	376
8	438	383				222	504	2,930	2,020	938	320
9	454	398				227	618	2,450	1,980	905	290
10	414	376				216	872	2,260	2,060	927	272
11	496	355			180	200	1,180	2,250	2,210	996	260
12	512	290			178	200	1,560	2,280	2,620	1,130	272
13	414	314			278	244	2,180	2,540	2,990	1,080	260
14	406	296			272	302	3,220	3,150	3,040	984	284
15	406	334			272	430	3,450	4,100	2,990	938	278
16	414	334	* 183	* 207	290	406	2,950	5,450	2,580	905	272
17	398	314			284	414	2,480	5,550	2,160	850	272
18	398	266			334	573	2,930	4,920	1,880	861	266
19	414	260			406	504	3,400	4,530	1,800	861	254
20	414	260			383	390	3,880	4,000	1,980	861	290
21	414	290			341	414	4,410	3,760	2,090	861	296
22	504	196			302	383	6,060	4,340	1,940	883	296
23	406	102			302	355	5,450	5,650	1,730	905	278
24	369	136			296	296	3,500	6,760	1,410	872	272
25	414	182			284	254	2,500	7,640	1,320	818	284
26	422	210			266	260	2,060	7,700	1,230	756	302
27	390	178			290	327	1,850	7,280	1,160	735	308
28	362	182			308	341	1,820	7,030	1,150	705	290
29	362	180			348	320	1,650	6,600	1,130	665	302
30	398	175			327	302	1,990	6,210	1,15	695	232
31	376				266		2,070		1,200	798	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	512	362	410	25,200
November	398	102	289	17,200
December			200	12,300
January			220	13,500
February			240	13,800
March	406		284	17,500
April	573	200	322	19,200
May	6,060	308	2,130	131,000
June	7,700	1,630	4,130	246,000
July	5,950	1,130	2,400	148,000
August	1,360	665	924	56,800
September	705	232	338	20,100
The year	7,700		992	721,000

\* Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 11,800 second-feet June 26 (gage height, 8.16 feet); minimum, 279 second-feet Nov. 22 (gage height, 0.16 foot).

1900-1905, 1910-32: Maximum discharge, 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 good. Practically no diversions between mouth of Wind River and Thermopolis.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	463	824	417	441	430	1,440	625	896	3,230	9,120	1,530	1,030
2	545	788	381	441	540	1,430	719	1,020	3,260	8,710	1,590	1,010
3	525	788	427	448	520	1,000	860	1,050	2,890	7,850	1,530	941
4	578	788	438	438	463	678	914	1,040	2,770	7,090	1,370	896
5	571	788	475	434	448	632	1,030	1,260	3,750	5,890	1,300	860
6	558	770	448	438	452	625	950	1,820	4,690	4,530	1,240	762
7	520	762	414	444	463	571	753	1,830	5,170	3,640	1,240	694
8	552	694	430	438	455	520	692	1,540	5,800	3,040	1,240	597
9	545	770	463	438	471	393	753	1,480	4,420	2,820	1,130	505
10	670	788	448	448	491	417	632	1,610	4,510	2,920	1,140	471
11	710	736	441	444	479	505	618	2,030	5,230	2,830	1,170	463
12	797	702	444	444	463	571	578	2,680	3,710	2,820	1,216	505
13	806	552	393	448	463	597	552	3,640	3,550	3,550	1,240	535
14	736	625	378	444	434	520	604	4,960	3,970	3,690	1,300	520
15	685	597	396	444	434	530	762	5,510	5,140	3,590	1,310	500
16	710	655	402	424	444	545	1,050	6,920	6,940	3,390	1,320	487
17	702	648	384	399	463	640	1,010	6,980	7,980	2,960	1,280	487
18	694	597	396	378	459	710	977	5,590	8,460	2,750	1,210	475
19	694	505	396	387	463	770	1,130	5,500	7,890	2,380	1,150	487
20	685	505	396	424	471	887	1,120	6,900	7,450	2,300	1,110	483
21	719	352	408	438	479	878	1,010	7,810	6,120	2,460	1,100	483
22	753	294	427	434	479	941	977	8,670	6,270	2,470	1,080	479
23	880	291	427	441	500	923	1,020	10,800	7,190	2,280	1,080	500
24	815	315	441	430	475	923	977	8,060	8,550	1,930	1,100	479
25	815	360	434	396	444	950	878	8,820	10,200	1,680	1,080	479
26	923	384	430	427	471	932	797	4,720	11,600	1,620	1,060	495
27	824	483	441	483	584	914	736	4,360	11,400	1,530	1,020	487
28	806	479	452	463	1,180	932	719	3,830	10,500	1,470	986	495
29	797	479	471	495	1,460	869	923	3,580	10,000	1,360	968	500
30	719	414	471	510	-----	806	914	3,340	9,540	1,440	959	505
31	806	-----	448	430	-----	744	-----	4,540	-----	1,460	986	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	923	463	696	42,800
November	824	291	591	35,200
December	475	378	426	26,200
January	510	378	438	26,900
February	1,460	430	530	30,500
March	1,440	393	768	47,200
April	1,130	552	842	50,100
May	10,800	896	4,280	263,000
June	11,600	2,770	6,410	381,000
July	9,120	1,360	3,400	209,000
August	1,590	959	1,190	73,200
September	1,030	463	587	34,900
The year	11,600	291	1,680	1,220,000



## 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. Prior to Apr. 25, 1932, chain gage 150 feet downstream was used.

DRAINAGE AREA.—15,900 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 18,100 second-feet June 25 (gage height, 9.02 feet); minimum, 349 second-feet Nov. 22 (gage height, 0.26 foot). 1928-32: Maximum discharge, that of June 25, 1932; minimum, 250 second-feet July 19, 1931 (gage height, 0.00 foot).

REMARKS.—Records good except those for period of ice effect, Nov. 27 to Mar. 19, which were based on two discharge measurements, temperature records, and comparison with Big Horn River at Thermopolis. Discharge interpolated Sept. 19, 20. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	833	1,200			1,800	1,500	1,330	5,740	11,200	1,300	828
2	1,050	1,270				1,590	1,270	5,650	10,800	1,250	705
3	1,040	1,250				1,630	1,260	5,320	10,300	1,260	750
4	1,000	1,230				1,900	1,660	4,960	9,660	1,300	798
5	1,050	1,240				2,510	2,060	4,730	8,870	1,310	774
6	1,020	1,230			900	1,870	3,370	5,260	7,840	1,230	725
7	1,050	1,220				1,720	5,320	6,670	7,020	1,050	670
8	1,180	1,200				1,520	3,670	8,520	5,940	996	622
9	1,130	1,200				1,440	3,150	10,100	5,040	948	582
10	1,100	1,210	" 816			1,380	3,040	8,520	4,310	926	948
11	1,150	1,200			1,200	1,320	3,470	8,020	3,850	877	1,100
12	1,230	1,210				1,240	4,220	8,000	3,560	840	1,040
13	1,220	1,210		" 859		1,260	6,130	7,790	3,370	792	685
14	1,220	1,150				1,370	9,720	7,400	3,280	786	622
15	1,260	1,200				1,450	9,120	7,400	3,250	891	606
16	1,180	1,200			2,100	1,650	8,740	7,740	3,250	905	598
17	1,200	1,200				1,930	7,760	8,600	3,330	840	594
18	1,140	1,200				2,100	7,500	9,600	3,370	780	610
19	1,140	1,110				2,030	7,890	10,200	3,280	735	612
20	1,160	1,080				3,530	1,800	13,800	3,150	710	616
21	1,130	661			2,980	1,830	12,800	9,810	2,940	655	618
22	1,130	357			2,540	2,090	13,400	9,320	2,760	650	756
23	1,160	410			2,510	2,200	17,300	8,900	2,670	675	720
24	1,140	493			2,090	2,300	14,000	8,930	2,620	675	735
25	1,170	471			2,020	2,050	11,500	10,600	2,530	685	730
26	1,210	455			1,740	1,620	9,460	14,500	2,370	695	730
27	1,330	700			1,770	1,240	7,890	13,800	2,110	695	735
28	1,560		1,670	1,180	6,620	13,300	1,870	740	740	740	
29	1,340		1,650	1,170	5,760	13,000	1,660	798	750	750	
30	1,270		1,680	1,350	5,320	11,900	1,520	1,440	792	792	
31	1,220			1,720			5,590		1,410	1,060	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,560	833	1,160	71,300
November	1,270	357	989	58,800
December			810	49,800
January			850	52,300
February			1,100	63,300
March	3,530		1,740	107,000
April	2,510	1,170	1,670	96,400
May	17,300	1,260	6,910	425,000
June	14,500	4,730	8,820	525,000
July	11,200	1,410	4,490	276,000
August	1,440	650	919	56,500
September	1,100	582	726	43,200
The year	17,300	357	2,520	1,830,000

\* Result of discharge measurement.

## 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 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 31,500 second-feet June 9 (gage height, 9.53 feet); minimum occurred during February.

1904-25; 1928-32; Maximum discharge, 45,900 second-feet Mar. 11, 1929 (gage height, 11.1 feet); minimum, 440 second-feet July 23, 1931 (gage height, 1.50 feet).

REMARKS.—Records good except those estimated for period of ice effect, Nov. 22 to Mar. 23, which are fair. Numerous diversions. Some storage on tributary streams.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,940	1,730	1,110	920	1,110	1,240	2,160	2,420	8,500	23,300	2,160	2,420
2	1,800	1,800					2,160	2,600	8,080	20,100	2,080	2,160
3	1,800	1,800					2,240	4,140	8,080	18,200	2,080	3,200
4	1,800	1,730					2,420	4,140	7,270	15,200	2,080	3,420
5	1,870	1,660					2,420	3,200	6,530	13,400	2,000	3,420
6	1,870	1,660	1,020	940	810	1,390	2,330	4,140	7,670	13,400	2,000	3,200
7	2,020	1,800					2,160	3,890	9,850	9,850	1,770	3,200
8	2,020	1,800					2,080	3,890	17,000	8,940	1,700	2,990
9	2,020	1,800					2,000	6,530	31,500	6,890	1,620	2,600
10	1,940	1,730					1,920	8,940	18,200	6,180	1,620	2,240
11	2,020	1,730	1,020	940	810	1,390	1,920	11,300	14,600	5,850	1,480	3,200
12	2,020	1,660					1,840	14,600	10,800	5,850	1,480	3,420
13	2,020	1,660					1,770	14,600	14,000	5,850	1,700	3,420
14	2,020	1,660					1,770	17,000	12,900	5,240	1,770	3,420
15	2,020	1,660					1,770	15,200	13,400	4,950	2,000	3,200
16	1,940	1,660	1,140	960	980	2,950	1,920	12,300	13,400	4,670	2,000	2,990
17	1,870	1,600					1,920	9,390	17,600	4,670	1,920	2,990
18	1,870	1,600					2,080	7,670	18,800	4,400	1,770	2,990
19	1,800	1,600					2,330	9,850	20,100	4,400	1,700	2,990
20	1,800	1,540					2,420	13,400	18,800	4,140	1,550	3,200
21	1,800	1,540	1,260	960	980	2,600	2,420	15,200	17,600	4,140	1,340	3,420
22	1,870						2,600	18,200	15,200	3,890	1,280	2,990
23	1,870						2,790	21,400	17,600	3,890	1,480	2,790
24	1,800						2,990	20,100	18,800	3,650	1,550	2,600
25	1,800						2,990	16,400	20,100	3,650	1,620	2,420
26	1,870	1,140	1,260	960	980	2,600	2,420	2,790	14,000	24,000	2,990	2,240
27	1,940						2,420	2,600	13,400	28,700	2,790	2,160
28	2,020						2,330	2,420	10,800	24,600	2,420	2,080
29	2,180						2,160	2,420	9,390	24,600	2,240	2,080
30	2,180						2,160	2,330	6,890	23,300	2,240	1,920
31	1,870						2,160	7,270			2,240	2,990

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,180	1,800	1,920	118,000
November	1,800		1,520	90,400
December			1,130	69,500
January			941	57,900
February			966	55,600
March	3,890		2,040	125,000
April	2,990	1,770	2,270	135,000
May	21,400	2,420	10,400	640,000
June	31,500	6,530	16,400	976,000
July	23,300	2,240	7,080	435,000
August	2,990	1,280	1,800	111,000
September	3,420	1,920	2,850	170,000
The year	31,500		4,110	2,980,000

## DRY CREEK NEAR BURRIS, WYO.

LOCATION.—Water-stage recorder in SW $\frac{1}{4}$  sec. 12, T. 4 N., R. 5 W., 2 miles south of Burris.

DRAINAGE AREA.—57 square miles.

RECORDS AVAILABLE.—May 1921 to September 1932.

EXTREMES.—Maximum discharge during year, 448 second-feet June 26 (gauge height, 2.34 feet); minimum, 1.4 second-feet Jan. 17, from discharge measurement.

1921-32: Maximum discharge, 1,100 second-feet June 12, 1921 (gauge height, 3.9 feet); minimum, that of Jan. 17, 1932.

REMARKS.—Records good. No records Nov. 1 to Apr. 15. Discharge interpolated Oct. 4. Dry Creek Ditch diverts water for irrigation above station. Gauge-height record furnished by United States Indian Service.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Jan.	Apr.	May	June	July	Aug.	Sept.
1.....	9.0			3.2	88	330	73	32
2.....	7.4			4.0	84	270	66	28
3.....	7.0			8.2	86	228	61	26
4.....	7.0			19	118	176	58	25
5.....	6.6			23	157	129	54	23
6.....	7.0			16	154	100	51	20
7.....	9.0			14	142	99	49	19
8.....	11			23	124	116	47	17
9.....	12			29	120	118	46	16
10.....	13			38	126	112	49	16
11.....	13			60	135	140	53	16
12.....	13			147	126	165	51	14
13.....	11			204	131	170	48	14
14.....	9.0			270	173	176	45	14
15.....	8.6			232	228	140	44	13
16.....	8.2		1.6	154	290	114	43	13
17.....	8.2	1.4	2.0	147	252	96	43	13
18.....	7.8		2.4	191	214	96	43	12
19.....	7.4		2.6	218	170	173	43	11
20.....	7.0		2.6	252	149	154	43	10
21.....	11		3.2	350	152	118	46	9.0
22.....	11		3.0	370	200	97	47	8.6
23.....	13		2.6	194	290	86	44	8.2
24.....	14		2.6	170	370	81	40	7.4
25.....			2.8	122	390	76	40	7.4
26.....			2.6	110	410	72	38	7.0
27.....			2.4	97	350	69	37	6.6
28.....			3.0	82	330	67	35	6.2
29.....			2.8	102	330	69	34	6.2
30.....			3.0	131	330	72	37	5.8
31.....				92		76	35	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	14	6.6	10.2	627
April 16-30.....	3.2	1.6	2.61	78
May.....	370	3.2	125	7,690
June.....	410	84	207	12,300
July.....	330	67	129	7,930
August.....	73	34	46.5	2,860
September.....	32	5.8	14.1	839

## WILLOW CREEK NEAR CROWHEART, WYO.

LOCATION.—Water-stage recorder in SW¼ 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 1932.

EXTREMES.—Maximum discharge during year, 310 second-feet May 21 (gage height, 2.56 feet); minimum occurred during winter.

1921-23, 1925-32: Maximum discharge, 750 second-feet July 26, 1923; minimum occurred during winter.

REMARKS.—Records good. No records November 1 to April 15. Discharge estimated October 18-21, 26-31, May 15, 16. Small diversion for irrigation above station. Gage-height record furnished by United States Indian Service.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	7.1	-----	8.0	55	66	15	9.5
2	7.1	-----	8.3	55	51	14	9.2
3	7.1	-----	8.3	64	44	13	9.2
4	7.1	-----	8.0	90	38	12	8.6
5	7.1	-----	8.6	116	31	12	8.6
6	7.3	-----	8.9	97	31	12	7.3
7	7.8	-----	8.6	81	31	12	7.6
8	7.8	-----	8.3	66	30	11	7.6
9	7.8	-----	8.3	63	33	11	8.0
10	7.8	-----	7.6	67	28	10	8.6
11	8.0	-----	7.6	75	31	10	8.6
12	7.8	-----	32	78	29	9.2	8.6
13	7.6	-----	80	87	28	9.2	8.6
14	7.3	-----	87	110	28	10	8.3
15	7.3	-----	76	166	23	9.5	8.3
16	7.3	6.9	65	164	21	8.9	7.6
17	7.3	6.7	54	127	20	8.9	8.0
18	7.5	6.7	76	110	20	8.6	7.8
19	7.5	6.9	92	84	25	8.6	8.6
20	7.5	7.3	118	80	20	8.9	8.6
21	7.8	8.0	184	94	18	8.9	9.2
22	7.8	8.0	192	118	17	8.6	9.2
23	7.8	7.8	86	135	15	8.6	8.9
24	7.8	7.6	71	114	16	9.5	8.0
25	7.8	7.6	66	127	15	9.2	8.6
26	7.0	7.6	61	106	14	9.5	8.6
27	7.0	7.3	52	94	14	9.8	8.9
28	7.0	7.6	47	87	14	9.5	8.6
29	7.0	7.3	64	84	14	9.8	8.6
30	7.0	7.6	76	78	14	10	8.0
31	7.0	-----	52	-----	17	10	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	8	7	7.43	457
April 16-30	8	6.7	7.39	220
May	192	7.6	55.5	3,410
June	166	53	95.7	5,690
July	66	14	25.7	1,580
August	15	8.6	10.2	627
September	9.5	7.3	8.46	503

## 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.—May 1918 to September 1932.

EXTREMES.—Maximum discharge during year, 2,880 second-feet June 26 (gage height, 6.75 feet); minimum occurred during winter.

1918-32: Maximum discharge, 3,990 second-feet June 16, 1918 (gage height, 4.3 feet, old datum); minimum, 9 second-feet Mar. 23, 30, 1931 (gage height, 3.18 feet).

REMARKS.—Records good except those for periods of ice effect, Nov. 18-21, Nov. 24 to May 8, which were based on fragmentary gage heights, two discharge measurements, 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, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.					
1	76	64	20	14	14	15	17	80	554	2,050	593	264					
2	76	64										542	1,970	584	244		
3	76	61										518	1,820	542	213		
4	70	58							16		16	548	1,600	503	191		
5	73	58		18			16	655	1,360	485	177						
6	70	58	18	20	16	12	15	125	818	1,100	477	164					
7	73	58									17		895	895	465	153	
8	73	58									15		810	850	457	150	
9	73	53											167	683	826	447	140
10	79	49											181	602	904	437	137
11	79	46	20	21	22	10	15	232	578	960	477	140					
12	76	42										328	554	1,150	495	140	
13	76	40							25			470	566	1,340	497	137	
14	76	37									12	648	634	1,370	455	144	
15	73	37									14	826	842	1,400	437	134	
16	70	35	18	32	37	15	22	818	1,160	1,200	415	134					
17	67	34							36			738	1,360	990	405	140	
18	64	32								25		762	1,300	850	417	137	
19	61	30							32			859	1,210	842	427	124	
20	58	30										970	1,110	1,020	437	134	
21	58	28	31	30	16	17	30	1,170	1,070	1,110	435	124					
22	56	26	20		15					1,520	1,200	980	435	118			
23	58	26						30	16		1,490	1,520	826	435	118		
24	58								15		1,160	1,960	706	405	112		
25	56							32		42	842	2,420	669	381	106		
26	67	22	14	25	14	18	65	714	2,690	648	357	100					
27	58											620	2,540	620	337	97	
28	56											548	2,230	602	317	91	
29	56											490	2,130	596	307	88	
30	58											536	2,080	596	295	82	
31	61							566		590	273						

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	79	56	67.1	4,130
November	64	---	39.3	2,340
December	---	---	18.5	1,140
January	---	---	24.6	1,510
February	---	---	18.2	1,050
March	---	---	14.9	916
April	---	---	28.1	1,670
May	1,520	---	562	34,600
June	2,690	518	1,190	70,800
July	2,050	590	1,050	64,600
August	596	273	431	26,500
September	264	82	141	8,390
The year	2,690	---	300	218,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 1,060 second-feet May 22 (gage height, 4.14 feet); minimum occurred during winter.

1921-32: Maximum discharge, 5,220 second-feet July 9, 1926 (gage height, 7.59 feet); minimum occurred during winter.

REMARKS.—Records good. No records Dec. 1 to Apr. 22. Discharge estimated Oct. 12-18, Nov. 1-6, 22-30, June 5-10. Water diverted for irrigation above station. Gage-height record furnished by United States Indian Service.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	30	40	-----	49	251	723	149	64
2	30	40	-----	84	225	618	138	56
3	29	38	-----	136	211	562	125	51
4	28	38	-----	154	333	480	119	50
5	28	36	-----	136	430	368	111	48
6	28	36	-----	101	570	288	106	46
7	31	34	-----	90	470	280	103	42
8	31	33	-----	108	470	284	96	38
9	31	32	-----	151	270	313	90	37
10	31	24	-----	187	270	317	92	35
11	34	26	-----	208	251	333	101	35
12	36	30	-----	257	238	372	96	34
13	34	31	-----	350	325	325	89	32
14	34	32	-----	475	435	350	84	31
15	32	30	-----	455	677	302	80	29
16	32	28	-----	288	777	248	78	28
17	30	22	-----	317	612	223	78	28
18	30	22	-----	422	572	218	79	27
19	28	24	-----	505	470	251	78	26
20	28	26	-----	579	425	251	76	25
21	31	27	-----	772	606	216	76	24
22	44	25	-----	888	603	194	78	24
23	45		43	455	856	176	74	24
24	55	41	45	345	970	170	70	24
25	48		41	302	921	180	64	25
26	58	22	46	294	974	168	61	25
27	43		45	231	804	157	60	25
28	45		46	208	777	156	57	24
29	51		43	234	753	152	54	24
30	37	50	50	325	753	149	69	24
31	42		-----	251	-----	156	69	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	58	28	35.9	2,210
November	40	-----	28.6	1,700
April 23-30	56	41	44.9	712
May	888	49	302	18,600
June	940	225	546	32,500
July	723	149	290	17,800
August	149	54	87.1	5,360
September	64	24	33.5	1,990

## 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 1932.

EXTREMES.—Maximum discharge during year, about 820 second-feet May 21 (by comparison with flow of Little Wind River); minimum occurred during winter.

1921-32: Maximum discharge, 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. No records for period Dec. 1 to Apr. 22. Discharge estimated Oct. 12-18, Nov. 1-6, 22-30, May 1-6, 22-27, July 10-15, Sept. 18-23. Water diverted for irrigation above station. Gage-height record furnished by United States Indian Service.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	28	40		40	286	581	114	42
2	27	40		75	282	552	104	41
3	26	38		120	294	504	100	40
4	25	38		140	366	444	91	40
5	25	37		120	486	384	86	38
6	25	37		95	528	322	84	36
7	30	37		80	514	275	79	34
8	29	37		95	426	246	76	33
9	28	34		144	353	236	69	31
10	28	30		164	335	240	69	29
11	32	32		192	326	260	68	29
12	34	29		224	318	340	60	28
13	32	33		290	331	310	62	28
14	32	36		394	412	330	59	27
15	30	33		504	542	280	59	26
16	30	30		435	655	268	59	26
17	28	28		403	664	243	58	26
18	28	33		467	571	220	56	26
19	28	29		542	518	206	53	26
20	28	26		622	476	206	51	26
21	30	33		754	472	206	50	25
22	36			820	518	194	48	25
23	39		30	480	611	176	46	25
24	45	30	28	360	716	164	46	25
25	44		28	350	732	151	45	25
26	44		38	330	732	142	45	25
27	44		36	300	682	130	45	25
28	45	38	38	268	638	126	44	25
29	45		40	275	622	122	42	24
30	42		45	314	611	120	45	24
31	42			294		118	44	
Month			Maximum	Minimum	Mean	Run-off in acre-feet		
October			45	25	33.2	2,040		
November			40		32.3	1,920		
April 23-30			45	28	35.4	562		
May			820	40	313	19,200		
June			732	282	500	29,800		
July			581	118	261	16,000		
August			114	42	63.1	3,880		
September			42	24	29.3	1,740		

## SOUTH FORK OF OWL CREEK AT CURTIS RANCH, NEAR THERMOPOLIS, WYO.

LOCATION.—Chain gage in sec. 10, T. 43 N., R. 99 W., 30 miles west of Thermopolis.

DRAINAGE AREA.—142 square miles.

RECORDS AVAILABLE.—November 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 618 second-feet May 22 (gage height, 2.42 feet); minimum discharge, 0.4 second-foot Mar. 24 (gage height, 0.57 foot).

REMARKS.—Records fair. Discharge estimated Nov. 28 to Dec. 5, Dec. 13, 19–23, Feb. 11–13, Aug. 20, 24, Sept. 14–24. Stage-discharge relation affected by ice Nov. 28 to Dec. 7. Diversions for irrigation above station. Gage-height record furnished by H. D. Curtis.

## Discharge, in second-feet, 1931–32

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.			0.7	1	1	8	3	52	70	12	7
2.			.7	.7	3	19	5	43	59	9	6
3.		0.8	.7	.6	2	26	16	44	50	8	6
4.			.6	.5	.9	16	46	86	48	7	5
5.			.7	.5	.9	14	43	113	37	7	4
6.		.9	.6	.5	.8	8	36	65	36	5	3
7.		.9	.6	.5	.9	5	24	60	41	6	3
8.		1	.7	.6	1	2	29	47	38	3	3
9.		1	.7	.5	.9	5	46	57	36	3	2
10.		1	.9	.6	.9	2	65	64	38	3	2
11.		1	.7	.6	1	1	107	67	33	3	2
12.		1	.8	.5	.9	12	120	89	32	3	2
13.		1	.7	.5	.7	16	126	169	31	3	2
14.		1	.8	.5	.7	26	144	234	29	3	1
15.		1	1	.5	.8	19	65	369	26	2	1
16.	0.7	.9	1	.5	.7	18	29	225	25	2	1
17.	.9	1	1	.5	.6	32	35	122	22	2	1
18.	1	1	.9	.5	.5	31	72	124	21	2	1
19.	1.4	1	.8	.5	.5	25	100	129	23	2	1
20.	.9	1	.8	.5	.5	26	234	129	20	2	1
21.	.7	1	.8	.5	1	19	432	131	19	2	1
22.	1	1	.7	.5	.7	14	297	257	15	2	1
23.	.9	1	.8	.7	.5	12	51	264	13	2	1
24.	1	.9	.9	.5	.4	12	46	243	14	1	1
25.	1	.9	.8	.5	2	9	40	291	16	1	2
26.	1	.7	.8	.5	1	8	33	102	18	1	3
27.	1	.6	.7	.5	.7	3	29	191	12	25	2
28.	.9	.7	.7	2	5	4	25	96	11	4	3
29.	.9	.7	.7	14	1	3	32	91	13	5	3
30.	.9	.5	.7		9	2	75	97	12	13	3
31.		.7	2		6		45		16	10	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November 16–30	1.4	0.7	0.95	28
December	1	.5	.88	54
January	1	.6	.81	50
February	14	.5	1.06	61
March	9	.4	1.50	92
April	32	1	13.2	786
May	432	3	79.0	4,860
June	360	43	134	7,970
July	70	11	28.0	1,720
August	25	1	4.9	301
September	7	1	2.5	149
The period				16,100



## SOUTH FORK OF OWL CREEK NEAR THERMOPOLIS, WYO.

LOCATION.—Chain gage in sec. 34, T. 9 N., R. 2 E., 26 miles northwest of Thermopolis and 200 feet below Red Creek.

DRAINAGE AREA.—191 square miles.

RECORDS AVAILABLE.—July 1921 to September 1922; May 1929 to Apr. 30, 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to April, 19 second-feet Apr. 30 (gage height, 1.44 feet); minimum occurred during winter.

1921-22, 1929-32: Maximum discharge, 468 second-feet Aug. 15, 1930 (gage height, 3.90 feet); no flow July 17, 21, 24, 1931.

REMARKS.—Records fair except those for period of ice effect, Nov. 29 to Mar. 20, which are based on two discharge measurements and temperature records. Discharge not computed for May to September. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

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

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	12	6	9.1	560
November	9	3	5.6	333
December			7	430
January			8	492
February			12	690
March	32		9.4	578
April	18	5	12.4	738
The period				3,820

• Result of discharge measurement.

## OWL CREEK NEAR THERMOPOLIS, WYO.

LOCATION.—Chain gage in sec. 19, T. 43 N., R. 95 W., at McCumber's ranch, 6 miles northwest of Thermopolis.

DRAINAGE AREA.—484 square miles.

RECORDS AVAILABLE.—July to October 1912; April 1915 to November 1917; November 1931 to November 1932 (discontinued).

EXTREMES.—Maximum discharge during period November 1931 to November 1932, 450 second-feet June 17 (gage height, 3.25 feet); minimum, 1 second-foot Aug. 28 (gage height, 0.40 foot).

1912, 1915-17, 1931-32: Maximum discharge, 1,160 second-feet June 10, 1915 (gage height, 7.6 feet); no flow Aug. 20 to Sept. 16, 1916.

REMARKS.—Records good except those for period of ice effect, Nov. 1 to Mar. 25, which are based on three discharge measurements and temperature records. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1				20	18	13	28	65	4	1	3	22
2					18	13	40	60	3	2	4	22
3					18	14	33	33	3	2	4	19
4					18	53	26	33	5	2	6	19
5					19	77	36	24	5	2	6	17
6				12	19	76	22	17	5	2	6	14
7					19	46	40	11	5	2	7	14
8					19	26	40	17	4	2	8	14
9					19	26	30	22	5	2	9	14
10			* 20		21	39	314	26	5	2	9	16
11				15	23	99	340	21	5	2	9	19
12					23	136	130	18	4	6	9	19
13					22	180	240	15	5	6	11	17
14					21	182	147	13	5	6	11	15
15			* 12		20	142	261	13	4	6	11	15
16				18	22	65	340	12	3	5	11	14
17					33	21	384	10	3	5	11	14
18		* 3			36	16	265	9	3	5	11	15
19					21	10	102	8	3	4	11	18
20					19	60	69	6	3	4	11	15
21				45	17	71	63	4	3	3	12	15
22					16	172	62	2	3	3	14	17
23					8	52	97	2	3	3	15	19
24					6	19	94	2	3	3	19	23
25					7	5	89	3	3	3	19	27
26				15	3	18	85	4	3	3	19	27
27				17	3	17	99	5	3	3	19	27
28				17	4	20	95	7	1	3	21	27
29				17	5	16	80	7	1	3	22	27
30				17	7	82	69	7	1	3	22	27
31				17		24		7	1		22	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
November			4	238
December			13	799
January			15	922
February			25	1,440
March			21.0	1,290
April	36	3	16.8	1,000
May	182	5	57.7	3,550
June	384	22	124	7,380
July	65	2	15.6	959
August	5	1	3.4	209
September	6	1	3.3	196
The period				18,000
1932				
October	22	3	12.0	738
November	27	14	18.8	1,120

## 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 to September 1932.

EXTREMES.—Maximum discharge during year, 176 second-feet Feb. 26 (gage height, 3.14 feet); no flow Sept. 23.

REMARKS.—Records good except those estimated, Mar. 6-21, and those of discharge above 20 second-feet, which are poor. Diversions for irrigation above station.

*Discharge, in second-feet, 1932*

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		127	19	1	0.8	3	0.5	0.2
2		97	24	.7	2	5	.4	.2
3		70	32	.5	1	5	.4	.2
4		30	32	4	1	3	.3	.2
5		20	23	4	1	2	.3	.2
6			22	4	2	2	.3	.2
7			18	1	3	1	.3	.2
8		10	15	.2	3	2	.3	.2
9			16	.3	4	.5	.3	.2
10			13	.3	57	.5	.5	.2
11			13	.3	74	.4	.3	.2
12			6	24	30	.4	.2	.2
13		15	2	32	36	.2	.2	.2
14			2	43	41	.4	.3	.2
15			1	34	61	.4	.3	.2
16			4	9	67	.4	.3	.2
17			2	3	46	.3	.2	.2
18		18	6	2	19	.4	.4	.2
19			3	3	6	.6	.3	.2
20			1	6	4	.2	.3	.2
21		20	1	13	4	.6	.2	.2
22		27	1	53	4	.6	.2	.3
23		25	1	6	5	.8	.2	.1
24		20	1	3	5	.8	.2	.3
25		20	1	3	9	1	.2	.3
26		165	22	1	3	.9	.2	.1
27		141	19	1	3	.9	.2	.2
28		152	19	1	2	.7	.2	.1
29		140	19	2	2	.8	.2	.1
30			17	1	2	.3	.2	.3
31			17		1	.5	.2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February 26-29	165	140	150	1, 190
March	127		25.3	1, 560
April	32	1	8.8	524
May	53	.2	8.49	522
June	74	.8	17.7	1, 050
July	5	.2	1.15	71
August	.5	.2	.28	17
September	.3	.1	.20	12
The period				4, 950

## NORTH FORK OF OWL CREEK NEAR THERMOPOLIS, WYO.

LOCATION.—Chain gage in sec. 34, T. 44 N., R. 98 W., 25 miles northwest of Thermopolis and 1 mile above junction with South Fork.

DRAINAGE AREA.—100 square miles.

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

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 505 second-feet June 13 (gage height, 4.00 feet); no flow during long periods. 1930-32: Maximum discharge, 3,380 second-feet Aug. 15, 1930 (gage height, 8.65 feet).

REMARKS.—Records fair except those of discharge above 100 second-feet, which are poor. Several small diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Nov.	Feb.	Mar.	Apr.	May	June	July
1	2	0		8	.1	42	13
2	2	0		8	.9	33	9
3	2	0	8	10	1	30	5
4	2	0		6	25	39	5
5	2	0		6	24	43	5
6	1	0		6	12	33	3
7	1	0		2	11	38	4
8	.8	0	3	3	17	62	5
9	0	0		6	20	62	0
10	0	0		3	34	238	0
11	0	0		4	48	121	0
12	0	0		8	50	130	0
13	0	0	3	6	61	278	0
14	0	0		6	79	126	0
15	0	0		5	54	111	0
16	0	0		7	32	104	0
17	0	0		7	56	89	0
18	0	0	7	4	60	86	0
19	0	0		1	45	83	0
20	0	0	12	.8	53	73	0
21	0	0	19	.5	59	69	0
22	0	0	16	.8	54	64	0
23	0	0	8	.5	23	59	0
24	0	0	6	.5	10	54	0
25	0	0	10	.3	6	50	0
26	0		10	.4	11	51	0
27	0		7	.2	11	128	0
28	0	10	11	.4	13	22	0
29	0		10	.5	46	20	0
30	0		3	.5	77	18	0
31			5		45		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	2	0	.43	26
February		0	1.4	81
March	16		6.6	406
April	10	.2	3.71	221
May	79	.1	33.5	2,060
June	278	18	78.5	4,670
July	13	0	1.6	98
The year	278	0	10.4	3,360

NOTE.—No flow during months omitted and during October and November 1932.

## 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 1903; July 1920 to September 1932.

EXTREMES.—Maximum discharge during year, 3,940 second-feet June 22 (gage height, 6.69 feet); minimum occurred during winter.

1897, 1903, 1920–32: Maximum discharge, 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 good except those for period of ice effect, Nov. 22 to Apr. 19, which are based on two discharge measurements and temperature records. Diversions for irrigation above station. Discharge estimated May 28, 29, June 27 to July 3, July 23–28.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1	164	139				131	422	1,780	333	144
2	159	124				192	342	1,510	299	142
3	159	127			135	271	356	1,260	274	137
4	154	124				342	600	850	238	139
5	146	124				422	680	647	232	134
6	164	124				398	600	595	226	134
7	164	120				206	576	575	199	127
8	150	124			100	322	556	585	188	127
9	154	120				414	706	575	188	125
10	154	91				693	797	565	179	134
11	154	102				1,070	930	683	199	120
12	143	85	* 71			1,630	960	695	179	120
13	135	110			110	1,800	1,360	605	184	122
14	131	120				1,750	1,850	575	184	118
15	116	105				1,700	2,310	476	175	116
16	116	116		* 51		1,140	1,960	450	179	120
17	113	76				1,220	1,720	450	175	120
18	131	102			130	1,440	1,590	467	153	118
19	127	91				1,490	1,700	575	139	118
20	124	102			135	2,060	1,530	458	137	120
21	127	74			131	2,350	1,760	405	142	127
22	124				120	1,560	2,270	382	142	127
23	127	80			102	758	2,380	347	137	125
24	131				99	576	3,170	412	139	127
25	150				99	518	2,680	382	139	116
26	159				99	446	2,680	361	144	114
27	139				86	398	2,680	319	157	110
28	139	85			99	370	2,290	319	166	110
29	146				96	611	2,180	305	162	102
30	127				390	668	2,000	312	162	104
31	143					454		326	162	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	164	113	141	8,670
November	139	74	102	6,070
December			75	4,610
January			70	4,300
February			75	4,310
March			90	5,530
April	390	86	123	7,320
May	2,350	131	886	54,500
June	3,170	342	1,520	90,400
July	1,780	305	589	36,200
August	333	137	184	11,300
September	144	102	123	7,320
The year	3,170		332	241,000

\* Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 2,850 second-feet May 22 (gage height, 5.8 feet); no flow July 23 (gage height, 0.93 foot).

1930-32: Maximum discharge, 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. No records Nov. 8 to Mar. 19. Numerous diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1	37			254	64	24	1,210	5	15
2.....	1	40			262	94	15	805	3	4
3.....	2	36			198	77	15	492	6	8
4.....	2	34			166	68	4	405	5	1
5.....	1	35			145	82	510	318	1	3
6.....	3	37			131	858	147	238	1	3
7.....	92	30			112	1,740	175	256	6	3
8.....	171				86	300	938	218	22	5
9.....	98				69	635	1,260	175	12	2
10.....	52				77	1,430	812	92	5	3
11.....	11				88	1,090	740	4	3	154
12.....	9		85		83	1,380	1,010	82	14	26
13.....	6				79	1,600	1,370	28	4	7
14.....	6				77	1,660	1,480	5	1	1
15.....	6				88	590	2,020	7	6	.8
16.....	7				96	221	2,440	2	1	1
17.....	11				101	120	1,960	1	12	1
18.....	57				143	202	1,420	15	1	.8
19.....	32				106	422	1,130	21	1	.8
20.....	17			415	100	609	914	4	1	1
21.....	14			415	106	1,340	858	.8	13	28
22.....	22			395	126	2,340	1,380	2	26	7
23.....	57			355	110	1,040	2,110	.6	38	2
24.....	92			345	153	327	2,390	1	9	2
25.....	75			335	113	221	2,620	32	11	1
26.....	60			306	76	138	2,270	6	8	2
27.....	45			297	59	20	1,540	32	15	1
28.....	36			284	72	4	2,000	24	12	.8
29.....	35			266	120	2	1,970	6	22	1
30.....	34			258	86	9	1,300	7	178	1
31.....	35			238		104		2	12	
Month	Maximum				Minimum		Mean		Run-off in acre-feet	
October.....	171				1		35.2		2,160	
November 1-7.....	40				30		35.6		494	
March 20-31.....	415				238		326		7,760	
April.....	262				59		116		6,900	
May.....	2,340				2		606		37,300	
June.....	2,620				4		1,230		73,200	
July.....	1,210				.6		145		8,920	
August.....	178				1		14.6		898	
September.....	154				.8		9.54		568	

• Result of discharge measurement.

## 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 November 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 744 second-feet June 25 (gage height, 3.1 feet); minimum, 29 second-feet Apr. 10 (gage height, 1.25 feet).

1910–12, 1915–17, 1930–32: Maximum discharge (estimated), 1,700 second-feet June 8, 1912; minimum, 27 second-feet Mar. 26, 29, 1931.

REMARKS.—Records fair except those for periods of ice effect, Nov. 26 to Feb. 29, Mar. 6 to 25, which are based on two discharge measurements and temperature records. Diversions for irrigation above station.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1.	79	57			61	57	40	264	448	95	71	37	57
2.	76	57			55	62	48	221	456	106	68	39	58
3.	68	60			54	65	81	200	440	110	67	38	58
4.	64	57			61	61	60	239	340	93	67	38	60
5.	65	53			50	52	197	267	309	110	68	39	64
6.	84	62				48	200	302	302	116	65	36	61
7.	81	53				42	114	278	260	110	64	36	64
8.	73	62			40	52	165	267	224	93	67	39	57
9.	70	65				30	191	362	248	88	68	43	57
10.	60	61				29	230	382	248	91	71	40	52
11.	55	55	42			32	298	400	257	89	68	42	57
12.	55	48				47	396	379	254	93	65	44	62
13.	52	50			40	46	496	492	254	98	61	55	62
14.	62	58				49	464	632	260	91	64	61	70
15.	57	52		36		49	281	604	206	104	61	61	60
16.	58	48				49	239	584	203	112	62	61	52
17.	54	50				57	224	584	200	108	61	55	58
18.	50	58			45	54	221	516	206	86	62	50	57
19.	54	53				50	316	464	233	82	65	73	62
20.	53	57				47	424	444	167	76	64	76	58
21.	44	58				58	500	456	120	74	70	67	55
22.	54	40				62	492	552	149	76	64	76	58
23.	64	36			50	54	344	654	149	65	57	73	54
24.	52	40				48	323	645	116	70	37	60	46
25.	61	40				54	245	694	108	71	37	58	49
26.	67				48	57	248	676	98	71	44	64	54
27.	64				46	40	173	699	104	79	40	58	49
28.	54				44	43	142	532	110	74	39	61	53
29.	58	45			52	39	227	582	104	71	38	57	52
30.	62				58	41	264	496	86	65	40	57	50
31.	60				54		286		91	70		60	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931–32				
October	84	44	61.6	3,790
November	65	36	51.8	3,080
December			45	2,770
January			40	2,460
February			45	2,590
March	61		47	2,890
April	65	29	49.1	2,920
May	500	40	254	15,600
June	699	200	461	27,400
July	456	86	218	13,400
August	116	65	88.3	5,400
September	71	37	59.2	3,520
The year	699		118	85,800
1932				
October	76	36	53.4	3,280
November	70	46	56.9	3,390

\* Result of discharge measurements.

## BENCH CANAL NEAR BURLINGTON, WYO.

LOCATION.—Staff gage in sec. 8, T. 51 N., R. 97 W., 200 yard- below head gate and 7 miles southwest of Burlington. Prior to May 24, 1931, staff gage at site 2 miles downstream (revised) was used.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 229 second-feet July 8 (gage height, 1.66 feet); no flow during winter.

1930-32: Maximum discharge, that of July 8, 1932.

REMARKS.—Records fair. Discharge estimated Sept. 1-30. 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, 1931-32*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		9	209	160	48	30	16		30	73	146	22	20
2		9	192	176	46	26	17		30	75	148	21	19
3		3	179	176	35	28	18	3	68	103	120	37	19
4		3	174	132	35	21	19	18	103	104	148	22	19
5		3	164	176	25	21	20	24	132	100	120	10	19
6		8	160	205	21	21	21	24	149	148	120	21	65
7		8	89	221	21	21	22	14	148	100	118	21	54
8		3	1	224	21	21	23	16	192	101	106	21	45
9		3	1	222	21	21	24	14	208	208	92	21	22
10		3	2	176	21	30	25	17	221	176	106	21	22
11		3	13	174	21	60	26	27	209	92	73	21	20
12		10	21	176	22	44	27	14	221	92	73	21	20
13		10	37	176	21	32	28	7	221	106	73	21	18
14		26	48	174	22	25	29	1	206	118	73	21	18
15		16	49	162	21	21	30	1	222	131	75	49	18
							31		208		78	48	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 18-30	27	1	13.8	356
May	222	3	86.6	5,320
June	209	1	108	6,430
July	224	73	142	8,730
August	49	10	25.8	1,590
September	65	18	27.3	1,620
The year	-----	-----	-----	24,000

NOTE.—No flow during months omitted.



## SHOSHONE RIVER BELOW SHOSHONE RESERVOIR, WYO.

LOCATION.—Water-stage recorder in lot 76, T. 52 N., R. 102 W., about 4½ miles west of Cody.

DRAINAGE AREA.—1,470 square miles.

RECORDS AVAILABLE.—January 1921 to September 1932.

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, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	203	107	203	254	181	233	240	459	2,480	9,250	1,790	2,600
2.....	166	107	223	243	181	233	240	459	2,350	8,590	1,730	3,110
3.....	121	107	247	223	181	233	240	495	2,220	7,760	1,770	3,060
4.....	116	107	269	223	181	233	240	526	2,260	6,660	1,630	3,000
5.....	107	107	292	216	181	233	240	542	2,670	5,550	1,590	2,990
6.....	112	109	296	219	181	233	240	558	3,050	4,820	1,520	2,990
7.....	112	109	303	219	181	233	243	564	3,130	4,540	1,460	2,990
8.....	121	105	307	216	184	233	273	586	3,190	4,360	1,410	1,940
9.....	126	109	315	223	184	233	280	655	3,180	4,290	1,390	1,710
10.....	121	109	319	226	187	233	280	728	3,160	4,180	1,750	2,180
11.....	116	109	311	226	178	236	288	858	3,280	4,080	2,340	2,820
12.....	121	109	319	223	190	236	273	920	3,310	4,120	2,240	2,820
13.....	121	109	323	212	184	236	250	1,100	3,520	4,060	2,170	2,820
14.....	105	109	332	212	184	236	250	1,290	4,180	4,040	2,100	2,810
15.....	105	107	332	212	184	236	307	1,460	5,310	3,690	2,030	2,800
16.....	105	107	296	212	184	236	370	1,570	6,550	3,380	1,970	2,790
17.....	105	107	296	212	184	236	454	1,620	7,030	3,110	1,910	2,780
18.....	100	107	300	212	184	236	532	1,730	7,050	2,940	1,550	2,750
19.....	102	107	303	212	184	236	648	1,890	7,070	2,980	1,320	2,770
20.....	100	107	296	212	184	236	532	2,070	6,680	2,880	1,450	2,750
21.....	98	107	292	203	184	236	537	2,380	6,750	2,650	1,510	2,730
22.....	98	100	280	247	184	236	526	3,670	7,600	2,430	1,640	2,170
23.....	98	121	280	181	184	236	521	4,080	9,410	2,240	1,720	1,220
24.....	100	121	284	181	184	236	521	3,750	11,200	2,150	1,670	1,320
25.....	96	131	284	181	184	236	521	3,310	12,300	2,070	1,620	1,220
26.....	98	121	273	181	184	236	526	3,000	12,500	2,000	1,660	1,230
27.....	98	121	273	181	184	236	505	2,680	12,200	1,960	1,760	1,230
28.....	98	121	276	181	184	236	464	2,440	11,400	1,920	1,720	1,240
29.....	98	118	280	181	200	236	459	2,430	10,500	1,900	1,720	798
30.....	98	155	262	181	-----	236	459	2,620	9,930	1,860	1,710	273
31.....	105	-----	254	181	-----	236	-----	2,630	-----	1,820	1,620	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	203	96	112	6,890
November.....	155	100	112	6,660
December.....	332	203	288	17,700
January.....	254	181	209	12,900
February.....	200	178	184	10,600
March.....	236	233	235	14,400
April.....	648	240	382	22,700
May.....	4,080	459	1,710	105,000
June.....	12,500	2,220	6,180	368,000
July.....	9,250	1,820	3,820	235,000
August.....	2,340	1,320	1,720	106,000
September.....	3,110	273	2,260	134,000
The year.....	12,500	96	1,430	1,040,000

## SHOSHONE RIVER AT BYRON, WYO.

LOCATION.—Water-stage recorder in sec. 34, T. 56 N., R. 97 W., at Byron. Prior to Apr. 24, 1932 chain gage 450 feet upstream at same datum was used.

DRAINAGE AREA.—2,300 square miles.

RECORDS AVAILABLE.—January 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 13,900 second-feet June 25 (gage height, 6.45 feet); minimum, 29 second-feet Feb. 14, from discharge measurement.

1929-32: Maximum discharge, 6,920 second-feet June 12, 1930 (gage height, 5.9 feet); minimum, that of Feb. 14, 1932.

REMARKS.—Records good except those for period of ice effect, Nov. 20 to Mar. 20, which are based on two discharge measurements and temperature records. Discharge estimated May 28, 29, June 27 to July 3, Jul- 23-28. Water diverted for irrigation above station. Flow regulated by Shoshone Reservoir.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	208	187					360	318	2,720	7,600	900	1,460
2.....	187	170					370	289	2,600	7,400	850	3,060
3.....	150	153	270	370	370	300	360	260	2,410	6,800	800	3,060
4.....	130	160					365	318	2,270	6,250	830	2,970
5.....	139	153					365	274	1,890	5,530	694	2,940
6.....	461	144					354	1,450	2,350	4,430	662	2,910
7.....	381	136					370	736	2,720	3,910	662	2,740
8.....	170	130	290	375	380	240	370	339	5,180	3,670	646	2,660
9.....	180	125					381	365	4,340	3,550	595	950
10.....	170	116		385			408	408	3,940	3,460	554	1,790
11.....	170	120					392	420	3,760	3,380	1,320	3,200
12.....	191	128			270		323	533	3,670	3,400	1,460	3,140
13.....	318	136	270	320		380	308	590	3,580	3,350	1,270	3,140
14.....	216	144			29		246	708	4,030	3,320	1,240	3,030
15.....	216	160			100		199	902	5,240	3,000	1,150	3,030
16.....	199	173					173	890	6,150	2,550	1,120	3,030
17.....	195	166					216	910	6,690	2,210	1,090	2,940
18.....	183	160	340	370	300	470	251	900	6,620	1,920	920	2,860
19.....	183	153					318	890	6,350	2,130	609	2,860
20.....	176	140					403	970	5,950	1,940	623	2,830
21.....	163					467	208	1,110	5,820	1,740	791	3,200
22.....	166					443	238	2,580	6,120	1,480	800	2,660
23.....	176	150	370	380	390	431	204	3,200	7,100	1,290	790	1,040
24.....	166					408	485	2,800	8,420	1,210	780	1,040
25.....	176					381	381	2,240	9,860	1,180	760	1,210
26.....	163					360	298	1,890	10,900	1,020	850	1,240
27.....	157	180	400	370	450	376	360	1,540	9,800	930	1,920	1,160
28.....	163					386	328	1,480	8,500	890	1,040	1,140
29.....	176					386	386	1,760	8,300	880	1,190	1,110
30.....	173					376	461	2,050	8,050	860	1,350	489
31.....	166					354		2,410		950	1,190	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	461	130	196	12,100
November.....	187	116	153	9,100
December.....			326	20,000
January.....			365	22,400
February.....			343	19,700
March.....			365	22,400
April.....	485	173	329	19,600
May.....	3,200	260	1,150	70,700
June.....	10,900	1,890	5,510	238,000
July.....	7,600	860	2,980	183,000
August.....	1,460	554	918	56,400
September.....	3,200	487	2,300	137,000
The year.....	10,900	116	1,240	900,000

• Result of discharge measurement.

## 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 September 1932. March 1905 to June 1906 at Crow Agency, about 2 miles downstream. Crow Agency Ditch diverts water between two locations.

EXTREMES.—Maximum discharge during year, 2,090 second-feet Feb. 27 (gage height, 11.21 feet); minimum, 30 second-feet Feb. 3 (gage height, 4.82 feet).

1905-6, 1912-24, 1928-32: Maximum discharge, 8,200 second-feet July 23, 1923 (gage height, 14.0 feet); no flow July 28 to Aug. 6, 1921.

REMARKS.—Records good except those for period of ice effect, Nov. 26 to Feb. 28, Mar. 8-13, which were estimated. Several diversions above station. Some regulation by head-gate operations above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	122	107	122	47	1,120	276	623	865	420	69	84
2	82	122	107	102	40	743	285	713	773	393	68	91
3	83	126	105	89	30	343	285	713	743	420	64	70
4	84	126	114	74	32	281	285	623	713	393	66	73
5	86	126	110	74	49	166	285	563	743	393	68	70
6	164	126	102	88	54	153	252	773	865	393	65	59
7	201	122	92	91	83	119	231	1,260	865	320	61	62
8	204	122	92	91	89	108	210	803	1,120	297	59	57
9	169	129	91	97	124	107	198	683	930	289	57	65
10	153	133	94	97	122	102	198	743	803	242	60	73
11	131	129	92	102	119	102	201	1,190	803	220	56	74
12	135	126	99	102	108	103	194	1,320	773	201	56	77
13	129	126	108	102	89	110	188	1,390	773	177	53	64
14	136	126	117	95	77	120	194	1,390	773	153	55	89
15	131	122	94	61	80	127	207	1,460	773	126	64	86
16	129	122	114	47	66	234	201	1,460	743	115	64	89
17	124	122	164	42	47	272	198	1,260	743	99	60	77
18	119	122	159	42	61	563	204	930	743	80	57	74
19	112	122	210	42	83	803	204	930	713	69	51	59
20	115	122	220	61	105	1,060	210	1,260	683	80	47	59
21	115	102	234	102	112	743	201	1,390	683	95	41	57
22	122	104	220	86	119	773	201	1,740	623	89	44	60
23	119	105	201	102	119	653	224	1,880	942	86	45	65
24	119	108	188	95	289	533	343	1,120	1,260	66	44	70
25	119	105	177	102	533	503	995	1,060	1,120	71	42	73
26	122	112	194	102	1,190	343	563	995	865	71	45	84
27	126	102	183	95	1,320	320	476	995	865	71	47	88
28	129	99	188	86	1,460	272	368	930	743	69	49	84
29	136	103	194	80	1,600	256	476	930	533	66	83	114
30	122	100	183	71	-----	297	593	865	683	69	80	110
31	122	-----	172	54	-----	264	-----	865	-----	71	86	-----

Month	Maximum	Minimum	Mean	Pun-off in acre-feet
October	204	77	126	7,750
November	133	99	118	7,020
December	234	91	146	8,980
January	122	42	83.7	5,150
February	1,600	30	284	16,300
March	1,120	102	377	23,200
April	995	188	298	17,700
May	1,880	563	1,060	65,200
June	1,260	533	809	48,100
July	420	66	184	11,300
August	86	41	58.3	3,580
September	114	57	75.2	4,470
The year	1,880	30	301	219,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 4,820 second-feet May 23 (gage height, 6.28 feet); minimum, 34 second-feet Aug. 19–21 (gage height, 0.33 foot).

1928–32: Maximum discharge, 7,220 second-feet June 2, 1929 (gage height, 8.25 feet); minimum, 8 second-feet July 29, 1931 (gage height, 0.02 foot).

REMARKS.—Records good except those for period of ice effect, Nov. 21 to Mar. 23, which are based on two discharge measurements and temperature records. Diversions for irrigation above station.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	183	196				224	440	1,730	640	80	66
2	196	224				270	395	1,390	585	84	64
3	196	224			160	286	462	1,230	510	76	66
4	183	224				303	612	1,310	585	76	64
5	170	224				286	872	1,470	535	76	64
6	196	224				254	1,640	1,550	462	76	64
7	254	239				239	1,920	1,820	418	72	64
8	254	224			110	210	1,310	2,220	355	68	60
9	239	196				224	1,230	1,640	303	66	64
10	239	239				210	1,150	1,390	270	64	58
11	224	224				210	1,230	1,470	254	62	62
12	224	196				210	2,120	1,470	224	58	80
13	210	196			120	210	2,980	1,470	196	51	102
14	210	196				224	3,220	1,470	183	48	104
15	210	210				303	3,460	1,550	183	44	98
16	210	170				338	2,430	1,730	137	48	94
17	210	210				338	2,120	1,820	133	48	98
18	196	210			200	395	2,120	1,640	115	37	94
19	210	210		120		375	2,760	1,390	102	36	94
20	210	183				320	3,340	1,310	98	34	94
21	210					395	4,430	1,310	96	34	102
22	224				275	440	4,430	1,150	84	37	137
23	224	170				485	4,820	1,070	86	40	128
24	210					395	560	3,460	990	76	38
25	210		131			355	670	2,540	1,470	78	37
26	210					338	510	2,120	1,640	76	37
27	224					375	418	1,730	1,310	76	38
28	224	160				270	395	1,470	1,070	76	70
29	210					254	462	1,470	872	76	70
30	224					254	462	1,730	732	76	65
31	210					254		1,820		76	70

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	254	170	213	13,100
November	239		196	11,700
December			150	9,220
January			140	8,610
February			145	8,340
March	395		202	12,400
April	670	210	341	20,300
May	4,820	395	2,120	130,000
June	2,220	732	1,420	84,500
July	640	76	231	14,200
August	84	34	56.1	3,460
September	183	58	102	6,070
The year	4,820	34	444	322,000

\* Result of discharge measurements.

## TONGUE RIVER NEAR MILES CITY, MONT.

LOCATION.—Staff gage in NW¼ SW¼ 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 September 1932.

EXTREMES.—Maximum discharge during year, 3,980 second-feet May 24, 25 (gage height, 3.60 feet); no flow at times during July to September.

1929-32: Maximum discharge, 5,910 second-feet June 5, 1929 (gage height, 4.4 feet); no flow at times during July to September 1931 and 1932 (all water diverted into canal).

REMARKS.—Records fair. Stage-discharge relation affected by ice Nov. 25 to Feb. 29, Mar. 6-18. Numerous diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	85	217	120	115	70	2,260	486	390	1,670	896	0	120
2.....	95	199	120	115	95	1,960	486	390	1,580	880	18	80
3.....	115	199	120	110	100	770	474	390	1,480	785	0	0
4.....	115	183	120	110	110	462	357	390	1,390	680	0	0
5.....	127	183	120	100	134	462	335	438	1,220	538	0	0
6.....	115	183	120	95	120	438	291	510	1,480	450	0	0
7.....	127	183	120	100	110	390	313	680	1,580	402	0	0
8.....	127	183	120	105	105	390	313	1,130	2,460	390	0	0
9.....	115	183	120	100	120	390	313	1,670	2,160	390	0	0
10.....	141	183	110	100	134	346	280	1,300	1,670	324	0	0
11.....	183	183	100	110	120	390	262	1,060	1,480	280	0	0
12.....	217	190	100	100	110	450	262	1,130	1,480	244	0	0
13.....	199	199	100	90	100	510	244	1,480	1,390	226	0	0
14.....	155	199	100	80	100	510	244	1,860	1,300	190	0	0
15.....	155	217	100	80	95	650	244	2,460	1,300	148	0	0
16.....	169	217	105	80	95	800	217	2,660	1,300	134	0	0
17.....	183	199	105	85	110	896	199	2,870	1,480	100	0	0
18.....	183	169	105	90	115	1,060	217	2,260	1,670	90	0	0
19.....	199	169	110	100	134	1,130	217	2,060	1,670	70	0	0
20.....	199	155	127	95	155	1,960	244	2,160	1,670	1,660	0	0
21.....	199	141	134	90	190	1,300	280	2,260	1,390	566	0	0
22.....	199	141	134	85	190	1,300	1,860	3,080	1,300	148	0	0
23.....	217	141	134	85	280	1,130	402	3,980	1,220	62	0	0
24.....	199	141	120	90	510	800	1,660	3,980	1,130	38	0	0
25.....	199	134	115	95	770	650	650	3,980	1,220	18	0	0
26.....	217	120	120	100	1,860	596	594	3,520	960	6	0	0
27.....	217	120	127	90	1,040	510	510	2,260	1,300	0	0	0
28.....	217	120	134	85	650	486	566	1,580	2,060	0	710	0
29.....	199	120	148	75	2,560	486	622	1,670	1,860	0	566	0
30.....	199	110	127	70	-----	486	510	1,390	1,480	0	438	0
31.....	199	-----	120	80	-----	510	-----	1,670	-----	-----	148	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	217	85	170	10,500
November.....	217	110	169	10,100
December.....	148	100	118	7,260
January.....	115	70	93.7	5,760
February.....	2,560	70	355	20,400
March.....	2,260	346	790	48,600
April.....	1,860	199	455	27,100
May.....	3,980	390	1,830	118,000
June.....	2,460	960	1,510	89,800
July.....	1,660	0	313	19,200
August.....	710	0	60.6	3,730
September.....	120	0	6.7	399
The year.....	3,980	0	489	356,000

## 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 square miles.

RECORDS AVAILABLE.—September 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 1,640 second-feet May 22 (gage height, 4.64 feet); minimum probably occurred during winter.

1930-32: Maximum discharge, that of May 22, 1932; minimum occurred during winter.

REMARKS.—Records good except those for period of ice effect, Nov. 22 to Apr. 3, which are based on one discharge measurement and temperature records. 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, 1931-32

Day	Oct.	Nov.	Feb.	Apr.	May	June	July	Aug.	Sept.
1	16	32	-----	17	35	330	195	30	12
2	14	32	-----	18	71	272	152	29	11
3	14	32	-----	19	128	245	132	28	12
4	14	30	-----	15	158	260	124	33	11
5	14	29	-----	14	177	465	96	35	10
6	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	17	29	-----	13	192	677	79	34	9
8	18	28	-----	12	186	779	79	35	11
9	18	28	-----	13	195	470	67	34	10
10	20	29	-----	12	208	310	60	32	10
11	26	18	-----	9	251	275	55	32	16
12	-----	-----	-----	-----	-----	-----	-----	-----	-----
13	24	25	-----	14	346	330	52	31	14
14	21	12	-----	22	588	310	61	30	12
15	22	28	-----	41	785	326	80	29	12
16	36	25	-----	53	850	517	80	27	11
17	35	24	-----	58	713	689	55	27	11
18	-----	-----	-----	-----	-----	-----	-----	-----	-----
19	35	22	-----	54	578	824	33	30	10
20	33	14	-----	64	517	737	31	30	10
21	32	21	-----	50	572	490	30	27	10
22	31	16	" 6	39	804	430	39	26	9
23	31	18	-----	60	1,230	440	39	21	10
24	-----	-----	-----	-----	-----	-----	-----	-----	-----
25	37	12	-----	79	1,420	490	37	20	13
26	36	-----	-----	83	1,530	522	36	19	13
27	36	-----	-----	72	1,390	512	37	12	13
28	33	10	-----	50	743	512	35	9	14
29	30	-----	-----	59	490	743	35	8	16
30	-----	-----	-----	-----	-----	-----	-----	-----	-----
31	34	-----	-----	50	425	572	33	9	16
32	25	-----	-----	48	350	405	31	14	15
33	35	10	-----	40	314	346	32	14	16
34	32	-----	-----	34	334	257	34	13	15
35	24	-----	-----	29	480	205	32	14	14
36	30	-----	-----	-----	522	-----	31	13	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	37	14	26.5	1,630
November	32	-----	19.8	1,180
December	-----	-----	6	430
January	-----	-----	7	369
February	-----	-----	7	403
March	-----	-----	10	615
April	83	9	38.0	2,260
May	1,530	35	535	32,900
June	824	205	458	27,300
July	195	30	61.7	3,790
August	35	8	24.0	1,480
September	16	9	12.2	726
The year	1,530	-----	101	73,100

\* Result of discharge measurements.

## 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 1932; July 1915 to April 1919 just above mouth of Clear Creek, 16 miles downstream.

EXTREMES.—Maximum discharge during year, 7,230 second-feet May 7 (gage height, 5.90 feet); no flow July 24 to Sept. 30.

1919-32: Maximum discharge, determined by slope-area method, 72,000 second-feet (revised) Sept. 29, 1933 (gage height, 23.7 feet); no flow during parts of summers of 1919, 1921-23, 1931-32.

REMARKS.—Records fair except those for period of ice effect, Nov. 20 to Mar. 18, which are based on two discharge measurements and temperature records. Diversions from tributaries upstream.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July
1.....	56	93			2,480	200	410	1,100	852
2.....	47	96			1,490	350	330	1,180	736
3.....	42	99		60	1,250	310	290	1,010	681
4.....	39	102			1,140	370	888	571	615
5.....	35	99			714	280	420	2,190	420
6.....	40	99			310	280	1,280	1,860	290
7.....	49	96			250	270	4,930	1,980	160
8.....	55	99		80	200	210	3,680	3,260	99
9.....	53	104			150	210	2,350	2,190	92
10.....	52	107			100	210	912	1,380	93
11.....	56	109				190	725	2,140	91
12.....	60	109				190	900	2,540	125
13.....	60	110		65	200	170	1,070	2,050	135
14.....	61	107				170	2,660	864	107
15.....	60	125				158	1,780	571	100
16.....	63	120			600	220	2,080	480	92
17.....	68	122			1,300	360	2,080	420	80
18.....	69	115		75	1,870	400	1,600	390	60
19.....	68	115			1,920	380	984	400	40
20.....	68	100		83	876	450	948	530	20
21.....	72				530	410	1,150	604	15
22.....	75				470	550	1,700	420	10
23.....	78	90	52	200	400	350	1,490	310	5
24.....	81				350	703	1,600	240	0
25.....	78				350	1,220	1,630	190	0
26.....	76			1,000	250	1,250	1,580	3,970	0
27.....	79			2,000	250	1,360	1,380	500	0
28.....	82	75		3,730	290	659	924	300	0
29.....	84			3,410	270	230	2,210	460	0
30.....	83				300	350	1,920	1,250	0
31.....	83				260		1,180		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	84	35	63.6	3,910
November.....	125		98.4	5,860
December.....			60	3,690
January.....			55	3,380
February.....	3,730		433	24,900
March.....	2,480	100	625	38,400
April.....	1,360	158	415	24,700
May.....	4,930	290	1,520	93,500
June.....	3,970	190	1,180	70,200
July.....	852	0	159	9,780
The year.....	4,930	0	383	278,000

° Result of discharge measurement.

NOTE.—No flow during months omitted.

## POWDER RIVER AT MOORHEAD, MONT.

LOCATION.—Water-stage recorder in sec. 18 (revised), T. 9 S., R. 48 E., at Moorhead.

RECORDS AVAILABLE.—May 1929 to September 1932.

EXTREMES—Maximum discharge during year, 3,100 second-feet June 8; maximum stage, 12.38 feet Feb. 28; no flow Aug. 6–11.

1929–32: Maximum discharge for period, 8,610 second-feet June 3, 1929 (gage height, 7.90 feet); no flow July 16–17, 1931, Aug. 6–11, 1932.

REMARKS.—Records fair. Discharge not computed Dec. 1 to Jan. 31. Some diversions for irrigation above station.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	158	148	114	870	371	610	1,380	1,030	* 6.2	9.2
2	112	155	116	814	355	604	1,250	880	6.8	12
3	110	155	116	652	360	604	1,270	818	* 3.9	17
4	100	166	120	485	355	638	1,130	833	1.0	17
5	99	158	122	446	360	659	1,040	792	* .5	18
6	106	155	122	441	355	652	1,430	702	0	19
7	116	155	110	430	340	130	1,980	* 416	0	11
8	120	155	112	430	324	1,980	2,740	129	0	14
9	122	158	124	446	305	1,680	2,130	86	0	13
10	122	145	127	446	300	1,470	1,680	86	0	19
11	118	145	127	441	296	1,270	1,510	86	0	20
12	114	145	118	430	291	1,240	1,510	53	* 1.2	24
13	114	145	120	425	282	1,350	1,540	* 48	2.5	28
14	118	145	122	419	273	1,610	1,660	* 43	2.5	33
15	116	145	118	408	256	1,820	1,310	* 39	56	32
16	116	145	118	458	252	1,880	1,140	35	17	32
17	118	145	120	474	265	1,780	1,090	* 32	8.6	32
18	118	138	120	688	305	1,720	1,060	30	9.2	29
19	122	131	127	880	334	1,610	990	* 27	8.0	27
20	124	127	134	972	350	1,570	934	* 24	4.5	22
21	127	120	136	752	345	1,860	916	* 21	* 3.5	28
22	127	120	150	652	366	1,980	853	* 18	* 2.5	27
23	122	120	150	584	403	2,130	835	* 15	1.5	25
24	124	118	153	545	458	2,210	801	13	1.5	27
25	124	116	171	515	590	2,050	810	* 11	* 5.0	25
26	127	106	277	480	712	1,840	1,420	8.6	8.6	24
27	131	100	533	452	760	1,580	1,720	* 7.1	8.6	25
28	131	100	680	441	787	1,350	1,270	5.6	9.8	27
29	134	104	1,070	419	688	1,180	1,070	5.6	11	28
30	140	108	392	631	1,230	1,020	5.6	14	30	30
31	145	381	1,610	381	1,610	1,610	5.6	11	11	---

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	158	99	122	7,500
November	166	100	136	8,090
February	1,070	110	197	11,300
March	972	381	538	33,100
April	787	252	402	23,900
May	2,210	604	1,450	89,200
June	2,740	801	1,320	78,600
July	1,030	5.6	204	12,500
August	56	0	66.1	406
September	33	9.2	23.1	1,370

\* Interpolated.



## 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 September 1932.

EXTREMES.—Maximum discharge during year, 6,290 second-feet June 9 (gage height, 5.86 feet); no flow at various times in August and September.

1928-31: Maximum discharge, 14,700 second-feet Mar. 12, 1929 (gage height, 8.9 feet); no flow at various times in August and September 1932.

REMARKS.—Records fair. Stage-discharge relation affected by ice in Nov. 21 to Dec. 31. Discharge not determined Jan. 1 to Mar. 22. Discharge estimated Oct. 1 to 5. Some diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	130	80		460	980	2,190	<sup>a</sup> 1,140	88	44
2		128	<sup>a</sup> 73		522	780	1,790	1,180	44	<sup>a</sup> 24
3		125	66		490	740	1,420	825	33	4.4
4		125	66		460	<sup>a</sup> 950	<sup>a</sup> 1,170	<sup>a</sup> 932	24	2.0
5		122	71		490	1,160	925	1,040	14	.4
6		103	125	<sup>a</sup> 68	460	1,420	980	<sup>a</sup> 781	12	.8
7		109	132	66	522	825	5,400	522	<sup>a</sup> 6.9	<sup>a</sup> 1.2
8		122	136	55	430	1,340	5,120	460	1.8	1.6
9		109	142	55	430	5,400	6,290	<sup>a</sup> 405	1.8	<sup>a</sup> .8
10		106	146	<sup>a</sup> 50	430	2,710	3,050	350	.4	0
11		103	160	44	430	1,510	<sup>a</sup> 2,520	310	.4	0
12		<sup>a</sup> 106	168	41	402	<sup>a</sup> 1,380	1,990	262	<sup>a</sup> .3	0
13		109	168	44	402	1,260	2,190	223	<sup>a</sup> .2	0
14		106	168	44	375	<sup>a</sup> 1,930	1,600	<sup>a</sup> 232	<sup>a</sup> .1	0
15		103	176	48	<sup>a</sup> 388	2,600	<sup>a</sup> 1,510	242	0	0
16		106	180	55	402	<sup>a</sup> 2,940	1,420	<sup>a</sup> 266	490	<sup>a</sup> 0
17		<sup>a</sup> 108	150	66	375	3,290	1,340	291	1.2	0
18		109	119	88	350	3,290	1,340	<sup>a</sup> 262	<sup>a</sup> 6.3	0
19		109	<sup>a</sup> 111	80	350	2,710	1,260	<sup>a</sup> 234	<sup>a</sup> 25	0
20		106	<sup>a</sup> 103	80	430	<sup>a</sup> 2,300	1,040	205	187	0
21		106	96	82	402	1,890	<sup>a</sup> 1,020	178	26	<sup>a</sup> 0
22		115	88	77	430	2,940	<sup>a</sup> 1,000	<sup>a</sup> 178	16	<sup>a</sup> 0
23		122	93	71	825	<sup>a</sup> 1,600	<sup>a</sup> 3,060	980	178	0
24		115	90	71	825	3,800	<sup>a</sup> 3,170	<sup>a</sup> 952	144	<sup>a</sup> 5.7
25		<sup>a</sup> 114	93	71	825	4,580	3,290	925	<sup>a</sup> 132	.6
26		112	90	71	740	2,290	<sup>a</sup> 2,790	2,090	121	<sup>a</sup> 3.7
27		115	80	77	662	2,190	<sup>a</sup> 2,290	4,320	<sup>a</sup> 102	6.8
28		132	82	71	590	1,600	1,790	4,320	<sup>a</sup> 82	325
29		125	82	66	590	1,420	<sup>a</sup> 1,450	2,500	62	140
30		132	81	62	460	1,180	1,110	1,110	<sup>a</sup> 37	325
31		131	55	<sup>a</sup> 460		1,110		12	182	6.8

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	132		103	6,330
November	180	80	123	7,320
December	88	41	65.0	4,000
March 23-31	825	460	664	11,900
April	4,580	350	936	55,700
May	5,400	740	2,080	128,000
June	6,290	925	2,130	127,000
July	1,180	12	367	22,600
August	490	0	67.0	4,120
September	44	0	2.89	172

<sup>a</sup> Interpolated.

## MIDDLE FORK OF POWDER RIVER AT KAYCEE, WYO.

LOCATION.—Chain gage in sec. 1, T. 43 N., R. 82 W., at Kaycee.

DRAINAGE AREA.—647 square miles.

RECORDS AVAILABLE.—May 1911 to October 1912; May 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 1,680 second-feet May 14 (gage height, 6.36 feet); minimum occurred during winter.

1911-12, 1929-32: Maximum discharge, that of May 14, 1932; minimum, 19 second-feet July 20, 1931.

REMARKS.—Records good except those for period of ice effect, Nov. 20 to Apr. 3, which are based on two discharge measurements and temperature records. Discharge estimated Oct. 4-8. Minor diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Apr.	May	June
1	48	67	-----	-----	150	122	254
2	44	74	-----	-----	140	125	232
3	43	78	-----	-----	130	134	215
4	47	74	-----	-----	122	208	203
5	51	73	-----	-----	108	432	195
6	55	74	-----	-----	108	731	195
7	59	73	-----	-----	102	321	282
8	64	75	-----	-----	99	308	244
9	69	73	-----	-----	103	328	192
10	67	71	-----	-----	96	590	199
11	67	69	-----	-----	102	815	297
12	67	67	-----	-----	98	1,100	188
13	67	63	-----	-----	108	1,250	176
14	67	65	-----	-----	125	1,370	159
15	67	71	-----	-----	119	1,260	146
16	67	73	-----	-----	166	737	137
17	67	59	-----	-----	164	674	385
18	67	55	-----	a 77	170	803	142
19	75	69	-----	-----	167	797	140
20	59	40	-----	-----	169	997	136
21	56		-----	-----	192	948	115
22	56		-----	-----	278	1,080	104
23	56		a 74	-----	330	728	92
24	56	55	-----	-----	177	497	86
25	64		-----	-----	127	402	84
26	69		-----	-----	146	352	80
27	68		-----	-----	134	312	106
28	65	70	-----	-----	142	286	136
29	65		-----	-----	134	286	100
30	68		-----	-----	108	286	86
31	70		-----	-----	-----	266	-----
Month	Maximum	Minimum	Mean		Run-off in acre-feet		
October	75	43	61.6		3,790		
November	78	-----	61.3		3,650		
December	-----	-----	50		3,070		
January	-----	-----	70		4,300		
February	-----	-----	110		6,330		
March	-----	-----	100		6,150		
April	330	96	144		8,570		
May	1,370	122	598		36,800		
June	385	80	170		10,100		
The period	-----	-----	-----		82,800		

a Result of discharge measurement.

## RED FORK NEAR BARNUM, WYO.

LOCATION.—Chain gage in sec. 34, T. 43 N., R. 83 W., 6 miles east of Barnum.

DRAINAGE AREA.—149 square miles.

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

EXTREMES.—Maximum discharge during period October to June, 768 second-feet May 14 (gage height, 3.63 feet); minimum occurred during winter.

1929-32: Maximum discharge, that of May 14, 1932; no flow July 12-23, 1931.

REMARKS.—Records fair except those for periods of ice effect, Nov. 13 to Feb. 29, Mar. 6-10, which were based on two discharge measurements and temperature records. Small diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1	16	27			25	36	51	82
2	16	25			25	41	55	78
3	18	29			24	50	87	73
4	16	28			22	54	164	68
5	20	30			20	47	424	68
6	20	29				41	225	71
7	26	25				42	154	76
8	16	26			17	41	161	92
9	16	24				39	213	76
10	21	29				35	316	81
11	26	28			16	38	439	65
12	27	27			15	38	556	63
13	26				17	50	466	60
14	26	25			22	90	659	52
15	24				30	94	367	47
16	26				34	55	184	44
17	22			*23	28	88	202	58
18	27	27			28	76	240	45
19	21				28	73	202	45
20	16				28	91	190	41
21	15				28	124	176	35
22	17				29	143	163	33
23	18	25	*12		30	115	163	31
24	16				30	76	127	28
25	19				32	59	127	18
26	19				34	51	115	19
27	19				33	52	115	37
28	17	20			34	57	104	33
29	29				34	46	95	29
30	29				35	51	88	19
31	29				34		86	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	29	15	21.1	1,300
November	30		25.4	1,510
December			17	1,050
January			15	922
February			25	1,440
March	35		25.8	1,590
April	143	35	63.1	3,750
May	659	51	217	13,300
June	92	18	52.2	3,110
The period				26,400

\* Result of discharge measurement.

## NORTH FORK OF POWDER RIVER NEAR KAYCEE, WYO.

LOCATION.—Chain gage in sec. 13, T. 44 N., R. 82 W., 5 miles north of Kaycee.

DRAINAGE AREA.—244 square miles.

RECORDS AVAILABLE.—May to November 1911; May 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 966 second-feet May 14 (gage height, 3.06 feet); minimum occurred during winter.

1911, 1929-32: Maximum discharge, that of May 14, 1932; no flow for several days in 1930 and 1931.

REMARKS.—Records good except those for period of ice effect Nov. 22 to Mar. 19, which were based on two discharge measurements and temperature records. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1	19	20				31	34	83
2	19	22				28	32	78
3	19	23			25	27	34	72
4	19	24				25	88	68
5	19	25				25	289	75
6	20	25				27	450	82
7	21	23				26	80	94
8	22	22			19	23	62	123
9	22	24				23	76	156
10	22	26				25	115	104
11	22	23				25	252	164
12	22	20				25	346	115
13	22	18			29	25	575	78
14	22	22				26	770	75
15	22	25				40	575	72
16	22	27				56	201	67
17	22	29			35	59	102	66
18	21	28		* 17		72	418	62
19	21	25				46	338	60
20	22	17			31	51	566	58
21	21	16			30	55	490	55
22	21	17			28	72	634	53
23	21				27	63	362	50
24	22		* 15		28	80	131	46
25	23				34	43	88	44
26	22	15			34	39	85	42
27	22				37	40	72	40
28	21				41	40	65	40
29	20				34	46	72	34
30	20				39	44	75	26
31	20				46		83	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	23	19	21.1	1,300
November	29		20.7	1,230
December			18	1,110
January			15	922
February			30	1,730
March	46		27.9	1,720
April	80	23	40.2	2,390
May	770	32	244	15,000
June	164	26	72.7	4,330
The period.				29,700

\* Result of discharge measurement.

CRAZY WOMAN CREEK NEAR BUFFALO, WYO.

LOCATION.—Chain gage in sec. 36, T. 48 N., R. 81 W., 21 miles southeast of Buffalo.

DRAINAGE AREA.—464 square miles.

RECORDS AVAILABLE.—June 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 831 second-feet June 1 (gage height, 3.04 feet); no flow Oct. 1-6.

1929-32: Maximum discharge, 2,640 second-feet June 2, 1929 (gage height, 5.36 feet); no flow during greater part of August, September, and Oct. 1-6, 1931.

REMARKS.—Records fair except those for period of ice effect, Nov. 18 to Feb. 26, which were estimated. Diversions for irrigation above station.

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	0	12	-----	-----	-----	23	2	467
2.....	0	10	-----	-----	-----	27	1	153
3.....	0	10	-----	12	150	29	9	133
4.....	0	12	-----	-----	-----	41	122	128
5.....	0	11	-----	-----	-----	44	153	136
6.....	0	10	-----	-----	-----	37	354	265
7.....	1	10	-----	-----	-----	31	136	310
8.....	2	12	-----	14	30	29	60	371
9.....	3	12	-----	-----	-----	25	90	197
10.....	4	10	-----	-----	-----	19	128	192
11.....	4	11	-----	-----	-----	17	179	206
12.....	5	12	-----	-----	-----	22	215	202
13.....	4	12	-----	12	40	29	270	179
14.....	3	13	-----	-----	-----	53	290	202
15.....	2	14	-----	-----	-----	150	290	210
16.....	3	14	-----	-----	-----	105	270	188
17.....	3	14	-----	-----	-----	92	160	202
18.....	2	-----	-----	16	60	62	150	188
19.....	2	-----	-----	-----	-----	41	143	163
20.....	3	-----	-----	-----	-----	32	360	133
21.....	3	10	-----	50	-----	29	270	114
22.....	4	-----	-----	75	-----	31	300	92
23.....	4	-----	-----	100	40	34	316	100
24.....	3	-----	11	200	-----	58	251	87
25.....	4	-----	-----	750	-----	56	192	80
26.....	6	-----	-----	800	-----	37	156	111
27.....	8	-----	-----	786	-----	21	156	122
28.....	9	12	-----	701	30	16	143	105
29.....	10	-----	-----	578	-----	10	122	90
30.....	10	-----	-----	-----	-----	5	210	58
31.....	11	-----	-----	-----	20	-----	197	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	11	0	3.6	221
November.....	14	10	11.3	672
December.....	-----	-----	12	738
January.....	-----	-----	11	676
February.....	-----	-----	149	8,570
March.....	-----	-----	57.1	3,510
April.....	150	5	40.2	2,390
May.....	360	1	184	11,300
June.....	467	58	173	10,300
The period.....	-----	-----	-----	38,400

\* Result of discharge measurement.

## 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, 4½ miles northeast of Williston.

RECORDS AVAILABLE.—June to September 1932.

EXTREMES.—Maximum discharge during period of records, 426 second-feet June 16 (gage height, 7.30 feet); minimum, 4 second-feet Aug. 2-9 (gage height, 2.26 feet).

REMARKS.—Records good.

*Discharge, in second-feet, 1932*

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1.....		61	5	6	16.....	206	8	5	6
2.....		44	4	6	17.....	133	8	5	6
3.....		32	4	6	18.....	99	8	6	6
4.....		29	4	6	19.....	84	9	6	6
5.....		21	4	6	20.....	50	8	6	6
6.....		17	4	6	21.....	34	8	6	6
7.....		15	4	6	22.....	32	8	6	6
8.....		15	4	6	23.....	27	8	6	6
9.....		15	4	6	24.....	22	8	6	6
10.....		16	5	6	25.....	17	8	6	7
11.....		14	5	6	26.....	16	7	6	7
12.....		14	5	6	27.....	34	6	6	7
13.....		12	5	6	28.....	41	6	7	7
14.....		10	5	6	29.....	25	5	7	8
15.....	41	8	5	6	30.....	61	5	6	8
					31.....		5	6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
June 15-30.....	206	16	57.6	1,830
July.....	61	5	14.1	867
August.....	7	4	5.3	326
September.....	8	6	6.3	375
The period.....				3,400

## LITTLE MISSOURI RIVER BASIN

## LITTLE MISSOURI RIVER NEAR ALZADA, MONT.

LOCATION.—Chain gage near southwest corner of T. 8 S., R. 60 E., 3 miles below mouth of Thompson Creek and 4 miles below Alzada.

DRAINAGE AREA.—780 square miles.

RECORDS AVAILABLE.—June 1911 to September 1925; August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 4,210 second-feet Apr. 24 (gage height, 14.9 feet); no flow at various times.

1911–25, 1928–32: Maximum discharge, 4,550 second-feet Apr. 6, 1912 (gage height, 15.3 feet); no flow at times.

REMARKS.—Records poor. Discharge estimated for period of ice effect, Jan. 28 to Feb. 22. Some small diversions. Small storage in coulees.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0.6	0.7	0.4	0.3	0.2	1,060	76	154	10	116	0.6	36
2.....	8.6	.6	.3	.4	.2	922	58	121	134	72	.5	11
3.....	7.8	.6	.3	.4	0	850	64	83	82	60	.5	4.4
4.....	3.8	.5	.3	.4	0	363	94	62	59	197	.4	8.6
5.....	1.3	.5	.3	.3	0	123	64	46	27	186	.4	8.6
6.....	.7	.5	.3	.3	0	82	47	38	456	106	.4	5.7
7.....	2.0	.5	.3	.3	0	72	35	33	262	74	.4	3.2
8.....	40	.2	.3	.3	0	60	26	27	94	35	.4	.6
9.....	39	.4	.3	.3	0	58	20	22	43	20	.4	.4
10.....	27	.4	.3	.3	0	51	16	20	29	13	.4	.4
11.....	17	.3	.3	.3	0	54	10	17	186	8.6	.3	.5
12.....	7.0	.3	.3	.4	0	47	7.0	15	102	7.0	.2	.4
13.....	4.5	.3	.3	.4	0	40	5.7	13	118	5.7	.3	.3
14.....	3.2	.2	.3	.5	0	39	3.8	14	88	3.8	28	.3
15.....	.7	.2	.2	.5	0	77	3.8	13	43	3.2	4.4	.2
16.....	.6	.2	.2	.4	0	221	4.5	14	22	2.6	32	.2
17.....	.6	.2	.2	.4	0	305	4.5	13	16	2.6	13.0	.1
18.....	.5	.2	.3	.4	0	424	4.5	10	12	1.3	7.0	.1
19.....	.5	.2	.3	.4	0	585	34	8.6	7	1.3	4.4	0
20.....	.4	.2	.4	.4	0	424	31	7.0	7.8	.6	2.0	0
21.....	13	.3	.3	.4	0	363	19	6.4	5.7	.5	.6	0
22.....	424	.2	.3	.4	0	221	7.0	7	.7	.6	.5	0
23.....	334	.4	.3	.4	.4	197	30	39	.7	.7	.4	0
24.....	164	.4	.3	.4	16	234	3,300	53	.6	.7	.4	0
25.....	82	.4	.3	.3	650	262	3,450	28	8.6	.7	.3	0
26.....	46	.4	.3	.3	1,000	186	2,540	96	738	5.1	.3	0
27.....	29	.4	.3	.3	1,280	363	1,060	65	1,310	.6	.4	0
28.....	19	.4	.3	.2	922	234	262	36	876	.5	.3	0
29.....	13	.4	.3	.2	946	127	363	26	456	.5	.3	0
30.....	5.7	.4	.4	.2	-----	93	320	16	164	.6	20	0
31.....	3.8	-----	.3	.2	-----	86	-----	10	-----	.6	22	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	424	0.4	41.9	2,580
November.....	.7	.2	.36	21
December.....	.4	.2	.30	18
January.....	.5	.2	.35	22
February.....	1,280	0	166	9,550
March.....	1,060	39	265	16,300
April.....	3,450	3.8	399	23,700
May.....	154	6.4	35.9	2,210
June.....	1,310	.6	178	10,600
July.....	197	.5	29.9	1,840
August.....	32	.2	4.56	280
September.....	36	0	2.70	161
The year.....	3,450	0	92.7	67,300

## 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 1932.

EXTREMES.—Maximum discharge during year, 12,500 second-feet Apr. 28 (gage height, 9.66 feet); minimum, 11 second-feet Sept. 25-30 (gage height, 1.64 feet).

1903-8, 1921-24, 1928-32: Maximum discharge, 38,700 second-feet June 7, 1929 (gage height, 17.2 feet); minimum, 2 second-feet Sept. 28, 1905 (gage height, 2.4 feet; old datum).

REMARKS.—Records fair. Discharge estimated for period of ice-effect, Nov. 21-30, Mar. 26. Discharge not computed Dec. 1 to Mar. 25. Small diversions for irrigation from headwater tributaries.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	155	152	-----	1, 220	3, 950	346	3, 290	76	62
2.....	150	142	-----	1, 220	2, 870	580	3, 140	62	404
3.....	120	113	-----	968	2, 340	708	1, 620	55	234
4.....	102	104	-----	852	1, 760	642	1, 250	47	165
5.....	98	96	-----	708	1, 480	1, 300	1, 400	43	120
6.....	86	90	-----	642	1, 130	• 1, 640	1, 060	39	97
7.....	77	82	-----	580	968	• 1, 980	735	39	84
8.....	72	75	-----	522	852	2, 330	483	39	70
9.....	65	• 66	-----	466	674	1, 400	283	39	62
10.....	65	56	-----	416	• 674	1, 250	182	37	57
11.....	63	60	-----	368	• 674	2, 460	133	35	45
12.....	63	57	-----	286	674	2, 590	89	35	37
13.....	63	51	-----	251	493	2, 590	379	33	32
14.....	60	51	-----	188	391	1, 400	283	39	29
15.....	60	48	-----	166	326	1, 200	229	• 222	24
16.....	57	38	-----	160	326	2, 090	192	404	23
17.....	57	38	-----	144	286	3, 740	175	193	20
18.....	54	35	-----	147	208	• 2, 000	108	456	16
19.....	50	35	-----	144	234	1, 250	162	234	14
20.....	44	35	-----	132	218	665	123	136	14
21.....	44	30	-----	120	203	483	102	97	14
22.....	44		-----	268	188	379	98	78	14
23.....	44		-----	286	188	306	98	55	14
24.....	44		-----	440	305	197	98	43	14
25.....	62		-----	1, 660	778	330	92	45	11
26.....	90		2, 250	2, 870	466	1, 200	• 84	97	11
27.....	78	-----	1, 760	10, 300	326	3, 440	77	84	11
28.....	234	-----	1, 390	12, 200	251	2, 090	69	67	11
29.....	268	-----	1, 760	10, 300	251	975	• 62	55	11
30.....	203	-----	1, 660	5, 650	234	538	56	62	11
31.....	174	-----	1, 300	-----	290	-----	56	62	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	268	44	91.8	5, 640
November.....	152	-----	57.5	3, 420
March 26-31.....	2, 250	1, 300	1, 690	20, 000
April.....	12, 200	120	1, 790	107, 000
May.....	3, 950	188	776	47, 700
June.....	3, 740	197	1, 400	83, 300
July.....	3, 290	56	524	32, 200
August.....	456	33	97.0	5, 960
September.....	404	11	57.7	3, 430

• Interpolated.



## 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 September 1932.

EXTREMES.—Maximum discharge during year, 1,450 second-feet June 14 (gage height, 11.80 feet); minimum, about 1.6 second-feet Nov. 24 (gage height, 1.68 feet).

1928-32: Maximum discharge, 3,070 second-feet Feb. 21, 1930 (gage height, 23.2 feet); minimum, 1.2 second-feet Aug. 27, 1929.

REMARKS.—Records good except those estimated for periods of ice-effect, Nov. 17 to Dec. 31, Mar. 1-27, which are fair. Discharge not computed Jan. 1 to Feb. 29. Discharge estimated Aug. 19, 20, Sept. 16-30. Some diversions above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	114	12	4.4	150	210	62	36	22	8.6	8.6
2.....	77	12	4.4		200	85	36	20	7.7	19
3.....	54	11	2.9		190	73	36	20	7.7	38
4.....	49	11	4.4		180	274	62	21	8.3	30
5.....	35	9	4.4	180	180	241	62	26	7.4	24
6.....	30	9	4.4	180	160	220	62	52	7.4	20
7.....	26	9	2.9	170	140	180	40	52	8.0	18
8.....	20	9	2.9	170	140	106	40	36	8.0	15
9.....	20	9	2.9	130	120	81	62	33	8.0	15
10.....	19	10	2.9	111	120	62	1,030	30	8.0	15
11.....	19	10	2.9	106	73	43	571	28	8.0	15
12.....	18	13	2.3	93	58	43	664	21	8.0	13
13.....	18	13	3.5	81	55	38	1,010	18	8.0	11
14.....	17	13	3.5	73	55	38	1,250	16	8.0	9.5
15.....	17	12	3.5	210	55	33	888	16	8.0	8.9
16.....	17	12	4.1	230	49	33	515	14	8.0	8.5
17.....	15	10	7.0	330	43	30	285	14	8.0	
18.....	14	6.2	8.6	392	43	30	130	13	8.0	
19.....	14	8.2	8.6	318	43	30	89	11	8.2	
20.....	16	8.2	10	473	43	23	69	11	8.4	8.0
21.....	15	4.4	10	405	38	23	66	11.0	8.6	
22.....	15	2.9	10	366	40	21	46	9.5	8.6	
23.....	15	2.9	12	230	696	21	40	9.5	8.3	
24.....	14	1.6	12	307	459	21	36	9.5	8.3	
25.....	14	2.0	12	274	342	21	36	9.5	8.3	
26.....	14	2.0	12	459	150	21	33	9.5	8.6	
27.....	14	2.0	13	379	98	19	33	9.5	8.6	
28.....	13	2.0	13	1,080	77	19	33	8.6	8.6	8.6
29.....	13	2.0	12	921	62	19	26	8.6	8.6	
30.....	12	3.5	9.5	435	62	19	24	8.6	8.6	
31.....	12		9.5	318		33		8.6	8.6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	114	12	24.5	1,510
November.....	13	1.6	7.73	460
December.....	13	2.3	6.95	427
March.....	1,080	73	291	17,960
April.....	696	38	139	8,270
May.....	274	19	63.3	3,890
June.....	1,250	24	244	14,500
July.....	52	8.6	18.6	1,140
August.....	8.6	7.4	8.17	502
September.....	38		128	762

## 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 September 1932.

EXTREMES.—Maximum discharge during year, 3,400 second-feet Feb. 28 (gage height, 11.55 feet); no flow Aug. 24 (gage height, 4.00 feet).

1924, 1928-32: Maximum discharge, that of Feb. 28, 1932: maximum gage height, 20.36 feet Mar. 18, 1930; no flow Aug. 20, 1929, Aug. 24, 1932.

REMARKS.—Records fair except those estimated, Nov. 22 to Dec. 31, Feb. 28 to Mar. 31, Sept. 8-30. Stage-discharge relation affected by ice Nov. 22 to Mar. 31. No records Jan. 1 to Feb. 26. No diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	137	20	15	2,250	618	98	43	76	8.4	2.8
2.....	157	20	*15	1,790	380	98	86	73	8.4	2.0
3.....	120	*20	*14	891	255	98	113	73	7.2	2.0
4.....	102	20	14	791	290	90	77	73	7.2	1.6
5.....	86	*20	13	703	244	89	72	71	6.0	1.6
6.....	64	*20	*13	504	222	89	70	72	6.6	1.2
7.....	53	20	13	327	164	89	62	70	6.6	1.2
8.....	49	*20	*13	314	182	89	57	64	5.6	
9.....	44	20	13	314	164	86	52	59	4.0	
10.....	44	20	*13	314	146	98	72	57	3.2	
11.....	40	20	13	302	130	90	51	53	2.4	1.0
12.....	38	*20	*12	244	121	90	1,240	53	*2.2	
13.....	36	20	11	212	113	86	618	41	2.0	
14.....	36	20	11	182	121	80	50*	37	4.8	
15.....	30	*20	12	164	98	72	937	35	5.6	
16.....	29	20	13	290	90	62	1,080	34	6.6	
17.....	25	*20	15	380	83	57	937	34	4.0	
18.....	25	*19	17	438	80	50	255	27	1.4	
19.....	24	18	18	438	*76	38	255	24	1.0	
20.....	24	18	19	470	72	25	244	22	.8	
21.....	22	18	19	470	64	18	255	21	.8	
22.....	29		19	470	83	16	79	19	.4	
23.....	22		*19	504	62	10	89	18	.4	1.5
24.....	27		*20	660	80	7.8	70*	18	.0	
25.....	25		*20	891	105	17	618	16	.8	
26.....	24		20	660	130	57	50*	17	2.0	
27.....	22		*20	578	138	36	380	16	2.0	
28.....	22		20	438	105	24	13*	14	2.8	
29.....	21		*20	380	105	20	12*	11	2.8	
30.....	21		19	327	98	16	8*	11	3.6	
31.....	20		19	327		47		9	3.6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	157	20	45.7	2,810
November.....	20		18.7	1,110
December.....	20	11	15.9	978
March.....	2,250	164	549	33,800
April.....	618	62	154	9,160
May.....	98	7.8	59.4	3,660
June.....	1,240	43	377	22,400
July.....	76	9.0	39.8	2,420
August.....	8.4	0	3.65	224
September.....	2.8		1.43	85

\* Interpolated.

## CANNONBALL RIVER BASIN .

## CANNONBALL RIVER NEAR TIMMER, N.DAK.

LOCATION.—Chain gage in NW¼ sec. 21, T. 133 N., R. 82 W., about 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 1932.

EXTREMES.—Maximum discharge during year, 8,600 second-feet June 10 (gage height, 12.66 feet); minimum, 0.3 second-foot Sept. 24 (gage height, 2.42 feet).

1903-8, 1911-18, 1921-24, 1928-32: Maximum discharge, that of June 10, 1932; maximum gage height, 12.7 feet Feb. 20, 1930; no flow at times during periods 1904-8, 1913, 1929, 1931.

REMARKS.—Records fair. No diversions. No records Nov. 22 to Feb. 29. Discharge estimated because of ice Mar. 1-28, 30.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	1.7		294	136	123	47	8.1	0.8
2	2.8	4.1		345	193	219	43	6.1	.8
3	2.2	4.1		277	136	88	42	5.4	2.4
4	1.5	3.4		219	107	70	328	4.4	1.7
5	1.5	3.4		206	100	54	262	3.7	6.8
6	1.5	4.1		181	88	68	146	2.8	4.4
7	1.5	4.8		169	125	1,780	136	2.8	2.8
8	1.1	4.8		158	125	1,690	88	2.6	1.9
9	1.1	5.4		125	125	572	530	2.1	1.3
10	1.0	4.8		117	113	6,390	206	1.9	1.1
11	.9	4.8	25	109	86	5,380	193	3.2	.8
12	1.1	4.8		98	80	1,220	193	3.4	.7
13	1.2	4.8		90	80	770	86	3.0	.9
14	2.1	4.8		82	74	1,220	44	2.4	.8
15	2.1	4.8		78	69	665	38	2.4	.7
16	2.1	4.8		72	63	434	32	1.9	.7
17	2.6	4.8		61	50	310	25	1.7	.7
18	2.1	4.8		72	45	247	23	1.5	.6
19	1.7	4.1		66	38	181	20	1.2	.5
20	1.2	4.1		61	34	146	76	1.2	.5
21	1.0	4.1		52	34	109	45	1.2	.5
22	3.7			47	32	103	24	1.2	.5
23	3.2		50	43	31	86	19	1.1	.5
24	3.7			39	31	193	16	1.0	.3
25	5.1			42	31	158	12	1.0	.4
26	6.5			46	136	121	9.7	1.0	1.0
27	4.4		200	42	78	96	8.1	.9	.8
28	2.8			46	43	68	12	.9	.8
29	1.5		362	398	40	80	11	.9	.6
30	1.2		328	530	36	56	10	.9	.6
31	1.1		294		59		9.7	.9	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6.5	0.9	2.20	135
November 1-21	5.4		4.35	181
March			75.3	4,630
April	530	39	139	8,270
May	193	31	78.0	4,800
June	6,390	54	757	45,000
July	530	8.1	88.2	5,420
August	8.1	.9	2.35	144
September	6.8	.3	1.23	73

## 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 1928 to September 1932; September 1911 to March 1918 at point 5 miles upstream.

EXTREMES.—Maximum discharge during year, 4,500 second-feet June 11 (gage height, 9.85 feet); no flow Nov. 29 to Feb. 20.

1911-18, 1928-32: Maximum discharge, 7,130 second-feet June 17, 19, 1915; no flow Sept. 13, 1929, Nov. 29, 1931, to Feb. 20, 1932.

REMARKS.—Records poor. Records of discharge for Nov. 21 to Mar. 28 were based on one discharge measurement and temperature records. No diversions or regulation.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sept.
1	56	22	0	2,710	568	2,430	377	328	30	12
2	42	18	0	2,620	465	1,410	1,220	269	33	9
3	34	15	0	1,800	385	1,590	1,290	263	42	13
4	30	12	0	900	365	1,410	970	269	26	24
5	27	10	0	600	353	870	1,000	275	24	22
6	24	8	0		320	640	540	263	23	21
7	20	8	0		282	550	350	230	24	23
8	17	7	0	300	218	496	480	260	25	25
9	15	8	0		185	532	1,420	317	22	24
10	14	8	0		164	582	2,410	272	22	22
11	11	7	0		154	441	4,240	230	22	20
12	10	6	0		137	429	3,930	192	19	16
13	10	6	0	250	114	345	2,060	157	17	14
14	9	5	0		105	218	1,630	126	16	12
15	8	5	0		93	171	1,330	107	14	10
16	8	5	0		84	154	1,000	93	14	10
17	8	6	0		78	132	720	80	13	12
18	8	6	0	550	74	111	780	68	12	12
19	8	6	0		76	93	560	61	11	10
20	8	6	0		72	84	360	32	10	8
21	8				68	82	320	32	21	7
22	9				65	78	317	35	24	5
23	10	4	100	750	63	72	310	33	14	4
24	11				64	70	420	32	11	3
25	26				109	84	420	30	10	3
26	46		1,200		224	192	413	29	9	4
27	29	2	2,200	2,000	168	145	286	27	9	4
28	15		2,800		239	152	300	25	8	4
29	20	0	3,000	2,020	560	215	720	24	23	4
30	20	0		925	1,130	210	519	22	23	4
31	24			680		625		21	16	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	56	8	18.9	1,160
November	22		6.7	399
February	3,000		334	19,200
March	2,710		887	54,500
April	1,130	63	233	13,900
May	2,430	70	471	29,000
June	4,240	286	1,020	60,700
July	328	21	136	8,360
August	42	8	18.9	1,160
September	25	3	12.0	714
The year	4,240	0	261	189,000

NOTE.—No flow during months omitted.

## 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 1932.

EXTREMES.—Maximum discharge during year, 5,600 second-feet June 12 (gage height, 11.4 feet); no flow Oct. 1 to Feb. 25, Aug. 10, 13-15.

1928-32: Maximum discharge, 13,400 second-feet Sept. 17, 1928 (gage height, 14.6 feet); no flow Oct. 1, 1931, to Feb. 25, 1932, and parts of summers of 1929-32.

REMARKS.—Records good except those for period Mar. 5-26, which were estimated because of ice. No diversions or regulation.

*Discharge, in second-feet, 1931-32*

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0	1,050	590	1,750	157	2,260	1	38
2.....	0	2,810	492	1,730	582	1,410	1	30
3.....	0	2,280	464	2,870	1,120	792	.9	26
4.....	0	1,700	590	1,110	1,540	506	.6	21
5.....	0	1,000	374	720	2,220	335	.5	16
6.....	0		344	565	1,080	275	.5	12
7.....	0		350	383	756	191	.4	10
8.....	0	200	350	302	1,120	164	.3	9
9.....	0		285	246	576	143	.1	7
10.....	0		236	215	484	113	0	6
11.....	0		191	218	3,210	145	.5	6
12.....	0		160	183	4,410	278	.1	6
13.....	0	150	129	147	2,370	189	0	5
14.....	0		111	109	1,340	125	0	3
15.....	0		88	81	984	85	0	3
16.....	0		70	62	586	58	282	2
17.....	0		58	50	780	42	1,030	2
18.....	0	350	49	42	2,370	33	4,330	2
19.....	0		48	32	736	24	2,320	1
20.....	0		46	29	460	20	994	.9
21.....	0		49	76	359	14	708	1
22.....	0		36	43	359	12	442	.9
23.....	0	450	125	25	268	10	236	.9
24.....	0		1,050	22	202	8	356	.8
25.....	0		716	77	160	6	371	.7
26.....	50	750	359	246	320	5	209	.6
27.....	200	854	206	172	422	4	312	.6
28.....	410	886	3,280	141	1,060	3	204	.6
29.....	596	984	2,740	236	2,640	2	139	.5
30.....		876	1,790	198	1,810	2	81	.5
31.....		700		180		2	49	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February.....	596	0	43.3	2,490
March.....	2,810		634	39,000
April.....	3,280	36	513	30,500
May.....	2,870	22	395	24,300
June.....	4,410	157	1,150	68,400
July.....	2,260	2	234	14,400
August.....	4,330	0	389	23,900
September.....	38	.5	7.1	422
The year.....	4,410	0	280	203,000

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 September 1932.

EXTREMES.—Maximum discharge during year, 4,240 second-feet Apr. 24 (gage height, 5.45 feet); minimum, 1 second-foot Aug. 2 (gage height, 1.38 feet).

1903-6, 1928-32: Maximum discharge, 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 Nov. 21 to Feb. 25 based on two discharge measurements and temperature records because of ice effect. Minor diversions above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	29			1,520	80	306	29	45	2	12
2	14	28			1,330	70	186	22	39	1	13
3	14	19		3	1,020	70	160	17	28	6	11
4	5	19			258	60	102	22	113	23	9
5	4	20			280	58	102	17	1,280	10	6
6	6	19				55	1,910	18	1,070	6	5
7	14	17				70	3,230	220	212	5	4
8	16	16		10	350	78	1,820	178	29	4	4
9	10	18				124	1,250	20	9	3	3
10	14	16				102	770	24	4	2	8
11	14	19				96	460	91	3	14	8
12	23	19				91	286	296	2	29	8
13	16	19		8	450	70	169	78	1,920	2,480	8
14	14	13				58	102	41	570	2,620	8
15	14	15			690	49	1,180	28	880	1,200	8
16	19	17			730	43	800	51	186	353	8
17	19	8			1,140	37	540	1,810	62	2,200	7
18	22	8		6	850	35	334	3,520	102	3,130	7
19	22	17			840	35	212	1,480	70	1,200	6
20	24	8			790	24	118	430	35	1,040	6
21	45				570	19	80	760	19	362	5
22	1,860				372	17	60	840	11	135	5
23	1,630	4		18	277	430	212	152	8	62	5
24	820				194	3,980	72	43	6	39	6
25	362				239	3,260	113	20	4	30	8
26	220			1,330	169	2,580	70	65	4	23	9
27	152			1,560	152	1,220	49	23	3	19	7
28	86	4		1,480	113	960	41	203	3	24	7
29	45			1,580	144	530	55	34	4	16	8
30	35		3.6		30	510	49	124	10	13	8
31	26				124		37		6	12	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,860	4	180	11,100
November	29		12.8	762
December				307
January			4	246
February	1,580		213	12,300
March	1,520	30	496	30,500
April	3,980	17	494	29,400
May	3,230	37	480	29,500
June	3,520	17	355	21,100
July	1,920	2	217	13,300
August	3,130	1	486	29,900
September	13	3	7.2	428
The year	3,980		246	179,000

• Result of discharge measurement.

## CHEYENNE RIVER NEAR WASTA, S.DAK.

LOCATION.—Chain gage in sec. 2, T. 1 N., R. 14 E., at highway bridge 3 miles east of Wasta. Zero of gage is 2,263.4 feet above mean sea level.

DRAINAGE AREA.—11,700 square miles.

RECORDS AVAILABLE.—July 1914 to June 1915; August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 46,300 second-feet May 6 (gage height, 11.28 feet); minimum, 33 second-feet Oct. 1 (gage height, 1.02 feet).

1914-15, 1928-32: Maximum discharge, that of May 6, 1932; minimum, 15 second-feet July 26, 27, 1931 (gage height, 0.92 foot).

REMARKS.—Records good except those for period of ice effect, Nov. 26 to Mar. 22, which were based on one discharge measurement and temperature records, and those for June, which are poor. Minor diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June
1	35	174	-----	2,500	650	958	394
2	41	146	-----		631	828	307
3	38	133	* 50		542	670	267
4	40	106	-----		464	670	228
5	40	130	-----		412	650	200
6	40	130	-----	800	394	14,600	159
7	41	123	-----		366	5,390	2,300
8	43	120	-----		350	5,250	361
9	43	120	-----		326	3,770	345
10	55	113	-----		312	2,480	1,270
11	46	120	-----	600	307	1,760	424
12	50	125	-----		316	773	934
13	53	128	-----		321	982	486
14	59	125	-----		293	806	250
15	80	125	-----		302	740	180
16	72	123	-----	1,000	302	922	196
17	70	123	-----		271	534	183
18	76	116	-----		271	751	146
19	70	118	-----		321	622	3,390
20	72	133	-----		1,600	254	577
21	78	111	-----	2,000	217	534	1,040
22	76	91	-----	2,300	200	431	450
23	72	91	-----	2,600	262	378	276
24	345	95	-----	2,070	5,450	438	312
25	922	95	-----	1,710	7,240	502	247
26	604	100	-----	1,250	5,590	534	2,580
27	874		-----	1,100	4,190	510	400
28	1,160		-----	1,050	3,280	438	254
29	438		-----	970	2,480	394	133
30	156		-----	730	1,560	372	125
31	180	-----	-----	650	-----	1,300	-----
Month	Maximum	Minimum	Mean		Run-off in acre-feet		
October	1,160	35	193		11,900		
November	174	-----	117		6,960		
December	-----	-----	110		6,760		
January	-----	-----	100		6,150		
February	-----	-----	150		8,630		
March	2,600	-----	1,340		82,400		
April	7,240	200	1,260		75,000		
May	14,600	372	1,600		98,400		
June	3,390	125	683		40,600		
The period	-----	-----	-----		337,000		

\* Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 32,400 second-feet May 7 (gage height, 10.2 feet); minimum probably occurred during winter.

1928-32: Maximum discharge, 49,600 second-feet June 3, 6, 1929 (gage height, 10.12 feet); minimum, 35 second-feet Sept. 18, 1931.

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

REMARKS.—Records good except those for period of ice effect, Nov. 17 to Mar. 21, which were based on one discharge measurement and temperature records. Minor diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	132	309	-----	-----	3,000	1,080	4,900	5,420	2,380	713	400
2	92	281	-----	-----	6,980	986	3,380	6,700	2,290	472	376
3	74	272	-----	-----	5,200	1,080	2,960	3,330	1,450	409	336
4	92	263	-----	-----	3,420	1,050	2,420	2,050	1,040	376	320
5	106	245	-----	-----	1,970	914	1,660	1,550	1,050	328	313
6	110	218	106	-----	-----	872	1,950	1,070	1,380	306	320
7	115	218	-----	-----	-----	844	22,200	850	1,100	250	328
8	115	192	-----	-----	1,000	670	10,100	5,630	850	250	320
9	124	183	-----	-----	-----	590	9,600	6,970	802	229	313
10	115	166	-----	-----	-----	506	7,080	4,330	1,310	222	299
11	124	166	-----	-----	-----	445	4,200	2,670	1,080	222	306
12	158	174	-----	-----	-----	395	3,380	4,380	768	352	299
13	183	183	-----	-----	800	376	2,380	3,270	590	257	292
14	174	174	-----	-----	-----	263	1,760	2,520	517	1,030	285
15	158	158	-----	-----	-----	272	1,620	1,720	454	1,100	352
16	183	183	-----	-----	-----	338	1,970	1,570	630	2,500	352
17	149	218	-----	-----	-----	281	2,170	3,270	1,160	3,260	352
18	200	-----	-----	-----	1,400	318	1,580	3,270	923	2,560	336
19	158	-----	-----	-----	-----	281	1,040	2,170	790	2,220	299
20	132	-----	-----	-----	-----	263	1,010	3,270	713	2,330	264
21	158	-----	-----	-----	1,800	272	1,510	6,450	580	2,910	250
22	485	-----	-----	-----	2,300	236	1,130	2,470	418	1,870	229
23	158	-----	-----	-----	2,590	272	802	1,350	360	1,308	215
24	158	150	-----	-----	2,430	376	4,140	1,230	306	1,080	201
25	209	-----	-----	-----	2,920	11,800	3,640	1,070	292	910	194
26	970	-----	-----	-----	2,500	18,000	3,750	1,217	306	691	215
27	718	-----	-----	-----	2,010	14,100	886	3,230	445	553	208
28	694	-----	-----	-----	1,690	11,200	802	3,417	454	508	208
29	705	-----	-----	1,500	1,960	9,000	702	2,317	352	481	208
30	602	-----	-----	-----	1,670	6,740	562	2,587	320	436	208
31	366	-----	-----	-----	1,380	-----	1,310	-----	320	409	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	970	74	255	15,700
November	309	-----	185	11,000
December	-----	-----	125	7,690
January	-----	-----	110	6,760
February	-----	-----	250	14,400
March	6,980	-----	1,940	119,000
April	18,000	236	2,790	166,000
May	22,200	562	3,440	212,000
June	6,970	1,070	3,040	181,000
July	2,380	292	820	50,400
August	3,260	222	985	60,600
September	400	194	287	17,100
The year	22,200	-----	1,190	862,000

\* Result of discharge measurement.



## BEAVER CREEK NEAR BURDOCK, S.DAK.

LOCATION.—Chain gage in sec. 8, T. 7 S., R. 1 E., at highway bridge 2 miles west of Burdock. Zero of gage is 3,547.1 feet above mean sea level.

DRAINAGE AREA.—1,480 square miles.

RECORDS AVAILABLE.—April 1905 to November 1906; April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 3,720 second-feet June 18 (gage height, 8.50 feet); minimum, 6 second-feet Oct. 4 (gage height, 1.30 feet).

1905-6, 1929-32: Maximum discharge, that of June 18, 1932; no flow during parts of summer months in 1906, 1930, 1931.

REMARKS.—Records good except those for period of ice effect, Dec. 1 to Mar. 31, which were based on two discharge measurements and temperature records. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Apr.	May	June
1.....	7	20			40	37	14
2.....	12	18			40	32	13
3.....	7	19			38	33	15
4.....	6	20			37	32	15
5.....	7	20			32	46	15
6.....	8	18			64	1,539	17
7.....	7	17			56	735	123
8.....	7	17			44	176	22
9.....	12	21			62	58	17
10.....	11	21			42	38	176
11.....	10	20			35	33	19
12.....	9	20			32	28	19
13.....	10	20			28	22	14
14.....	10	20			23	19	13
15.....	10	21			26	89	13
16.....	10	19			22	32	12
17.....	10	17			17	23	1,940
18.....	10	15			16	21	2,070
19.....	11	16			16	19	220
20.....	10	18			14	19	120
21.....	16	18			15	18	539
22.....	14	18			15	18	340
23.....	472	18		*21	46	54	120
24.....	101	19			1,560	37	64
25.....	44	20			1,840	32	42
26.....	38	20			720	23	50
27.....	30	20			187	19	30
28.....	33	18			99	28	170
29.....	23	17			75	28	54
30.....	20	17	*13		50	20	44
31.....	20					18	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	472	6	32.1	1,970
November.....	21	15	18.7	1,110
December.....			17	1,050
January.....			15	922
February.....			50	2,880
March.....			75	4,610
April.....	1,840	14	176	10,500
May.....	1,580	18	106	6,520
June.....	2,070	12	211	12,600
The period.....				42,200

\* Result of discharge measurement.

## RAPID CREEK NEAR PACTOLA, S.DAK.

LOCATION.—Staff gage in sec. 2, T. 1 N., R. 5 E., at Dakota Power & Light Co.'s flume crossing half a mile below Pactola.

DRAINAGE AREA.—319 square miles.

RECORDS AVAILABLE.—April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June (creek and flume), 393 second-feet Apr. 24; minimum occurred during winter.

1929-32: Maximum discharge (creek and flume), 794 second-feet June 3, 1929; minimum, probably that of 1932.

REMARKS.—Records good except those during period Nov. 28 to Mar. 19, which were based on two discharge measurements and temperature records. Flow of creek regulated by power flume, which diverts water three quarters of a mile upstream.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1	1	0.8				2	14	14
2	1	.8				3	14	10
3	1	.8			2	4	16	6
4	1	.8				14	12	3
5	1	.8				5	10	1
6	2	.8				5	60	1
7	2	.8				1	49	1
8	2	.8			1	.8	42	32
9	2	.8				.9	37	10
10	2	.8				.9	26	25
11	2	.8				.9	20	19
12	2	.8				.9	22	13
13	2	.8			2	.9	16	11
14	2	.8				1	10	5
15	2	.8				1	10	2
16	2	.8				.8	14	31
17	2	.8				.9	7	30
18	2	.8			4	.9	2	12
19	2	.8				1	2	8
20	2	.8			5	1	14	7
21	2	.8		* 30	4	.9	10	4
22	3	45			1	.9	2	1
23	2	21			.9	14	25	1
24	2	22			8	373	20	1
25	1	31			1	179	10	1
26	1	26			3	110	18	4
27	2	29	* 32		4	90	14	3
28	2				1	83	13	1
29	2	30			1	71	10	1
30	2				2	30	5	1
31	5				1		25	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5	1	1.90	117
November	45	.8	9.60	571
December			35	2,150
January			30	1,840
February			35	2,010
March	8	.9	2.35	144
April	373	.8	33.3	1,980
May	60	2	17.7	1,090
June	32	1	8.63	514
The period				10,400

\* Result of discharge measurement.

*Combined discharge, in second-feet, of Rapid Creek and Dakota Power & Light Co.'s flume at Pactola, S.Dak., 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1	24	38				39	85	97
2	24	34				45	85	92
3	25	32			32	47	94	88
4	24	33				63	80	83
5	25	32				60	90	76
6	26	31				61	150	76
7	28	31			16	46	133	78
8	30	31				43	125	117
9	30	32			10	42	110	84
10	29	29			11	39	106	111
11	29	29				37	101	105
12	30	25				39	100	98
13	30	23			32	42	97	96
14	29	26				42	90	88
15	29	31				42	90	82
16	29	34				41	97	124
17	30	28				40	88	110
18	29	26			39	41	79	96
19	29	24				49	77	93
20	29	25			48	42	96	92
21	32	25		30	43	38	94	89
22	36	45			35	38	90	77
23	32	21			28	87	111	70
24	30	22			36	389	100	64
25	30	31			36	196	96	59
26	29	26			40	134	100	86
27	31	29	32		41	114	94	85
28	32				46	107	93	74
29	32	30			34	94	90	62
30	30				35	71	84	53
31	25				33		110	
Month	Maximum		Minimum		Mean		Run-off in acre-feet	
October	36		24		28.9		1,780	
November	45		21		29.4		1,750	
December					35		2,150	
January					30		1,840	
February					35		2,010	
March	48				32.3		1,990	
April	389		37		72.3		4,300	
May	150		77		97.9		6,020	
June	124		53		86.8		5,160	
The period								27,000

## 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.—April to September 1932.

EXTREMES.—Maximum discharge during period, 410 second-feet Apr. 24 (gage height, 3.30 feet); minimum, 6 second-feet Sept. 6 (gage height, 0.58 foot).

REMARKS.—Records excellent. Flow of creek regulated by power plant 100 feet above station.

*Discharge, in second-feet, 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	44	85	91	47	64	38	16	53	95	98	42	91	33
2	51	79	86	52	51	32	17	49	88	119	39	82	32
3	52	78	82	62	44	40	18	54	82	91	39	64	29
4	58	85	77	72	41	35	19	55	78	82	37	59	29
5	69	92	72	84	35	33	20	53	95	85	36	64	29
6	58	128	71	64	35	32	21	46	93	84	36	59	29
7	59	141	74	55	36	31	22	45	87	74	38	50	30
8	51	133	91	51	34	31	23	54	103	67	36	44	30
9	51	119	88	47	30	31	24	426	114	65	45	43	32
10	45	112	92	42	30	31	25	281	99	63	44	43	46
11	48	106	100	42	40	35	26	133	102	69	36	41	49
12	47	111	90	42	52	35	27	108	102	79	35	31	44
13	50	103	81	56	63	34	28	96	96	65	33	44	39
14	57	98	76	52	54	33	29	93	90	59	43	43	36
15	57	92	71	44	102	33	30	90	82	54	46	40	35
							31		93		59	39	
Month							Maximum		Minimum		Mean		Run-off in acre-feet
April							426		44		81.1		4,830
May							141		78		98.7		6,070
June							119		54		79.9		4,750
July							81		33		47.0		2,890
August							102		30		49.9		3,070
September							49		29		34.2		2,040
The period													23,600

## RAPID CREEK AT CRESTON, S.DAK.

LOCATION.—Staff gage in sec. 4, T. 2 S., R. 12 E., at Creston.

DRAINAGE AREA.—710 square miles.

RECORDS AVAILABLE.—April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 16,000 second-feet May 6 (gage height, 12.5 feet); no flow Oct. 1-11.

1929-32: Maximum discharge, that of May 6, 1932; no flow during summer months of 1930, 1931.

REMARKS.—Records good except those for period of ice effect, Nov. 24 to Mar. 17, which were based on one discharge measurement and temperature records. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June
1.....	0	42	-----	762	104	153	159
2.....	0	43	-----	722	86	143	156
3.....	0	41	-----	414	73	141	141
4.....	0	39	-----	340	73	121	129
5.....	0	40	-----	274	73	127	84
6.....	0	36	-----	120	69	6 490	81
7.....	0	36	-----		66	718	115
8.....	0	36	-----		64	640	96
9.....	0	35	-----		62	302	84
10.....	0	34	-----	160	58	277	101
11.....	0	37	-----		56	230	106
12.....	6	36	-----		53	230	138
13.....	7	36	-----		50	208	126
14.....	26	40	-----	240	49	204	106
15.....	28	41	-----		47	222	106
16.....	27	41	-----		25	183	115
17.....	19	41	-----		23	194	144
18.....	21	47	-----	253	24	204	144
19.....	28	47	-----	226	23	166	115
20.....	29	48	-----	214	23	88	81
21.....	29	49	* 60	211	23	98	84
22.....	24	50	-----	220	20	129	81
23.....	27	49	-----	178	309	260	93
24.....	29	40	-----	153	1,430	260	88
25.....	27	30	-----	145	662	302	62
26.....	28	35	-----	143	484	176	204
27.....	29		-----	119	292	150	49
28.....	32		-----	102	446	144	39
29.....	42		-----	109	414	156	36
30.....	42	-----	-----	108	326	159	45
31.....	41	-----	-----	108	-----	153	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	42	0	17.5	1,080
November.....	50	-----	39.6	2,360
December.....	-----	-----	45	2,770
January.....	-----	-----	50	3,070
February.....	-----	-----	110	6,330
March.....	762	102	216	13,300
April.....	1,430	20	184	10,900
May.....	6,490	88	420	25,800
June.....	204	36	104	6,190
The period.....	-----	0	-----	71,800

\* Result of discharge measurement.

## BELLE FOURCHE RIVER NEAR MOORCROFT, WYO.

LOCATION.—Chain gage in sec. 36, T. 50 N., R. 68 W.,  $1\frac{1}{2}$  miles west of Moorcroft and 1 mile above Donkey Creek. Zero of gage is 4,133.44 feet above mean sea level.

DRAINAGE AREA.—1,380 square miles.

RECORDS AVAILABLE.—September 1923 to November 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 1,500 second-feet July 2 (gage height, 6.3 feet); no flow during long periods.

1923-32: Maximum discharge, 12,500 second-feet Apr. 7, 1924; no flow during parts of 1928, 1931, 1932.

REMARKS.—Records fair. No records Nov. 1 to Mar. 26. Small diversion by railroad pump just above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.
1.....	0	0	-----	7	14	1	9	5
2.....	0	0	-----	7	11	1	707	4
3.....	0	0	-----	7	9	1	293	3
4.....	0	0	-----	7	7	.8	370	2
5.....	0	0	-----	7	6	.4	100	1
6.....	0	0	-----	7	527	0	16	1
7.....	0	0	-----	6	419	.2	10	1
8.....	0	0	-----	6	95	6	9	.6
9.....	0	0	-----	5	43	1	8	.6
10.....	0	0	-----	5	16	4	7	.6
11.....	0	0	-----	4	12	4	5	.6
12.....	0	0	-----	4	10	3	4	.6
13.....	0	0	-----	4	9	4	4	.4
14.....	0	0	-----	3	9	5	3	0
15.....	0	0	-----	3	9	5	7	0
16.....	0	0	-----	3	8	1,120	6	419
17.....	0	0	-----	2	7	344	6	56
18.....	0	0	-----	2	7	89	5	10
19.....	0	0	-----	2	7	27	3	6
20.....	0	0	-----	2	5	277	3	4
21.....	0	0	-----	1	5	207	2	2
22.....	0	0	-----	1	5	43	2	1
23.....	0	0	-----	153	4	17	1	.6
24.....	0	0	-----	554	4	12	1	.6
25.....	0	0	-----	641	4	10	1	.2
26.....	0	0	-----	114	3	51	1	.2
27.....	0	0	12	22	3	67	.8	0
28.....	0	0	11	15	3	19	.8	0
29.....	0	0	10	15	2	12	313	0
30.....	0	0	9	18	2	10	95	0
31.....	0	-----	8	-----	2	-----	8	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 27-31.....	12	0.8	10.0	99
April.....	641	1	54.2	3,230
May.....	527	2	40.9	2,510
June.....	1,120	0	77.9	4,640
July.....	707	.8	64.5	3,970
August.....	419	0	16.8	1,030

NOTE.—No flow during October and November 1931, September to November 1932.

## BELLE FOURCHE RIVER AT HULETT, WYO.

LOCATION.—Chain gage in sec. 12, T. 54 N., R. 65 W., at south edge of Hulett. Zero of gage is 3,742.05 feet above mean sea level.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—April 1929 to November 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 3,280 second-feet Apr. 24 (gage height, 6.44 feet); no flow Nov. 26 to Feb. 5.

1929-32: Maximum discharge, 6,230 second-feet May 31, 1929 (gage height, 8.9 feet); no flow July 18-23, 1931, Nov. 26, 1931, to Feb. 5, 1932.

REMARKS.—Records good except those for period of ice effect, Nov. 22, 1931, to Mar. 18, 1932, which were based on one discharge measurement and temperature records. No diversions above Hulett except by pumping near Moorcroft.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	2	3	0	450	58	70	15	33	55	4	3.6	6
2	2	2	0	606	52	67	14	23	37	4	3.6	6
3	3	2	0	498	50	67	12	20	18	4	4	6
4	3	2	0	408	50	62	12	1,020	10	3	4	6
5	3	2	0	387	105	52	12	841	8	3	3.6	6
6	4	2	10	180	129	50	12	395	8	3	3.6	6
7	6	2			82	53	12	126	6	3	3.6	6
8	4	2			56	498	10	63	6	3	4	6
9	4	2			44	255	10	42	5	3	4	6
10	4	2			33	114	11	29	6	3	4.2	6
11	3	2	5	190	33	80	15	22	5	3	4.8	6
12	2	2			30	62	15	14	4	3	4.8	6
13	2	5			28	50	35	12	5	3	4.8	6
14	2	2			26	40	82	12	4	3	4.8	6
15	2	2			28	38	35	10	4	3	4.8	6
16	2	2	10	250	26	29	22	10	5	3	4.8	6
17	2	3		300	21	30	319	8	5	3	4.8	6
18	2	4		400	24	29	534	8	47	3	4.8	6
19	2	2		566	21	25	176	7	47	3	4.8	6
20	2	2		355	21	25	92	6	18	3	4.8	6
21	4	2	25	283	21	25	287	6	11	3	11	6
22	4	1		179	21	19	383	5	8	3	8.4	6
23	3			97	23	14	148	6	6	3	7.6	6
24	2			90	1,990	20	74	5	5	3	6	6
25	2			92	2,230	23	42	5	5	3	6	6
26	1	0	50	76	685	24	35	5	4	3	6	6
27	2	0	100	67	279	15	156	4	4	3	6	6
28	2	0	200	52	153	15	235	4	4	3	6	6
29	1	0	400	50	126	15	108	4	4	3	6	6
30	1	0		56	97	15	47	508	4	3	6	6
31	2			46		15		204	4		6	6

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October	6	1	2.6	160
November	5	0	1.8	107
February	400		34.5	1,980
March	606	46	231	14,200
April	2,230	21	218	13,000
May	498	14	61.2	3,760
June	534	10	98.7	5,870
July	1,020	4	112	6,890
August	55	4	11.7	719
September	4	3	3.1	184
The year	2,230	0	64.5	46,900
1932				
October	11	3.6	5.20	320
November 1-16	6	6	6.00	190

NOTE.—No flow during December 1931 and January 1932.

## 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 1932.

EXTREMES.—Maximum discharge during year, 6,310 second-feet Apr. 24; minimum, 15 second-feet July 27 and 28.

1912-32: Maximum discharge, 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, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	103	126	156	182	136	289	270	574	315	242	34	50
2.....	75	125	160	182	110	740	270	521	374	169	111	44
3.....	75	122	160	215	145	815	270	520	354	136	127	45
4.....	75	121	163	179	150	418	270	418	297	166	92	48
5.....	103	121	164	221	198	279	240	322	234	223	59	48
6.....	88	121	166	191	177	232	225	322	234	674	51	63
7.....	100	121	166	179	182	214	225	316	348	789	44	77
8.....	100	123	160	179	173	250	253	314	357	411	44	62
9.....	100	125	165	179	179	190	288	321	330	288	43	42
10.....	139	130	163	179	191	167	264	524	275	186	49	72
11.....	139	131	160	182	198	167	246	444	444	106	45	72
12.....	142	131	159	179	159	167	197	370	225	87	35	65
13.....	162	147	158	97	145	214	169	350	224	80	35	65
14.....	138	131	130	159	145	250	142	330	210	47	41	66
15.....	137	135	153	131	115	327	159	300	185	43	43	91
16.....	135	136	184	154	168	351	156	342	183	41	47	91
17.....	120	136	176	159	159	422	148	411	191	33	50	95
18.....	103	137	214	159	177	328	243	411	182	28	51	95
19.....	112	137	182	177	179	383	173	276	447	25	53	95
20.....	96	135	178	196	191	307	165	212	435	25	53	95
21.....	131	104	182	191	209	594	227	216	353	24	51	104
22.....	290	123	186	179	201	752	227	208	290	22	50	104
23.....	177	123	182	163	251	432	498	228	292	21	49	101
24.....	96	115	180	177	288	413	6,180	216	520	19	46	105
25.....	154	120	180	179	347	315	2,970	212	317	20	40	81
26.....	135	160	180	182	421	315	3,150	441	283	19	43	81
27.....	129	168	180	198	412	293	1,500	315	251	15	44	85
28.....	127	148	182	177	424	293	896	286	232	15	47	86
29.....	126	148	182	136	436	293	895	258	162	16	49	89
30.....	126	148	182	90	-----	240	631	257	255	52	49	96
31.....	127	-----	186	104	-----	240	-----	551	-----	42	57	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	290	75	125	7,690
November.....	168	104	132	7,860
December.....	214	130	172	10,600
January.....	221	90	170	10,500
February.....	436	110	216	12,400
March.....	815	167	345	21,200
April.....	6,180	142	718	42,700
May.....	574	208	348	21,400
June.....	520	162	294	17,500
July.....	789	15	131	8,060
August.....	127	34	52.6	3,230
September.....	105	42	77.1	4,590
The year.....	6,180	15	231	168,000



## BELLE FOURCHE RIVER NEAR ELM SPRINGS, S.DAK.

LOCATION.—Chain gage in sec. 26, T. 5 N., R. 13 E., 6 miles northeast of Elm Springs.

DRAINAGE AREA.—7,130 square miles.

RECORDS AVAILABLE.—August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 14,400 second-feet Apr. 25 (gage height, 7.9 feet); minimum, 23 second-feet Apr. 14 (gage height, 1.61 feet).

1928-32: Maximum discharge, 33,500 second-feet June 3, 1929 (gage height, 11.3 feet); minimum, 18 second-feet Sept. 16, 1931 (gage height, 1.58 feet).

Maximum stage known, 21.8 feet in May 1927.

REMARKS.—Records good except those for period of ice effect, Nov. 22 to Mar. 20, which were based on comparison with records of Belle Fourche River at Belle Fourche. Diversions for irrigation above station. Flow partly regulated by Belle Fourche Reservoir.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	Day	Oct.	Nov.	Mar.	Apr.	May	June
1-----	116	123	} 350	322	910	6,230	16-----	130	66	} 300	29	310	168
2-----	127	116		394	500	1,800	17-----	84	49		25	168	1,800
3-----	123	110		368	333	1,120	18-----	69	56		27	113	574
4-----	116	96		288	193	646	19-----	72	21		38	93	322
5-----	110	90		219	185	486	20-----	90	61		38	688	238
6-----	130	84	} 150	202	2,690	294	21-----	197	34	466	25	671	200
7-----	145	78		123	559	5,430	22-----	219	486	34	160	176	
8-----	138	72		123	368	2,390	23-----	228	381	84	6,260	160	
9-----	123	52		96	272	1,280	24-----	413	394	7,730	2,830	127	
10-----	168	59		81	228	790	25-----	322	387	14,100	622	99	
11-----	176	72	} 175	69	172	1,940	26-----	256	} 40	500	8,070	419	1,320
12-----	185	66		47	160	928	27-----	215		466	3,240	327	638
13-----	185	66		47	185	544	28-----	172		452	2,040	432	815
14-----	193	66		23	176	250	29-----	153		419	1,140	300	1,040
15-----	185	72		29	850	197	30-----	134		394	1,510	202	1,020
							31-----	103	-----	247	-----	9 160	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	413	69	164	10,100
November-----	123	21	62.3	3,710
December-----			60	3,660
January-----			55	3,380
February-----			110	6,330
March-----	500		305	18,800
April-----	14,100	23	1,350	80,300
May-----	9,160	93	985	60,600
June-----	6,230	99	1,100	65,500
The period-----				252,000

## BAD RIVER BASIN

## BAD RIVER NEAR FORT PIERRE, S.DAK.

LOCATION.—Chain gage in NW¼ sec. 10, T. 4 N., R. 31 E., 2½ miles south of Fort Pierre. Zero of gage is 1,427.83 feet above mean sea level.

DRAINAGE AREA.—3,170 square miles.

RECORDS AVAILABLE.—August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 7,350 second-feet May 7 (gage height, 17.24 feet); no flow during several months.

1928-32: Maximum discharge, 12,600 second-feet Apr. 25, 1929 (gage height, 21.18 feet); no flow for several months each year.

Maximum stage known, 30.89 feet in 1927, as shown by well-defined high-water mark (estimated discharge, about 35,000 second-feet).

REMARKS.—Records good except those for Feb. 20 to Mar. 24, which were estimated because of ice. No diversions.

*Discharge, in second-feet, 1931-32*

Day	Feb.	Mar.	Apr.	May	June	Day	Feb.	Mar.	Apr.	May	June
1.....	0	1,600	168	293	29	16.....	0		6	98	929
2.....	0	1,230	118	262	414	17.....	0		5	69	1,530
3.....	0	877	104	152	191	18.....	0	225	5	64	818
4.....	0	844	63	106	91	19.....	0		5	43	208
5.....	0	300	39	91	102	20.....	0		3	38	159
6.....	0		30	5,580	59	21.....	0		3	383	109
7.....	0		20	6,990	41	22.....	10		1	140	94
8.....	0	150	17	5,440	260	23.....	30	400	1	36	80
9.....	0		14	4,080	544	24.....	120		44	25	64
10.....	0		13	652	852	25.....	300	735	59	21	51
11.....	0		12	481	732	26.....	600	735	28	163	52
12.....	0		10	318	655	27.....	1,000	784	673	72	55
13.....	0	125	9	197	771	28.....	1,580	500	272	44	61
14.....	0		8	129	716	29.....	1,700	414	359	23	42
15.....	0		5	128	259	30.....		221	192	20	35
						31.....		184		16	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February.....	1,700	0	184	10,600
March.....	1,600		391	24,000
April.....	673	1	76.2	4,530
May.....	6,990	16	844	51,900
June.....	1,530	29	333	19,800
The year.....				111,000

NOTE.—No flow during October to January.

## 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.—February 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 350 second-feet May 6 (gage height, 6.0 feet); minimum, 10 second-feet Aug. 12, 13 (gage height, 1.68 feet). 1931-32: Maximum discharge, that of May 6, 1932; minimum, 9 second-feet Sept. 6-15, 1931 (gage height, 1.52 feet).

REMARKS.—Records good except those for Nov. 1 to Mar. 16, which were based on four discharge measurements and temperature records. Small diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14				34	26	73	27	20	17	14
2	14			a 29	32	26	36	26	20	15	14
3	14				26	26	35	26	28	14	13
4	14				26	26	32	25	20	14	13
5	14				22	26	31	29	19	13	13
6	14				22	26	146	29	18	13	14
7	14	a 23			22	25	45	24	18	13	14
8	14				20	24	38	24	17	11	14
9	14				20	24	38	29	17	11	14
10	14				18	27	37	32	17	11	14
11	18				18	26	35	24	16	11	14
12	18				18	26	34	24	14	10	14
13	17				22	24	32	24	34	10	13
14	15		a 15		24	24	32	19	22	137	12
15	15				26	22	34	19	16	24	12
16	15				28	22	33	24	15	20	12
17	15				28	22	32	24	15	17	12
18	15				28	22	30	22	14	16	12
19	15				27	22	27	37	14	15	13
20	15				26	22	24	48	13	15	13
21	17				26	22	24	37	13	17	14
22	17				27	22	24	35	13	17	15
23	17				26	26	24	34	13	15	15
24	17				26	58	24	24	13	15	16
25	17				26	116	24	24	13	15	19
26	17				26	111	24	39	11	16	19
27	17				26	106	25	36	11	17	18
28	17				26	113	27	24	11	17	18
29	17				26	111	27	23	15	17	17
30	18				26	91	27	22	17	15	17
31	18				26		28		19	15	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18	14	15.7	965
November			20	1,190
December			20	1,250
January			20	1,230
February			30	1,730
March	34	18	25.0	1,540
April	116	22	42.1	2,510
May	146	24	35.5	2,180
June	48	19	27.8	1,650
July	34	11	16.6	1,020
August	137	10	18.8	1,160
September	19	12	14.4	857
The year	146	10	23.8	17,300

\* Result of discharge measurement.

## WHITE RIVER BELOW CRAWFORD, NEBR.

LOCATION.—Staff gage in sec. 36, T. 32 N., R. 52 W., 1½ miles east of Crawford.

DRAINAGE AREA.—350 square miles.

RECORDS AVAILABLE.—February to October 1931 (discontinued).

EXTREMES.—Maximum gage height during period, 3.60 feet Aug. 17; no flow July 9-16.

REMARKS.—Records poor. Discharge not determined Aug. 17 because stage was above limit for which rating curve is defined. Some small diversions above station.

*Discharge, in second-feet, 1931*

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1		1	20	1	1	4	10	3	3
2		1	20	8	4	4	10	2	2
3		1	21	2	3	3	9	2	2
4		2	20	1	3	3	9	2	7
5		2	20	1	3	3	8	2	7
6		6	20	20	8	3	10	2	7
7		9	20	20	4	3	11	2	8
8		3	20	20	4	3	7	2	9
9		23	20	20	3	0	5	2	8
10		5	20	20	3	0	4	3	9
11		6	19	20	4	0	5	3	10
12		6	19	20	2	0	5	3	10
13		8	19	20	2	0	5	3	8
14		5	20	20	3	0	5	5	7
15		5	2	15	8	0	5	4	7
16		4	1	15	6	0	8	5	7
17		3	1	16	6	4	5	5	8
18		6	1	16	4	3	2	5	7
19		7	1	16	4	3	3	8	8
20		7	1	16	2	5	3	9	8
21		8	1	16	1	5	3	9	12
22		11	1	17	1	4	3	14	8
23		11	1	11	1	4	10	11	5
24		11	1	2	1	3	4	13	5
25		11	1	1	1	3	2	12	5
26	4	10	1	1	1	3	2	7	5
27	4	7	1	1	1	3	3	5	5
28	4	7	1	1	1	5	3	4	4
29		12	1	1	1	7	4	4	5
30		15	1	1	1	7	5	4	5
31		21	1	1		10	4		5

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	23	1	7.5	461
April	21	1	9.8	583
May	20	1	11.0	676
June	8	1	2.9	173
July	10	0	3.1	191
August		2		
September	14	2	5.2	309
October		0	6.6	406

## WHITE RIVER NEAR CHADRON, NEBR

LOCATION.—Chain gage in sec. 18, T. 33 N., R. 49 W., 6 miles west of Chadron.  
RECORDS AVAILABLE.—October 1931 to September 1932.

EXTREMES.—Maximum stage during year, 16.8 feet Apr. 24 (discharge not determined); no flow Aug. 6–8, Sept. 6–9.

REMARKS.—Records fair except those for Nov. 1 to Mar. 27, which were estimated. Discharge not determined Apr. 24, 25, May 6. Diversions for irrigation above station.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2				* 40	20	33	13	6	0.6	6
2	.4					23	25	12	9	1	5
3	.8			* 12		20	24	9	4	.6	4
4	.8				38	16	24	11	7	.1	1
5	2					15	81	12	5	.4	1
6	2					12		11	3	0	0
7	6	* 3				10	103	16	2	0	0
8	9				30	10	81	38	.9	0	0
9	6					11	55	21	2	2	0
10	11					10	38	22	3	2	5
11	11					9	25	17	4	1	4
12	6					9	24	17	4	.8	4
13	9				32	7	17	14	7	.1	4
14	11		* 15			10	23	13	50	131	6
15	9					10	20	16	31	135	9
16	6					6	17	17	5	16	6
17	9					5	20	38	2	10	7
18	9				36	10	15	22	.6	5	7
19	6					9	15	13	.8	4	5
20	9					7	17	13	.6	3	4
21	16					7	12	11	3	2	4
22	61					5	12	7	3	.4	5
23	26				34	75	14	7	6	2	3
24	6						11	9	8	1	5
25	4						11	6	6	7	4
26	.7				30	111	15	7	4	40	5
27	.7					30	70	20	13	.6	12
28	6					30	39	16	6	.1	10
29	4					33	41	20	2	.6	6
30	2					35	35	20	4	.8	7
31	.7					27		15		.8	6

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	61	0.4	8.13	500
November			15	893
December			25	1,540
January			25	1,540
February			35	2,010
March			38.5	2,090
April		5		
May		11		
June	38	2	13.9	827
July	50	0.1	5.3	357
August	135	0	13.1	806
September	9	0	4.0	238

\* Result of discharge measurement.

## WHITE RIVER NEAR INTERIOR, S.DAK.

LOCATION.—Staff gage in sec. 7, T. 4 S., R. 18 E., 3 miles southwest of Interior.  
DRAINAGE AREA.—4,120 square miles.

RECORDS AVAILABLE.—June 1904 to November 1906; August 1911 to September 1918; August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 6,030 second-feet May 6 (gage height, 10.00 feet); minimum, 4 second-feet Oct. 11–20.

1904–6, 1911–18, 1928–32: Maximum discharge, 16,500 second-feet Mar. 8, 1905 (gage height, 14 feet); no flow for several days during 1914 and 1931.

REMARKS.—Records fair. Discharge estimated Nov. 21 to Feb. 25. No diversions or regulation.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June
1.....	7	32	12	940	276	285	282
2.....	5	32		66?	257	220	141
3.....	5	24		48?	232	196	81
4.....	8	16		32?	204	279	66
5.....	9	15		200	186	620	42
6.....	8	13	150		183	5,440	34
7.....	8	12			153	1,980	38
8.....	6	12			143	912	34
9.....	5	12			138	502	28
10.....	5	12			136	705	543
11.....	4	13	20		131	543	1,540
12.....	4	15			129	323	1,080
13.....	4	15		175	117	223	667
14.....	4	18			112	186	371
15.....	4	21			108	183	234
16.....	4	16	25	300	110	329	320
17.....	4	16		600	112	196	347
18.....	4	15		49?	146	134	220
19.....	4	12		50?	323	105	589
20.....	4	12		45?	237	212	1,340
21.....	5		40	45?	158	86	612
22.....	82		78	53?	134	83	449
23.....	14		100	59?	547	81	452
24.....	7		250	74?	3,090	68	209
25.....	7		400	66?	775	66	158
26.....	7	10	1,520	55?	558	61	1,880
27.....	338		1,730	466	428	64	510
28.....	353		1,570	43?	862	64	317
29.....	142		1,300	371	1,070	66	234
30.....	80			317	399	63	155
31.....	27			288		532	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	353	4	37.7	2,320
November.....	32		14.4	857
December.....			12	738
January.....			10	615
February.....	1,730		253	14,600
March.....	940		387	23,800
April.....	3,090	108	382	22,700
May.....	5,440	61	478	29,400
June.....	1,880	28	432	25,700
The period.....				121,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 12,100 second-feet May 8 (gage height, 6.8 feet); minimum occurred during winter.

1928-32: Maximum discharge, that of May 8, 1932; minimum, 18 second-feet Sept. 16, 1931 (gage height, 1.10 feet).

REMARKS.—Records fair except those for period Jan. 3 to Mar. 24, which were based on two discharge measurements and temperature records. No diversions or regulation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	375	124	38	76	35	3,260	967	1,250	243	247	271	89
2	301	280	52	79		2,130	885	1,390	825	262	224	84
3	200	345	63			2,630	768	1,520	1,760	290	174	76
4	158	301	69			1,990	644	1,080	2,130	320	787	84
5	130	213	72			1,000	617	1,050	2,450	340	470	90
6	116	160	77		44		470	1,670	1,190	485	340	74
7	105	146	76				383	11,600	865	405	247	68
8	95	128	71			500	366	10,300	361	262	198	57
9	88	120	69				340	6,550	5,470	340	136	55
10	82	109	66				320	5,020	2,930	271	130	57
11	79	109	76		55		300	4,290	2,560	281	141	71
12	79	109	69	79			290	2,790	3,130	243	160	60
13	80	98	63			750	276	2,430	787	190	998	57
14	79	103	72				243	1,970	845	178	315	52
15	77	95	79				215	1,820	3,130	144	252	47
16	74	98	82		90		224	1,150	1,850	132	3,740	42
17	71	92	98			900	211	905	4,500	198	2,410	44
18	72	95	96				211	967	1,460	572	1,480	47
19	72	88	90				206	1,250	1,740	378	692	44
20	71	95	82				215	749	2,150	383	617	44
21	72	82	74		100		247	478	1,450	865	378	44
22	72	53	79		325	1,200	262	450	946	711	224	42
23	71	55	76		692		1,030	431	5,840	418	174	42
24	74	60	72		825		998	418	2,090	271	149	44
25	85	52	85		1,850	1,780	1,010	457	1,220	174	290	44
26	98	45	88		1,620	1,780	4,770	538	749	144	215	39
27	88	45	95		1,930	1,900	2,490	2,430	485	124	190	41
28	100	42	92		2,500	1,950	1,480	946	418	149	160	46
29	120	38	85		3,690	1,850	1,160	768	335	170	122	48
30	148	38	82			1,540	1,070	424	262	182	100	53
31	120		79			1,150		290		485	95	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	375	71	111	6,820
November	345	38	114	6,780
December	98	38	76.4	4,700
January			65	4,000
February	3,690		505	29,000
March	3,260		1,240	76,200
April	4,770	206	756	45,000
May	11,600	290	2,170	133,000
June	5,840	243	1,810	108,000
July	865	124	310	19,100
August	3,740	95	512	31,500
September	90	39	56.2	3,340
The year	11,600		644	467,000

## SOUTH FORK OF WHITE RIVER NEAR WHITE RIVER, S. D. A. K.

LOCATION.—Chain gage in sec. 14, T. 41 N., R. 28 W.,  $4\frac{1}{2}$  miles south of White River.

DRAINAGE AREA.—1,390 square miles.

RECORDS AVAILABLE.—April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 3,840 second-feet May 6 (gage height, 8.22 feet); minimum occurred during winter.

1929-32: Maximum discharge, that of May 6, 1932; minimum, 34 second-feet Sept. 11-14, 1931 (gage height, 2.28 feet).

REMARKS.—Records good except those for period of ice effect, Nov. 21 to Mar. 24, which were based on one discharge measurement and temperature records, and those prior to May 8, which are fair. No regulation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June
1	66	99	50	265	225	192	120
2	65	97	50	252	217	186	115
3	66	94	55	273	175	192	112
4	72	97	60	257	169	179	115
5	72	92	65	200	151	169	112
6	74	88	75	100	139	2,820	105
7	74	92			132	445	107
8	79	97			129	594	143
9	79	97			145	866	152
10	81	94			137	678	110
11	85	94	60	110	119	510	110
12	88	94			116	370	192
13	88	97			114	315	105
14	85	97			116	279	105
15	88	99			106	288	110
16	90	97	75	130	102	246	110
17	90	99			99	219	112
18	88	94			109	185	125
19	90	99			121	161	242
20	90	95			106	146	165
21	114	85	80	150	102	161	131
22	90				102	143	120
23	88				104	140	131
24	85				151	128	172
25	85				196	169	143
26	83	80	120	252	160	146	134
27	94		240	257	151	120	128
28	85		370	257	154	120	120
29	90		273	257	169	118	107
30	92		273	175	113	118	100
31	94			252		120	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	114	65	84.2	5,180
November	99		91.2	5,430
December			80	4,920
January			70	4,300
February	370		94.2	5,420
March	273		171	10,500
April	225	99	139	8,270
May	2,820	118	338	20,800
June	242	100	128	7,620
The period				72,400

\* 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 1932.

EXTREMES.—Maximum discharge during year, 594 second-feet May 6 (gage height, 8.00 feet); minimum, 1 second-foot Sept. 22 (gage height, 1.80 feet).

1931-32: Maximum discharge, 627 second-feet Aug. 6, 1931; maximum gage height, that of May 6, 1932; minimum discharge, that of Sept. 22, 1932.

REMARKS.—Records fair except those for November to February, which were based on two discharge measurements and temperature records. Discharge estimated because of ice Mar. 4, 5, 7, 10, 11. No diversions or regulation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7			101	80	54	34	23	17	22
2	18			89	79	53	32	19	22	19
3	18		a 34	85	80	52	32	22	21	19
4	13			80	79	51	31	20	25	23
5	12			75	75	202	21	17	26	23
6	12			71	73	449	20	17	26	22
7	12			60	67	137	17	15	22	22
8	12			48	67	52	14	17	22	20
9	12	a 19		44	69	50	27	17	22	19
10	11			40	67	47	16	16	22	18
11	19			45	67	43	15	17	20	22
12	20			57	67	46	15	16	19	21
13	10			53	65	45	13	28	20	19
14	15			79	67	47	13	17	19	16
15	14			83	62	42	13	17	20	18
16	16			87	61	45	17	20	19	17
17	16			89	58	45	17	20	18	18
18	19			107	59	45	16	18	17	18
19	20			95	49	44	16	19	14	6
20	20			103	30	43	18	19	14	5
21	22			95	28	44	22	19	12	5
22	22			95	24	42	33	20	12	1
23	30			95	52	40	21	22	12	2
24	30			91	81	38	21	17	12	2
25	29			90	84	37	19	16	24	2
26	29			87	84	36	51	17	27	2
27	29			86	83	37	50	34	23	2
28	29			85	83	38	35	22	26	2
29	28			83	56	36	34	19	24	2
30	28			82	59	36	21	17	26	2
31	29			79		36		17	24	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	30	7	19.4	1,190
November			25	1,490
December			25	1,540
January			20	1,230
February			40	2,300
March	107	40	79.3	4,880
April	84	24	65.2	3,880
May	449	36	64.9	3,990
June	51	13	23.5	1,400
July	34	15	19.2	1,180
August	27	12	20.2	1,240
September	23	1	13.0	774
The year	449	1	34.6	25,100

a Result of discharge measurement.

## NIOBRARA RIVER NEAR GORDON, NEBR.

LOCATION.—Staff gage in sec. 15, T. 31 N., R. 41 W., 14 miles southeast of Gordon.  
DRAINAGE AREA.—3,050 square miles.

RECORDS AVAILABLE.—August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 2,630 second-feet May 6 (gage height, 2.40 feet); minimum occurred during winter.

1928-32: Maximum discharge, that of May 6, 1932; minimum, 58 second-feet July 29, 30, 1931 (gage height, 0.28 foot).

REMARKS.—Records fair. Discharge estimated Nov. 22 to Dec. 11, Dec. 13-26, Jan. 1 to Feb. 25, Mar. 4-15. No diversions or regulation.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	87	125	145	120	120	126	240	285	205	189
2	87	138				189	273	205	193	
3	87	131				177	291	230	185	
4	87	120				68	387	225	173	
5	100	128	140	130	140	65	367	279	165	
6	107	134				279	2,090	144		
7	100	134				291	1,130	165		
8	112	134				354	572	165		
9	100	134	135	140	160	200	250	279	150	
10	112	147				261	285	111		
11	94	150				261	279	120		
12	94	123				261	285	114		
13	100	141	135	140	160	200	315	261	99	
14	110	141				348	322	91		
15	107	131				374	328	91		
16	112	134				514	394	303	95	
17	105	128	120	110	140	581	415	279	120	
18	107	138				482	279	267	141	
19	107	134				538	450	255	153	
20	112	138				297	450	267	144	
21	112	81	170	140	240	181	422	220	105	
22	115	80				348	380	225	97	
23	118					285	547	156	93	
24	115					303	651	162	97	
25	125					297	522	173	89	
26	131	100	200	130	310	273	422	162	129	
27	128					310	267	165	101	
28	112					315	279	328	185	
29	110					210	315	273	261	197
30	118	128	216			297	205	201	89	
31	128					315		156		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	131	87	108	6,640
November	150		119	7,080
December	247		156	9,590
January			128	7,870
February	315		181	10,400
March	581		246	15,100
April	651	205	357	21,200
May	2,090	156	334	20,500
June	193	89	129	7,680
The period				106,000

\* Result of discharge measurement.

NIOBRARA RIVER NEAR VALENTINE, NEBR.

LOCATION.—Chain gage in sec. 30, T. 33 N., R. 28 W., 7 miles southwest of Valentine.

DRAINAGE AREA.—6,160 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932 (discontinued). At station 8 miles downstream from July to October 1897, April to September 1899, June 1901 to November 1906.

REMARKS.—Records of daily discharge not sufficiently accurate for publication, estimated on basis of percentage study of Niobrara River near Gordon and near Spencer. No diversions or regulation.

*Discharge, in second-feet, 1931-32*

Month	Mean	Run-off in acre- feet	Month	Mean	Run-off in acre- feet
October.....	820	50,400	May.....	1,150	70,700
November.....	725	43,100	June.....	880	52,400
December.....	928	57,100	July.....	675	41,500
January.....	784	48,200	August.....	669	41,100
February.....	1,010	58,100	September.....	687	40,900
March.....	850	52,500			
April.....	1,050	62,500	The year.....	851	618,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 7,910 second-feet May 26; minimum, 10 second-feet, leakage through gates at times.

1928-32: Maximum discharge, 15,200 second-feet Sept. 6, 1930.

REMARKS.—Records good. Flow regulated by Spencer Reservoir, capacity, 2,300 acre-feet. Discharge computed from flow over spillway and through turbines and gates. Base data furnished by Northern Nebraska Power Co.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	867	1,010	1,100	870	582	2,940	1,450	1,510	1,340	867	924	833
2.....	883	1,110	1,080	850	443	2,690	1,400	1,400	2,710	1,010	779	758
3.....	915	1,100	1,060	862	480	2,190	1,300	1,320	2,400	1,010	918	708
4.....	818	1,090	1,020	852	585	1,310	1,330	1,300	1,700	1,110	891	747
5.....	921	1,090	1,050	820	670	603	1,290	1,530	1,230	1,090	797	757
6.....	975	1,100	989	900	898	618	1,250	2,040	1,100	996	1,520	706
7.....	966	1,110	1,020	921	1,020	410	1,240	1,970	1,000	914	1,250	718
8.....	1,010	1,060	934	857	1,120	337	1,260	3,840	2,300	872	947	679
9.....	991	1,100	993	959	1,300	201	1,180	3,060	4,120	894	753	695
10.....	986	1,110	915	987	1,420	115	1,380	2,180	2,700	729	664	822
11.....	869	1,130	1,090	1,030	1,820	149	1,410	1,790	2,590	800	669	1,330
12.....	1,190	1,170	1,100	1,330	2,020	249	1,280	1,430	2,300	721	762	1,220
13.....	1,240	1,160	986	1,240	1,760	362	1,200	1,360	1,700	880	931	951
14.....	1,100	1,140	803	886	1,430	408	1,160	1,250	1,360	898	850	933
15.....	1,060	1,020	798	733	1,310	757	1,160	1,230	1,210	769	751	834
16.....	1,070	1,100	726	683	1,350	2,440	1,210	1,370	2,370	1,110	891	923
17.....	1,100	1,200	798	593	1,260	4,680	1,190	1,200	3,930	743	923	840
18.....	968	1,100	804	547	1,100	5,320	1,260	1,130	2,130	989	877	739
19.....	1,010	1,180	1,000	725	1,190	2,910	1,340	981	1,460	740	828	793
20.....	1,030	1,150	1,180	906	1,340	1,560	1,370	1,050	1,800	609	885	833
21.....	1,030	677	1,430	1,100	1,330	1,410	1,330	1,020	1,770	659	734	841
22.....	1,260	400	1,630	1,190	1,550	2,220	1,250	952	1,450	685	687	857
23.....	1,120	416	1,790	1,290	1,850	2,040	1,340	2,100	1,220	816	638	825
24.....	1,140	353	1,860	1,270	2,260	1,830	1,570	1,000	1,200	653	634	865
25.....	960	433	1,710	1,180	2,770	1,830	1,630	1,320	1,120	740	629	771
26.....	1,060	414	1,730	1,150	2,980	1,780	1,880	4,780	1,220	720	695	893
27.....	1,050	552	1,760	1,090	3,920	1,670	1,960	1,900	1,130	703	778	1,060
28.....	948	997	1,820	1,140	5,680	1,740	1,840	1,350	1,070	756	946	908
29.....	994	1,090	1,930	1,120	4,240	1,640	1,780	1,220	983	1,020	875	944
30.....	1,060	1,060	1,780	814	-----	1,610	1,620	1,390	969	1,060	876	912
31.....	1,110	-----	1,590	645	-----	1,420	-----	2,480	-----	1,020	772	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,260	818	1,020	62,700
November.....	1,200	353	954	56,800
December.....	1,930	726	1,240	76,200
January.....	1,330	547	953	58,600
February.....	5,680	443	1,710	98,400
March.....	5,320	115	1,590	97,800
April.....	1,960	1,160	1,400	83,300
May.....	4,780	952	1,700	105,000
June.....	4,120	969	1,790	107,000
July.....	1,110	609	858	52,800
August.....	1,520	629	841	51,700
September.....	1,330	679	860	51,200
The year.....	5,680	115	1,240	902,000

## BAZILLE CREEK BASIN

## BAZILLE CREEK NEAR NIOBRARA, NEBR.

LOCATION.—Chain gage in sec. 33, T. 32 N., R. 5 W., 6½ miles south of Niobrara.  
DRAINAGE AREA.—465 square miles.

RECORDS AVAILABLE.—October 1931 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 867 second-feet May 26 (gage height, 5.34 feet); minimum occurred during winter.

REMARKS.—Records good. Discharge not computed for Oct. 1 to Mar. 20, July 10 to Sept. 30. Minor regulation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					100	70	52	182	30		
2						66	47	140	34		
3						69	46	144	55		
4						69	45	108	64		
5						66	46	75	41		
6					50	58	108	91	40		
7		a 34				48	121	72	68		
8						53	72	118	42		
9	a 23		a 32	a 29		48	58	118	35		
10	a 25					52	52	297			
11					50	47	52	279			
12						50	48	158			
13						52	44	417		a 127	a 43
14						60	53	41	a 25		
15						70	50	39	121		
16					110	51	40	98			
17						52	40	91			
18						52	41	78			
19		a 33				57	45	72			
20						58	37	65			
21						66	52	31	58		
22						64	47	33	58		
23						68	55	29	53		
24						89	58	32	53		
25						164	53	69	88		
26						119	53	582	50		
27						89	53	116	42		
28						78	52	61	46		
29						85	50	37	38		
30						78	51	34	36		
31						64		424			

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	164		82.1	5,050
April	70	47	54.8	3,260
May	582	29	81.4	5,010
June	417	36	116	6,900
The period				20,200

a Result of discharge measurement.

## JAMES RIVER BASIN

## JAMES RIVER AT JAMESTOWN, N.DAK.

LOCATION.—Tape gage on bridge in SE¼ sec. 36, T. 140 N., R. 64 W., about 1 mile southeast of Northern Pacific Railway depot at Jamestown. Staff gage at same location used prior to Feb. 20, 1931.

DRAINAGE AREA.—3,140 square miles.

RECORDS AVAILABLE.—June 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 722 second-feet Feb. 28 (gage height, 12.38 feet); minimum, 0.2 second-foot Nov. 12-16 (gage height, 6.14 feet).

1928-32: Maximum discharge, 1,100 second-feet Mar. 14, 1929 (gage height, 14.2 feet); minimum, 0.2 second-foot Sept. 15-18, 1929, Nov. 12-16, 1931.

REMARKS.—Records fair. Discharge estimated Aug. 19 to Sept. 6. No diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1.4	0.6	1.0	1.2	1.2	388	47	33	6.9	6.9	1.2	2.0
2.....	1.4	.8	1.0	1.2	1.4	196	47	30	6.5	7.2	1.4	
3.....	1.4	.8	1.0	1.2	1.4	208	46	29	28.0	7.6	1.0	
4.....	1.4	.6	1.0	1.2	1.2	196	42	28	20.0	8.7	1.0	
5.....	1.4	.6	1.0	1.2	1.2	190	40	37	13.0	8.7	1.0	
6.....	1.4	.6	1.0	1.2	1.4	160	37	33	9.8	6.9	.8	2.0
7.....	1.6	.6	1.0	1.2	1.4	96	37	27	8.0	5.2	1.0	
8.....	1.2	.6	1.0	1.2	1.4	62	44	18	6.9	4.2	1.0	
9.....	1.4	.4	1.0	1.2	1.4	42	46	16	6.5	2.8	1.0	
10.....	1.2	.4	1.0	1.2	1.2	41	47	15	6.2	1.8	1.2	
11.....	1.2	.4	1.0	1.2	1.2	42	48	8.7	6.0	1.8	1.2	1.8
12.....	1.2	.2	1.0	1.2	1.2	42	46	4.0	5.8	1.8	1.2	1.8
13.....	1.2	.2	1.0	1.2	1.2	43	45	4.2	5.5	1.8	1.2	1.8
14.....	1.8	.2	.8	1.2	1.2	45	40	3.8	5.8	1.8	1.2	2.4
15.....	1.4	.2	.8	1.2	1.2	44	37	4.0	5.8	1.6	1.2	2.4
16.....	1.2	.2	.8	1.2	1.2	42	36	4.0	6.0	1.6	1.2	2.6
17.....	1.2	.6	1.0	1.2	1.4	33	32	4.2	14.0	1.6	1.2	2.8
18.....	1.0	.6	1.0	1.2	1.4	33	26	4.0	37.0	1.4	1.0	2.8
19.....	1.0	.6	1.0	1.4	1.4	22	26	4.0	33.0	1.2		3.0
20.....	.8	.6	1.2	1.4	1.4	19	26	4.0	31.0	1.2		3.4
21.....	1.0	.8	1.2	1.2	1.4	18	24	4.2	29.0	1.4		3.4
22.....	6.9	.8	1.4	1.2	1.4	15	24	4.2	18.0	1.2		3.8
23.....	.8	.8	1.6	1.2	1.6	14	34	4.5	16.0	1.2		4.0
24.....	.4	1.0	1.6	1.2	4.0	15	38	4.8	16.0	1.4		4.0
25.....	.4	1.0	1.8	1.2	9.6	36	41	5.2	16.0	1.4	1.0	7.2
26.....	.4	1.0	1.6	1.2	248.0	49	50	10	15.0	1.6		11.0
27.....	.6	1.0	1.4	1.4	276.0	63	45	9.1	12.0	1.4		9.5
28.....	1.0	1.0	1.4	1.4	626.0	66	40	7.2	9.5	1.6		9.8
29.....	1.4	1.0	1.2	1.4	610.0	80	37	6.9	7.6	1.8		10.0
30.....	1.2	1.0	1.2	1.2	-----	86	34	6.9	6.9	1.8		11.0
31.....	1.0	-----	1.2	1.2	-----	69	-----	6.9	-----	1.4	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	6.9	.4	1.32	81
November.....	1.0	.2	.64	38
December.....	1.8	.8	1.14	70
January.....	1.4	1.2	1.23	76
February.....	626	1.2	65.2	3,750
March.....	388	14	79.2	4,870
April.....	50	24	38.7	2,300
May.....	37	3.8	12.3	756
June.....	37	5.5	13.6	809
July.....	8.7	1.2	2.97	183
August.....	1.4	.8	1.06	65
September.....	11	1.8	3.95	235
The year.....	626	.2	18.2	13,200

## JAMES RIVER AT HURON, S.DAK.

LOCATION.—Chain gage in sec. 6, T. 110 N., R. 61 W., at Huron. Zero of gage is 1,228.70 feet above mean sea level.

DRAINAGE AREA.—11,500 square miles.

RECORDS AVAILABLE.—August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 595 second-feet Mar. 22 (gage height, 5.24 feet); no flow Oct. 1 to Feb. 15.

1928-32: Maximum discharge, 2,110 second-feet Mar. 20, 1929 (gage height, 12.0 feet); no flow during part of 1930, 1931, 1932.

REMARKS.—Records good except those for period Feb. 16 to Mar. 15, which were estimated. Minor diversions for city water supplies above station.

*Discharge, in second-feet, 1931-32*

Day	Feb.	Mar.	Apr.	May	June
1.....	0	600	434	137	165
2.....	0		413	137	161
3.....	0		394	210	145
4.....	0		344	228	153
5.....	0		346	217	111
6.....	0	150	315	262	111
7.....	0		291	293	111
8.....	0		288	310	104
9.....	0		288	327	98
10.....	0		264	327	99
11.....	0	100	202	344	109
12.....	0		179	380	104
13.....	0		226	439	98
14.....	0		224	418	97
15.....	0		206	322	91
16.....	10		165	322	83
17.....		336	165	332	83
18.....		408	165	322	95
19.....		465	159	320	139
20.....		525	89	322	84
21.....	20	558	82	298	82
22.....		584	35	298	74
23.....		543	49	252	74
24.....		525	107	272	74
25.....		527	137	226	74
26.....	150	540	179	219	74
27.....		499	117	198	74
28.....		460	127	157	74
29.....		457	119	161	75
30.....		512	177	165	76
31.....		426		165	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February.....			25.9	1,490
March.....			378	23,200
April.....	434	35	210	12,500
May.....	439	137	270	16,600
June.....	165	74	99.7	5,930
The period.....				59,700

NOTE.—No flow October to January.

## 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 1932.

EXTREMES.—Maximum discharge during year, 2,500 second-feet Mar. 2 (estimated); minimum, 2 second-feet Oct. 28 to Nov. 1.

1928-32: Maximum discharge, 2,970 second-feet Mar. 31, 1929 (gage height, 11.92 feet); minimum, 2 second-feet Sept. 14-18, Oct. 28 to Nov. 1, 1931.

REMARKS.—Records good except those for Nov. 21 to Mar. 23, which were based on two discharge measurements and temperature records. Operation of water-power plant 20 miles upstream may affect flow slightly.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	2			900	1,280	201	267	66	31	28
2	5	4			2,500	1,190	201	246	60	36	26
3	4	4		9	2,300	1,080	199	235	70	37	22
4	4	4			1,530	933	205	207	43	32	24
5	4	3			900	848	197	178	50	28	23
6	5	3				758	273	168	63	30	23
7	11	3		12		710	273	157	72	30	26
8	9	3			250	632	333	146	85	27	22
9	6	4		13		575	341	134	97	24	20
10	5	4		15		570	317	156	123	26	19
11	5	3				518	301	156	142	22	22
12	5	4	9			470	303	135	138	22	20
13	7	8		25	200	437	313	126	159	22	20
14	7	10				417	317	134	177	26	33
15	7	10				393	313	134	185	36	36
16	6	8				375	377	118	185	58	29
17	5	9				351	404	117	181	64	28
18	6	9		35	330	321	382	134	143	53	26
19	5	8				339	373	137	134	42	21
20	4	9				311	373	134	126	44	20
21	3	9				287	365	147	120	30	20
22	6				425	279	357	137	111	28	20
23	6			40		323	325	134	100	22	17
24	5				612	301	317	118	74	27	14
25	5				628	289	319	118	55	26	11
26	3	9			50	958	273	327	116	63	23
27	3			125	1,030	233	325	111	49	27	9
28	2			350	1,260	175	301	95	51	26	12
29	2			500	1,450	91	275	77	58	24	19
30	2				1,410	124	253	78	51	22	19
31	2				1,370		249		37	30	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	11	2	5	307
November	10	2	6.7	399
December			9	553
January			8	492
February			56.3	3,240
March	2,500		710	43,70
April	1,280	91	496	29,500
May	404	197	304	18,700
June	267	73	144.4	8,570
July	185	37	99.0	6,090
August	64	22	31.5	1,940
September	36	9	21.3	1,270
The year			158	115,000

\* Result of discharge measurement.



## BIG SIOUX RIVER BASIN

## BIG SIOUX RIVER NEAR FLANDREAU, S.DAK.

LOCATION.—Chain gage in sec. 9, T. 107 N., R. 48 W., 2 miles north of Flandreau.

DRAINAGE AREA.—2,520 square miles.

RECORDS AVAILABLE.—August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 3,340 second-feet Feb. 2<sup>7</sup> (gage height, 10.6 feet); minimum occurred during winter.

1928-32: Maximum discharge, 5,200 second-feet Mar. 15, 1929 (gage height, 14.04 feet); no flow Sept. 14-18, 1931.

REMARKS.—Records good except those for Nov. 25 to Mar. 29, which were based on one discharge measurement and temperature records. No diversions or regulation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	4	12	-----	5	2,660	113	58	30
2.....	3	12	-----		2,070	101	57	28
3.....	3	12	-----		1,510	100	56	28
4.....	4	12	-----		1,260	102	56	27
5.....	4	12	-----		788	104	53	26
6.....	4	11	-----	5		100	50	25
7.....	5	11	-----			98	54	25
8.....	5	10	-----		150	96	56	28
9.....	6	10	-----			94	56	32
10.....	6	10	-----			92	54	34
11.....	6	11	-----	12		87	50	39
12.....	6	12	-----			84	48	81
13.....	7	12	-----		50	78	48	148
14.....	7	12	-----			72	46	150
15.....	7	12	-----			70	44	129
16.....	7	12	-----	6		68	40	101
17.....	6	11	-----			66	39	116
18.....	6	11	-----		70	64	37	84
19.....	6	12	-----			61	35	62
20.....	7	12	-----			60	35	131
21.....	8	12	-----	75		59	33	88
22.....	8	13	-----			59	33	60
23.....	8	12	-----		90	62	31	50
24.....	8	11	-----			63	31	49
25.....	7	10	-----			68	34	46
26.....	8		-----	8	600	72	35	41
27.....	8		-----		2,910	69	33	38
28.....	9		-----		3,340	64	33	34
29.....	10		-----		3,140	63	31	29
30.....	11		-----			133	60	31
31.....	12		-----			117		30

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	12	3	6.6	406
November.....	13	-----	10.9	649
December.....	-----	-----	7	430
January.....	-----	-----	5	307
February.....	3,340	-----	362	20,800
March.....	2,660	-----	346	21,300
April.....	113	59	78.3	4,660
May.....	58	30	42.8	2,630
June.....	150	25	59.5	3,540
The period.....	-----	-----	-----	54,700

\* Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 13,400 second-feet Mar. 1 (gage height, 18.04 feet); minimum, 58 second-feet Sept. 6 (gage height, 1.46 feet).  
1928-31: Maximum discharge, 14,000 second-feet Mar. 15, 1929 (gage height, 18.63 feet); minimum, 26 second-feet Aug. 7, 1931 (gage height, 1.34 feet).

REMARKS.—Records good except those for period Jan. 1 to Mar. 23, which were based on three discharge measurements and temperature records. Discharge estimated Dec. 26, 27. No diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	65	67	176	100	110	13,300	2,140	529	302	535	132	968
2.....	65	65	164			12,300	1,820	505	297	466	137	673
3.....	67	65	164			10,400	1,600	592	287	463	130	472
4.....	67	62	159			8,440	1,520	514	289	430	118	359
5.....	60	62	128	110	120	7,070	1,440	484	248	410	118	343
6.....	58	62	118			6,850	1,340	972	243	387	108	292
7.....	419	62	140			6,170	1,260	616	258	960	130	250
8.....	76	62	135				1,180	736	240	586	99	233
9.....	67	65	116	135	150	3,600	1,100	864	365	535	88	218
10.....	67	62	108				1,020	709	343	422	92	223
11.....	76	62	116				956	598	348	359	318	300
12.....	85	72	111				892	550	469	329	343	445
13.....	97	72	99	140	100	1,000	854	508	544	367	1,780	466
14.....	90	72	159				784	469	956	376	1,870	454
15.....	88	72	147				742	448	1,140	310	1,460	428
16.....	85	72	128				706	433	1,380	274	992	359
17.....	81	120	111	155	250		679	407	1,580	253	812	279
18.....	76	120	99			1,020	649	370	1,820	236	523	248
19.....	76	425	99				616	337	1,230	210	436	223
20.....	76	607	99				598	327	3,300	196	387	206
21.....	76	759	99	130	600	1,100	1,740	324	1,720	180	321	190
22.....	76	526	99			1,200	1,800	289	2,060	171	289	186
23.....	76	404	104			1,300	721	269	2,080	161	238	178
24.....	72	340	113			1,550	637	274	2,330	149	213	176
25.....	72	154	137	130	9,000	3,220	610	274	1,670	135	198	159
26.....	69	106	160			2,510	640	3,050	1,170	132	176	154
27.....	69	137	220			1,000	5,460	637	637	902	159	147
28.....	67	183	354			4,000	8,080	592	402	776	159	144
29.....	62	171	289	130	5,210	8,410	574	348	670	149	2,110	154
30.....	62	159	289			5,210	547	337	607	144	2,280	140
31.....	65	-----	346			2,890	-----	327	-----	140	1,400	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	419	58	84.1	5,170
November.....	759	62	176	10,500
December.....	354	99	154	9,470
January.....	-----	-----	128	7,870
February.....	-----	-----	626	36,000
March.....	13,300	-----	4,080	251,000
April.....	2,140	547	1,010	60,100
May.....	3,050	269	564	34,700
June.....	3,300	240	987	58,700
July.....	960	132	316	19,400
August.....	2,280	88	569	35,000
September.....	968	140	302	18,000
The year.....	13,300	58	752	546,000

## LITTLE SIOUX RIVER BASIN

## LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA

LOCATION.—Chain gage in sec. 34, T. 89 N., R. 42 W., half a mile west of Correctionville and 1,000 feet above Bacon Creek.

DRAINAGE AREA.—2,450 square miles.

RECORDS AVAILABLE.—May 1918 to September 1924; October 1928 to July 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 5,920 second-feet Apr. 21 (gage height, 16.12 feet); minimum, 24 second-feet Oct. 5 (gage height, 2.18 feet).

1918-24, 1928-32: Maximum discharge (estimated), 20,700 second-feet Mar. 12, 1919 (gage height, 19.57 feet); minimum, 5 second-feet Aug. 18, 1922.

REMARKS.—Records good except those for Jan. 1 to Mar. 26, which were based on four discharge measurements and temperature records. No diversion.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1.....	32	38	230	-----	-----	-----	3,790	582	754	324
2.....	32	38	264	-----	a 146	-----	3,320	565	668	312
3.....	30	39	251	-----	-----	2,000	3,170	551	516	-----
4.....	29	37	240	-----	-----	-----	2,560	505	632	-----
5.....	24	38	208	-----	-----	-----	2,200	1,180	704	-----
6.....	25	38	149	-----	-----	-----	1,900	2,350	490	-----
7.....	66	38	158	-----	-----	-----	1,690	1,840	432	-----
8.....	1,230	37	116	-----	-----	600	1,570	960	386	-----
9.....	346	38	130	-----	-----	-----	1,310	1,000	382	-----
10.....	257	37	155	-----	-----	-----	1,330	918	511	-----
11.....	217	43	314	-----	-----	-----	1,200	834	570	-----
12.....	149	45	281	-----	-----	-----	1,070	778	451	-----
13.....	139	42	240	a 248	-----	500	974	710	1,090	-----
14.....	102	45	253	-----	-----	-----	884	623	971	-----
15.....	88	46	302	-----	-----	-----	800	650	1,020	-----
16.....	78	43	326	-----	-----	750	731	554	922	-----
17.....	67	51	298	-----	-----	a 957	644	490	884	-----
18.....	60	53	286	-----	-----	1,050	623	449	859	-----
19.....	58	58	206	-----	-----	800	579	406	831	-----
20.....	55	75	206	-----	-----	750	554	372	908	-----
21.....	53	80	162	-----	-----	-----	4,870	350	1,160	-----
22.....	50	92	159	-----	-----	-----	1,940	310	1,040	-----
23.....	50	415	153	-----	a 150	900	1,060	394	817	-----
24.....	45	750	150	-----	-----	-----	932	343	650	-----
25.....	43	608	152	-----	-----	-----	796	329	596	-----
26.....	36	370	148	-----	-----	1,500	817	3,740	565	-----
27.....	38	307	156	-----	500	2,500	772	1,870	498	-----
28.....	40	288	156	-----	-----	2,060	1,010	1,180	403	-----
29.....	40	183	152	-----	-----	2,050	884	971	374	-----
30.....	40	152	199	-----	-----	2,800	635	814	331	-----
31.....	38	-----	389	-----	-----	3,490	-----	887	-----	-----

Month	Maximum	Minimum	Mean	Pun-off in acre-feet
October.....	1,230	24	115	7,070
November.....	750	37	137	8,150
December.....	389	116	213	13,100
January.....	-----	-----	220	13,500
February.....	-----	-----	200	11,500
March.....	3,490	-----	1,250	76,900
April.....	4,870	554	1,490	88,700
May.....	3,730	310	887	54,500
June.....	1,160	331	680	40,500
The period.....	-----	-----	-----	314,000

a Result of discharge measurements.

## 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 1932.

EXTREMES.—Maximum discharge during year, 4,190 second-feet Apr. 17; minimum, 78 second-feet Sept. 21 (gage height, 0.98 foot).

1915-32: Maximum discharge, 6,720 second-feet June 11, 1923 (gage height, 6.24 feet); minimum, 33 second-feet Sept. 13-15, 1931 (gage height, 0.80 foot).

REMARKS.—Records good except those for Nov. 16 to Apr. 15, which were based on one discharge measurement and comparison with flow of North Platte River at Saratoga. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1.....	119	185	-----	-----	981	1,280	1,920	793	203
2.....	116	185	-----	-----	1,140	1,290	1,780	819	182
3.....	128	175	-----	900	1,480	1,180	1,710	622	168
4.....	140	172	-----	-----	1,710	1,190	1,520	498	152
5.....	137	165	-----	-----	1,700	1,320	1,310	422	137
6.....	143	159	-----	-----	1,760	1,520	1,010	378	134
7.....	156	159	-----	-----	1,820	1,530	810	357	122
8.....	175	162	-----	820	1,860	1,420	710	351	113
9.....	168	172	-----	-----	1,880	1,310	665	341	110
10.....	162	162	75	-----	2,000	1,340	629	317	108
11.....	167	178	-----	980	2,160	1,410	574	308	110
12.....	189	168	-----	1,000	2,360	1,420	608	298	108
13.....	203	146	-----	1,080	2,600	1,450	725	289	105
14.....	196	131	-----	1,600	2,710	1,590	695	280	102
15.....	182	165	-----	2,280	2,850	1,680	608	285	102
16.....	172	162	-----	3,680	2,660	1,770	580	270	105
17.....	165	-----	-----	3,720	2,160	1,920	587	265	105
18.....	159	140	-----	3,020	2,000	2,070	608	260	100
19.....	152	-----	-----	2,280	2,020	1,890	567	255	94
20.....	152	-----	-----	2,070	2,530	1,670	548	250	88
21.....	172	-----	-----	2,350	2,800	1,870	510	246	83
22.....	182	-----	-----	2,820	2,770	1,770	480	234	91
23.....	207	110	-----	2,560	2,710	1,770	456	226	96
24.....	203	-----	-----	1,390	2,770	1,970	445	218	96
25.....	196	-----	-----	1,080	2,520	2,070	474	200	105
26.....	185	-----	-----	1,210	2,260	2,120	492	182	110
27.....	149	-----	-----	1,170	1,870	2,070	474	258	116
28.....	156	100	-----	1,180	1,650	2,270	428	263	116
29.....	172	-----	-----	1,060	1,240	2,380	445	242	116
30.....	162	-----	-----	1,000	1,170	2,150	492	218	116
31.....	168	-----	-----	-----	1,310	-----	587	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	207	116	166	10,200
November.....	185	-----	142	8,450
December.....	-----	-----	110	6,760
January.....	-----	-----	105	6,460
February.....	-----	-----	110	6,330
March.....	-----	-----	160	9,840
April.....	3,720	-----	1,540	91,600
May.....	2,850	981	2,050	126,000
June.....	2,380	1,180	1,690	101,000
July.....	1,920	428	756	46,500
August.....	819	182	327	20,100
September.....	203	83	116	6,900
The year.....	3,720	-----	605	440,000

\* 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 1932.

EXTREMES.—Maximum discharge during year, 10,100 second-feet May 23 (gage height, 8.64 feet); minimum occurred during winter.

1903-6, 1909, 1911-32: Maximum discharge, 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 Nov. 24 to Mar. 20, which were based on two discharge measurements and temperature records. A few diversions between Northgate and Saratoga.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	285	405	210	235	228	285	744	1,940	4,690	4,260	1,140	392
2.	276	412					1,400	2,180	4,310	4,190	1,250	392
3.	276	419					2,100	2,710	4,100	3,840	1,150	366
4.	290	398					1,800	3,060	4,310	3,410	938	334
5.	302	379	215	225	235	250	1,590	3,270	4,900	2,900	772	307
6.	307	372					312	1,610	3,210	5,210	2,450	681
7.	346	379					296	1,330	3,210	5,230	2,080	614
8.	372	360					329	1,440	3,170	4,760	1,840	566
9.	372	379	235	220	230	225	270	1,470	3,210	4,570	1,720	535
10.	366	379					250	1,330	3,530	4,780	1,680	498
11.	412	372					1,380	4,150	4,620	1,610	498	240
12.	454	398					1,610	4,760	4,760	1,580	490	236
13.	482	340	235	220	230	225	2,100	5,260	4,980	1,520	468	233
14.	440	290					2,730	5,910	5,130	1,540	433	226
15.	405	329					3,550	6,780	5,500	1,410	405	222
16.	366	318					4,740	6,190	6,050	1,240	392	219
17.	340	280	240	220	215	290	4,930	5,830	6,030	1,250	372	216
18.	329	262					4,570	5,940	5,910	1,220	372	208
19.	324	276					3,740	6,190	5,290	1,110	372	198
20.	324	262					3,410	7,280	5,340	1,010	386	194
21.	454	240	250	225	235	433	3,800	8,110	5,210	915	379	191
22.	574	208					4,260	9,110	5,260	842	360	191
23.	490	184					475	3,990	9,290	5,520	852	334
24.	490						490	2,890	7,870	5,500	820	318
25.	454		210	230	270	447	398	2,280	7,340	5,630	772	233
26.	433						574	2,280	6,250	5,420	762	290
27.	398						405	2,300	5,290	5,340	762	207
28.	334						412	2,130	4,400	5,130	744	426
29.	329		270	230	270	468	2,000	4,710	4,690	852	426	233
30.	334						520		4,570		926	398
31.	334											

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	574	276	377	23,200
November	419	184	304	18,100
December			238	14,600
January			226	13,900
February			234	13,500
March	574		340	20,900
April	4,930	744	2,530	151,000
May	9,290	1,940	5,140	316,000
June	6,050	4,100	5,110	304,000
July	4,260	734	1,640	101,000
August	1,250	290	525	32,300
September	392	191	250	14,900
The year	9,290		1,410	1,020,000

\* 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 1932.

EXTREMES.—Maximum discharge during year, 13,500 second-feet May 24 (gauge height, 5.32 feet); minimum occurred during winter.

1913-25, 1929-32: Maximum discharge, 18,800 second-feet June 26, 1917 (gauge height, 6.2 feet); minimum, 72 second-feet Nov. 14, 1922.

REMARKS.—Records excellent except those of discharge below 600 second-feet, which are good, and those for Oct. 1-3, Nov. 25 to Mar. 15, which were based on comparison with flow of North Platte River at Saratoga. Diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	348	358		595	2,600	6,740	6,310	870	515
2	316	332		1,330	2,600	6,740	5,520	932	515
3	294	392	320	2,490	2,710	6,310	5,520	1,120	420
4	272	420		3,180	3,430	5,900	4,840	1,120	392
5	272	420		3,690	4,240	5,900	4,240	995	358
6	276	420		3,430	4,840	7,170	3,430	810	332
7	292	392		2,820	4,840	7,170	2,940	695	308
8	300	392	300	2,380	4,530	7,610	2,380	640	284
9	327	392		1,980	4,530	7,610	2,080	595	272
10	358	392		1,980	4,530	7,170	1,800	550	269
11	480	392		1,710	5,170	6,740	1,710	515	265
12	515	420		1,650	6,310	6,740	1,550	515	258
13	450	392	250	1,800	7,610	6,740	1,550	515	258
14	420	420		2,380	8,520	7,170	1,480	480	255
15	450	363		3,180	9,500	7,170	1,480	480	248
16	420	348	350	4,240	10,000	7,610	1,330	450	245
17	392	317	450	5,900	9,500	8,060	1,200	420	238
18	363	284	450	5,900	8,520	8,200	1,190	420	225
19	353	276	450	6,170	8,520	8,060	1,190	480	218
20	343	245	515	4,530	9,000	7,610	1,120	420	215
21	363	208	550	3,960	10,600	7,610	995	420	215
22	353	186	640	4,530	11,600	7,170	932	420	212
23	450	222	640	5,170	12,800	7,170	870	420	208
24	550	258	595	4,840	12,800	7,610	810	392	218
25	480		595	3,960	11,600	7,610	810	363	225
26	480		595	2,940	11,100	8,060	750	358	218
27	420	270	595	2,710	9,500	7,610	750	358	228
28	420		550	3,060	8,060	7,170	750	348	252
29	420		595	2,940	6,740	7,170	695	343	252
30	358		695	2,820	6,310	6,740	695	450	252
31	348		550		6,740		810	595	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	550	272	383	23,600
November	420	186	329	19,600
December			250	15,400
January			240	14,800
February			265	15,200
March	640		421	25,900
April	5,900	595	3,240	193,000
May	12,800	2,600	7,400	455,000
June	8,200	5,900	7,210	429,000
July	6,310	695	1,990	122,000
August	1,120	343	564	34,700
September	515	208	279	16,600
The year	12,800		1,880	1,360,000

## NORTH PLATTE RIVER BELOW PATHFINDER RESERVOIR, WYO.

LOCATION.—Water-stage recorder in sec. 24, T. 29 N., R. 84 W., a quarter of a mile below Pathfinder Dam.

DRAINAGE AREA.—10,700 square miles.

RECORDS AVAILABLE.—May 1905 to September 1932.

EXTREMES.—Since completion of reservoir, maximum discharge, 18,900 second-feet June 25-27, 1917; no flow Nov. 23, 1928, and Apr. 1 to May 19, 1932.

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, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	May	June	July	Aug.	Sept.
1.....	512	490	40	35	35	7	0	4,640	6,000	5,890	4,500
2.....	467	485	36	35	35	0	0	4,640	6,030	5,730	4,480
3.....	436	147	36	35	35	0	0	5,080	6,020	3,490	4,460
4.....	404	10	36	35	35	0	0	5,330	6,010	3,590	4,430
5.....	364	85	36	35	35	30	0	5,310	6,010	3,590	4,410
6.....	336	43	36	35	35	30	0	5,310	6,010	3,590	4,480
7.....	342	43	36	35	35	30	0	5,320	6,010	3,490	4,460
8.....	376	43	36	35	35	30	0	5,310	6,010	3,490	4,540
9.....	396	43	36	35	35	30	0	5,740	6,010	3,490	3,510
10.....	406	43	35	35	35	30	0	5,720	6,010	3,490	3,950
11.....	449	43	35	35	35	30	0	6,450	6,000	3,470	3,930
12.....	526	43	35	35	35	30	0	6,170	5,990	4,150	3,900
13.....	597	43	35	35	35	30	0	6,210	5,980	4,560	3,890
14.....	620	43	35	35	35	30	0	6,260	5,970	4,570	3,630
15.....	593	43	35	35	35	30	0	6,270	5,960	4,560	3,520
16.....	575	45	35	35	35	30	0	6,060	6,230	5,130	3,500
17.....	571	45	35	35	35	30	0	6,110	6,280	5,200	3,480
18.....	552	45	35	35	35	20	0	6,070	6,260	5,190	3,470
19.....	526	45	35	35	35	10	0	6,170	6,240	5,150	3,460
20.....	498	45	35	35	35	10	70	6,190	6,230	5,110	3,520
21.....	489	45	35	35	35	10	530	5,600	6,220	5,120	3,510
22.....	512	45	35	35	35	10	940	5,490	6,200	5,080	3,490
23.....	539	45	35	35	35	2	960	5,500	6,280	5,050	3,530
24.....	571	45	35	35	35	2	2,080	5,500	6,270	5,090	3,500
25.....	625	45	35	35	35	2	3,200	5,500	6,240	5,030	3,450
26.....	645	45	35	35	35	2	3,780	5,500	6,210	5,090	3,420
27.....	616	45	35	35	35	2	4,250	5,510	6,180	5,090	2,790
28.....	584	45	35	35	35	2	4,180	5,520	6,250	5,190	1,700
29.....	561	45	35	35	35	2	4,170	5,530	6,260	5,170	720
30.....	548	45	35	35	-----	2	4,170	5,500	6,230	4,590	590
31.....	516	-----	35	35	-----	2	4,560	-----	5,920	4,530	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	645	336	508	31,200
November.....	490	10	77.4	4,610
December.....	40	35	35.4	2,180
January.....	35	35	35	2,150
February.....	35	35	35	2,010
March.....	30	0	15.3	941
April.....	0	0	0	0
May.....	4,560	0	1,060	65,200
June.....	6,450	4,640	5,650	336,000
July.....	6,280	5,920	6,110	376,000
August.....	5,800	3,470	4,560	280,000
September.....	4,500	590	3,540	211,000
The year.....	6,450	0	1,810	1,310,000

## NORTH PLATTE RIVER AT CASPER, WYO.

LOCATION.—Chain gage in sec. 4, T. 33 N., R. 79 W., at Casper, 1½ miles below mouth of Casper Creek.

DRAINAGE AREA.—12,500 square miles.

RECORDS AVAILABLE.—May 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 6,460 second-feet June 11 (gage height, 4.58 feet); minimum occurred during winter.

1929-32: Maximum discharge, 13,800 second-feet May 31, 1929; minimum, 57 second-feet May 15, 1931 (gage height, 0.21 foot).

REMARKS.—Records good except those for period Nov. 15 to Mar. 19, which were based on two discharge measurements and temperature records. Flow regulated by Pathfinder Reservoir. Gage-height record furnished by Standard Oil Co. of Indiana.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	900	590				102	190	5,070	6,040	5,620	4,440
2	745	581				167	335	5,070	6,040	5,620	4,440
3	695	496			125	221	383	5,430	6,040	3,530	4,440
4	648	226				226	514	5,670	6,040	3,530	4,440
5	552	170				190	441	5,430	6,040	3,530	4,440
6	524	135				178	381	5,630	6,040	3,530	4,440
7	505	148				174	433	5,430	6,040	3,530	4,440
8	524	135			100	154	375	5,430	6,040	3,530	4,630
9	543	138				148	300	5,830	6,040	3,530	4,250
10	600	138				144	248	5,830	6,040	3,530	4,070
11	695	144				133	243	6,460	6,040	3,530	4,070
12	745	141				125	265	6,070	6,040	4,070	4,070
13	955	141				128	265	6,250	6,040	4,630	4,070
14	1,010	135				141	272	6,270	6,040	4,630	3,530
15	955	138				164	265	6,270	6,040	4,630	3,710
16	848		" 98			182	248	6,070	6,040	5,220	3,530
17	900			" 104		178	174	6,070	6,040	5,220	3,530
18	848	120			150	221	144	6,070	6,040	5,220	3,530
19	795					194	138	6,070	6,040	5,220	3,530
20	745				194	170	144	6,070	6,040	5,020	3,530
21	695					198	174	5,630	6,040	5,220	3,530
22	1,130					157	232	1,070	5,630	6,040	5,020
23	534	110				133	300	1,440	5,630	6,250	5,020
24	695					120	286	3,010	5,630	6,250	5,020
25	695					117	194	3,350	5,630	6,250	5,020
26	795					112	194	3,890	5,630	6,040	5,020
27	745					104	272	4,440	5,630	6,040	5,020
28	695					102	254	4,440	5,630	6,250	5,020
29	695	115				106	238	4,630	5,630	6,250	5,220
30	695					110	202	4,630	5,630	6,040	4,630
31	648					110		5,020	5,830	4,630	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,130	505	734	45,100
November	590		173	10,300
December			110	6,760
January			100	6,150
February			110	6,330
March	198		125	7,690
April	300	102	190	11,300
May	5,020	138	1,350	83,000
June	6,460	5,020	5,740	342,000
July	6,250	5,830	6,070	373,000
August	5,620	3,530	4,570	281,000
September	4,630	745	3,630	216,000
The year	6,460		1,910	1,390,000

• Result of discharge measurement.



## NORTH PLATTE RIVER AT DOUGLAS, WYO.

LOCATION.—Water-stage recorder in sec. 8, T. 32 N., R. 71 W., half a mile north-west of Douglas. Prior to Apr. 28, 1932, chain gage 50 feet upstream was used.

DRAINAGE AREA.—14,200 square miles.

RECORDS AVAILABLE.—May 1891 to September 1894; April 1919 to September 1923; April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 5,920 second-feet June 27 (gage height, 5.14 feet); minimum occurred during winter.

1891-94, 1919-23, 1929-32: Maximum discharge, 16,600 second-feet Sept. 28, 1923; minimum, 95 second-feet Apr. 1, 4, 1923.

REMARKS.—Records good except those for Nov. 21 to Mar. 19, which were based on two discharge measurements and temperature records. Flow regulated by Pathfinder Reservoir.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	740	716			250	210	596	4,100	5,290	5,500	4,290
2	704	668				187	596	4,290	5,710	5,500	4,290
3	668	668				182	860	4,290	5,710	5,290	4,290
4	644	632				268	1,420	5,090	5,710	3,730	4,290
5	584	440				368	1,630	4,890	5,710	3,550	4,290
6	572	300			180	392	1,630	4,890	5,710	3,780	4,290
7	490	235				384	1,700	4,890	5,710	3,780	4,290
8	480	235				344	1,560	4,890	5,710	3,380	4,290
9	460	210				314	1,490	4,890	5,500	3,780	4,290
10	490	220				288	1,420	4,890	5,500	3,380	3,380
11	500	225			190	250	1,490	4,890	5,500	3,380	3,730
12	524	225				230	1,560	4,890	5,500	3,380	4,100
13	584	215				250	1,630	5,500	5,500	3,910	3,730
14	692	196				240	1,630	5,500	5,500	4,290	3,730
15	1,230	215				294	1,700	5,710	5,500	4,290	3,550
16	1,230	210			320	536	1,700	5,500	5,500	4,490	3,550
17	1,230	192				668	1,360	5,500	5,710	5,090	3,550
18	800	196	a 159	a 189		800	1,160	5,500	5,710	4,890	3,550
19	728	210				728	1,040	5,710	5,710	4,890	3,380
20	740	192				336	668	980	5,710	4,890	3,550
21	1,490				352	800	980	5,710	5,710	4,890	3,550
22	1,420					376	1,040	920	5,290	5,710	4,890
23	1,360					328	1,100	1,100	5,290	5,710	4,890
24	980					262	1,160	1,490	5,290	5,710	4,890
25	692					262	980	1,920	5,290	5,920	4,890
26	740				235	860	2,870	5,290	5,710	4,890	3,550
27	860					220	800	3,380	5,500	5,710	4,890
28	800					210	800	3,730	5,500	5,710	4,890
29	740					200	740	3,910	5,290	5,920	4,890
30	740					200	656	3,910	5,290	5,920	4,890
31	740				210		3,910		5,710	4,690	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,490	460	795	48,900
November	716		270	16,100
December			170	10,500
January			155	9,530
February			190	10,900
March	376		244	15,000
April	1,160	182	551	32,800
May	3,910	596	1,780	109,000
June	5,710	4,100	5,180	308,000
July	5,920	5,290	5,660	348,000
August	5,500	3,380	4,440	273,000
September	4,290	1,040	3,670	218,000
The year	5,920		1,930	1,400,000

\* Result of discharge measurement.

## 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 1932.

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, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	323	604	220	296	195	258	226	1,010	4,490	6,050	5,330	4,770
2	301	736	235	180	226	253	222	1,150	4,420	6,080	4,730	4,620
3	285	852	225	226	242	237	285	1,270	4,470	6,100	3,240	4,550
4	275	905	220	200	185	206	170	1,280	4,470	6,620	3,510	4,530
5	270	852	265	170	200	226	232	1,140	4,360	6,620	3,400	4,530
6	334	913	260	258	200	211	302	1,020	4,490	6,230	3,420	4,530
7	265	913	235	200	195	206	258	947	4,890	6,210	3,460	4,530
8	240	905	270	242	170	242	264	1,000	5,260	6,080	3,490	4,510
9	250	905	260	206	190	258	369	1,070	5,470	6,100	3,490	4,510
10	285	454	275	232	211	258	513	1,040	5,870	6,130	3,510	4,510
11	235	394	235	206	185	216	551	1,060	5,950	6,130	3,730	4,510
12	195	406	301	237	206	232	669	1,080	5,950	6,100	3,970	4,440
13	496	406	235	258	211	232	772	1,160	5,670	6,310	4,270	4,250
14	754	418	250	335	226	160	786	1,280	5,550	6,340	4,530	4,090
15	610	394	323	264	206	211	891	1,910	5,700	5,980	4,910	4,030
16	574	367	285	242	253	216	939	1,990	5,590	5,900	5,000	3,830
17	622	412	240	226	253	226	931	1,980	5,020	5,850	5,050	3,640
18	694	318	255	211	216	258	923	2,090	4,970	5,880	4,890	3,600
19	724	312	240	242	232	226	923	2,170	4,870	5,900	4,930	3,580
20	809	250	230	264	216	307	987	2,380	4,620	5,920	5,050	3,550
21	845	235	230	242	195	190	987	2,330	4,670	5,780	5,050	3,640
22	788	334	240	242	160	226	1,000	2,940	4,580	5,700	5,050	3,710
23	823	301	240	253	216	264	995	3,100	4,670	5,650	5,050	3,600
24	827	312	210	269	195	247	1,020	3,350	4,870	5,620	5,040	3,490
25	845	200	210	242	180	247	1,010	3,870	5,020	5,500	5,070	3,380
26	845	180	180	291	190	242	1,000	4,090	5,310	5,600	5,020	3,220
27	502	240	190	296	206	296	995	4,380	5,530	5,550	4,960	2,960
28	436	220	185	274	222	175	995	4,490	5,870	5,480	4,890	2,680
29	384	220	240	302	170	264	995	4,530	5,920	5,450	4,820	2,390
30	520	175	230	291	---	302	995	4,550	6,050	5,410	4,960	1,830
31	580	---	210	302	---	155	---	4,550	---	5,380	4,820	---

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	845	195	514	31,600
November	913	175	471	28,000
December	323	180	239	14,700
January	335	170	248	15,200
February	253	160	205	11,800
March	307	155	234	14,400
April	1,020	170	706	42,000
May	4,550	947	2,280	140,000
June	6,050	4,360	5,140	306,000
July	6,620	5,980	5,920	364,000
August	5,330	3,240	4,470	275,000
September	4,770	1,830	3,870	230,000
The year	6,020	155	2,030	1,470,000

## 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 1932.

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, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	30	35	137	30	95	94	44	1,880	2,570	1,750	1,430
2	30	30	78	20	60	94	52	44	1,830	2,590	2,240	1,360
3	30	30	58	75	72	76	97	44	1,820	2,600	1,830	1,310
4	30	30	65	42	24	58	40	44	1,810	3,120	1,740	1,280
5	30	30	61	20	58	70	90	44	1,640	3,110	1,510	1,280
6	30	30	81	115	71	50	150	44	1,740	2,660	1,540	1,270
7	30	30	73	46	54	69	39	44	1,910	2,640	1,470	1,270
8	30	30	85	95	59	96	45	52	2,120	2,490	1,420	1,270
9	30	30	72	49	69	111	59	52	2,180	2,510	1,430	1,250
10	30	30	84	120	120	72	64	51	2,540	2,520	1,440	1,240
11	30	30	63	70	84	50	64	51	2,690	2,520	1,570	1,250
12	30	30	98	75	105	72	64	64	2,670	2,480	1,560	1,230
13	30	30	74	139	77	75	64	88	2,310	2,670	1,610	1,070
14	168	30	67	194	99	36	64	187	2,220	2,710	1,580	940
15	30	30	105	92	82	51	64	759	2,350	2,340	1,660	865
16	30	30	102	75	88	95	63	854	2,230	2,310	1,630	686
17	30	30	70	68	114	182	45	642	1,920	2,270	1,630	525
18	30	30	76	59	53	180	36	705	2,020	2,300	1,420	459
19	30	30	75	86	82	146	35	595	2,080	2,330	1,420	451
20	30	75	62	120	63	225	81	725	1,920	2,310	1,540	475
21	30	65	57	80	54	63	37	975	1,970	2,160	1,520	584
22	30	99	70	88	45	142	41	1,010	1,940	2,070	1,510	585
23	30	178	60	105	62	185	31	1,070	2,010	2,030	1,510	701
24	30	101	48	108	42	187	40	1,190	2,000	1,990	1,520	667
25	30	153	57	92	42	165	41	1,570	2,030	1,880	1,530	662
26	30	48	49	129	43	173	40	1,590	2,120	2,000	1,500	634
27	199	58	46	131	72	214	40	1,820	2,180	1,940	1,480	583
28	71	49	51	110	77	71	40	1,900	2,560	1,880	1,440	460
29	30	60	70	141	34	177	40	1,950	2,510	1,830	1,330	415
30	30	49	65	107	-----	120	40	1,940	2,630	1,810	1,480	428
31	30	-----	37	137	-----	14	-----	1,930	-----	1,800	1,400	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	199	30	41.5	2,550
November	178	30	50.2	2,990
December	105	35	67.5	4,150
January	194	20	94.4	5,800
February	120	24	66.7	3,840
March	225	14	110	6,760
April	150	31	56.7	3,370
May	1,950	44	713	43,800
June	2,690	1,640	2,130	127,000
July	3,120	1,800	2,340	144,000
August	2,240	1,330	1,550	95,300
September	1,430	415	891	53,000
The year	3,120	14	678	493,000

## NORTH PLATTE RIVER AT TORRINGTON, WYO.

LOCATION.—Water-stage recorder in sec. 15, T. 24 N., R. 61 W., at Torrington.

Prior to Apr. 20, 1932, staff gage at same location was used.

DRAINAGE AREA.—21,700 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932. Records for April 1926 to September 1930 published by State engineer of Nebraska.

EXTREMES.—Maximum discharge during year, 3,150 second-feet July 4 (gage height, 1.84 feet); minimum, 226 second-feet Mar. 9 (discharge measurement). 1926-32: Maximum discharge, 14,200 second-feet June 2, 1929; minimum, that of Mar. 9, 1932.

REMARKS.—Records good except those for Nov. 1 to Apr. 19, which were based on eight discharge measurements and temperature records. Small diversions for irrigation above station. Flow regulated by Pathfinder and Guernsey Reservoirs.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	556							323	2,020	2,590	1,740	1,540
2	556	330						323	2,000	2,670	2,470	1,470
3	658		410	410	300	410	480	269	1,920	2,770	2,180	1,470
4	658							287	1,860	3,070	1,870	1,420
5	532	*347						383	1,700	2,970	1,800	1,410
6	508			*380			*632	438	1,780	2,610	1,760	1,380
7	556				450	250		460	1,800	2,490	1,740	1,360
8	556	300	400	380		*226	520	460	1,900	2,370	1,730	1,330
9	556				*490	250		449	1,900	2,340	1,710	1,330
10	532							449	2,120	2,280	1,640	1,330
11	556							416	2,370	2,300	1,730	1,340
12	532							416	2,480	2,320	1,670	1,360
13	416	280	330	310	410	320	330	405	2,350	2,470	1,680	1,310
14	416							405	2,200	2,510	1,620	1,280
15	460							556	2,200	2,320	1,590	1,120
16	496					330		794	2,200	2,280	1,580	1,100
17	405					*502	310	822	1,900	2,200	1,600	1,060
18	405	300	360	390				794	1,900	2,140	1,540	945
19	383				420	330		752	2,000	2,110	1,650	872
20	361						305	790	1,900	2,140	1,590	816
21	383						323	766	1,900	2,110	1,600	816
22	383						296	970	1,900	2,010	1,600	872
23	341	310	380	400	*441	400	296	1,020	2,000	2,030	1,550	945
24	323				420		372	1,190	2,000	1,990	1,590	945
25	323				420		383	1,420	2,130	1,910	1,570	990
26	372			420			383	1,570	2,160	1,920	1,520	975
27	394			*453	430		323	1,680	2,200	1,890	1,540	975
28	580	310	360				350	1,700	2,400	1,850	1,500	886
29	372			420			383	1,700	2,400	1,800	1,490	858
30	350						361	1,920	2,600	1,780	1,520	900
31	350							1,960		1,760	1,540	
Month	Maximum							Minimum		Mean		Run-off in acre-feet
October	658							323		460		28,300
November										306		18,200
December										373		22,900
January										386		23,700
February										406		23,400
March										372		22,900
April								383		393		23,400
May								1,960		835		51,300
June								2,610		1,740		125,000
July								3,070		1,760		139,000
August								2,470		1,490		103,000
September								1,540		816		68,400
The year								3,070		893		650,000

\* 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, Neb.

DRAINAGE AREA.—22,100 square miles.

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 2,740 second-feet July 5 (gage height, 2.72 feet); minimum, 238 second-feet Jan. 13 (gage height, 1.02 feet).

1929-32: Maximum discharge, 17,900 second-feet June 2, 1929 (gage height, 6.04 feet); minimum, 209 second-feet Mar. 27, 1931.

REMARKS.—Records good except those for Dec. 4 to Feb. 8, Mar. 6-14, which were based on four discharge measurements and temperature records. Large diversions for irrigation between Torrington and this station. Flow regulated by Pathfinder and Guernsey Reservoirs.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	544	440	445	450	260	469	413	350	1,840	2,210	1,670	1,500
2	519	429	461	460	350	461	429	344	1,770	2,260	2,080	1,450
3	510	427	461	465	350	469	445	318	1,740	2,320	2,160	1,400
4	510	424	477	470	300	445	589	284	1,670	2,600	1,720	1,360
5	502	421	475	494	370	400	627	454	1,550	2,680	1,670	1,310
6	519	415	470	461	400	380	562	614	1,500	2,550	1,600	1,290
7	570	410	470	445	450	340	536	518	1,520	2,430	1,500	1,310
8	589	405	475	437	500	280	536	496	1,650	2,300	1,460	1,280
9	553	398	480	453	536	250	580	474	1,720	2,250	1,500	1,280
10	519	361	470	485	536	250	477	468	1,910	2,160	1,500	1,290
11	528	383	460	400	519	280	421	427	2,100	2,140	1,620	1,310
12	528	383	390	350	502	320	429	427	2,190	2,120	1,580	1,340
13	502	319	360	288	519	360	368	420	2,100	2,250	1,870	1,290
14	469	332	340	400	267	410	300	427	1,960	2,380	1,520	1,210
15	485	376	350	410	376	461	286	474	2,010	2,160	1,530	1,060
16	485	361	380	420	437	477	318	731	2,080	2,170	1,520	1,000
17	453	354	410	430	453	485	329	790	1,840	2,170	1,480	974
18	421	347	420	450	469	485	344	750	1,790	2,230	1,410	820
19	413	405	430	450	437	461	350	722	1,980	2,230	1,330	740
20	413	405	435	440	445	461	339	988	1,890	2,210	1,360	722
21	390	405	435	435	437	469	318	1,040	1,870	2,120	1,400	640
22	398	405	430	435	461	437	324	1,030	1,820	2,030	1,410	740
23	413	350	440	437	461	437	329	1,060	1,750	2,010	1,400	852
24	383	320	440	470	461	413	384	1,090	1,680	1,960	1,410	876
25	383	300	410	502	469	413	408	1,210	1,670	1,890	1,520	988
26	469	320	360	469	502	398	408	1,430	1,750	1,840	1,530	912
27	445	340	370	461	485	398	372	1,550	1,870	1,820	1,550	900
28	477	360	400	470	461	429	365	1,650	2,100	1,770	1,870	852
29	485	380	420	462	461	445	408	1,680	2,120	1,750	1,480	810
30	502	390	440	492	445	396	1,800	2,210	1,750	1,750	1,480	830
31	461	445	405	445	445	445	1,860	1,860	1,740	1,740	1,550	830

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	589	383	479	29,500
November	440	300	379	22,600
December	480	340	427	26,300
January	502	238	440	27,100
February	536	260	437	25,100
March	485	250	409	25,100
April	627	286	413	24,600
May	1,860	284	835	51,300
June	2,210	1,500	1,860	111,000
July	2,680	1,740	2,150	132,000
August	2,160	1,330	1,550	95,300
September	1,500	640	1,080	64,300
The year	2,680	238	873	634,000

## NORTH PLATTE RIVER AT MITCHELL, NEBR.

LOCATION.—Water-stage recorder in sec. 27, T. 23 N., R. 5<sup>c</sup> W., half a mile south of Mitchell.

DRAINAGE AREA.—24,300 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932. June 1901 to July 1913 at station near Mitchell. April 1916 to September 1930 published by State engineer.

EXTREMES.—Maximum discharge during year, 2,160 second-feet Aug. 3 (gage height, 1.83 feet); minimum, 185 second-feet Oct. 3, 4 (gage height, 0.58 foot). 1901–13, 1916–32: Maximum discharge, 23,600 second-feet June 17, 1921; minimum, that of Sept. 26, Oct. 3, 4, 1932.

REMARKS.—Records good except those for Nov. 21 to Dec. 5, Jan. 13 to Feb. 9, and Mar. 6–15, which were based on one discharge measurement and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder and Guernsey Reservoirs.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	201	760		630		760	741	518	1,070	1,030	936	635
2.....	181	648		648		686	550	458	952	1,030	1,480	620
3.....	185	667	800	667	550	667	532	408	793	1,030	1,940	522
4.....	185	722		686		778	630	358	681	1,130	1,090	444
5.....	197	741		667		686	874	420	614	1,390	815	384
6.....	358	741	850	630		648	1,090	1,030	470	1,410	680	352
7.....	566	722	900	614	1,000		990	932	452	1,210	578	336
8.....	741	704	932	614		600	971	778	518	1,080	494	328
9.....	778	648	912	534			1,050	796	681	1,030	444	320
10.....	741	614	854	630	908		912	722	952	984	444	328
11.....	667	598	834	598	815		760	704	1,030	1,020	456	344
12.....	778	598	815	630	778		686	534	1,270	984	536	384
13.....	874	598	815		778	650	667	432	1,270	920	490	396
14.....	834	598	741	650	778		598	328	1,080	1,140	456	396
15.....	815	630	722		778		566	302	952	1,180	456	384
16.....	722	648	686		778	700	534	311	1,320	1,080	456	352
17.....	741	648	741		778	815	534	320	1,110	984	468	352
18.....	815	648	741	700	778	760	518	311	1,030	968	468	360
19.....	796	704	741		796	778	518	311	1,100	1,000	444	352
20.....	796	778	741		815	834	502	345	1,270	968	384	352
21.....	834		704		796	874	486	1,110	1,240	936	352	344
22.....	760		704		815	874	486	502	1,160	815	352	328
23.....	778	650	741	700	815	834	550	470	1,030	740	352	320
24.....	741		741		778	815	704	311	830	830	384	336
25.....	704		741		796	815	667	302	692	815	578	420
26.....	722		704		815	815	598	382	564	770	522	494
27.....	614		704		815	796	534	470	508	740	550	468
28.....	704	800	686	715	778	796	550	741	665	695	620	420
29.....	874		667		722	834	630	874	830	785	665	480
30.....	874		722	600		760	598	952	905	785	635	890
31.....	796		686	500		778		1,110		890	680	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	874	181	657	40,400
November.....		598	639	41,000
December.....	932	667	769	47,300
January.....			660	40,600
February.....			781	44,900
March.....	874		734	45,100
April.....	1,090	436	669	39,800
May.....	1,110	302	566	34,800
June.....	1,320	458	894	53,200
July.....	1,410	695	980	60,300
August.....	1,940	352	618	38,000
September.....	890	320	415	24,700
The year.....	1,940	181	703	510,000

## NORTH PLATTE RIVER NEAR MINATARE, NEBR.

LOCATION.—Water-stage recorder on west line of sec. 18, T. 21 N., R. 53 W., 2 miles south of Minatare. Prior to Apr. 12, 1932, staff gage at same location was used.

DRAINAGE AREA.—24,700 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932. Records May 1916 to September 1930 published by State engineer.

EXTREMES.—Maximum discharge during year, 2,130 second-feet Aug. 3 (gage height, 1.63 feet); minimum, 295 second-feet May 20 (gage height, 0.69 foot). 1916-32: Maximum discharge of 1921 not recorded; minimum, 147 second-feet May 27, 1931 (gage height, 0.60 foot).

REMARKS.—Records good except those for Nov. 1 to Apr. 11, which were based on eight discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder and Guernsey Reservoirs.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.					
1.	538	1,030	1,000	860	660	1,150	940	895	1,150	850	836	890					
2.	538						910	914	1,130	980	1,130	766					
3.	819						1,030	1,060	1,040	1,500	1,500	664					
4.	599												820	857	800	1,250	664
5.	599	1,030					979	857	698	1,490	944	664					
6.	615	1,060	1,120	960	990	1,150	1,040	1,210	664	1,390	818	647					
7.	1,030						1,260	1,170	555	1,450	715	600					
8.	1,320						1,060	1,010	990	710	1,160	876	495	1,240	664	555	
9.	1,280										1,140	876	480	1,090	630	555	
10.	1,340		1,120	960			1,220	962	480	1,110	615	615					
11.	1,230	1,040	1,020	690	1,200	780	1,080	890	647	940	570	698					
12.	1,280						933	854	1,020	990	600	732					
13.	1,230				1,040			850		857	715	1,130	944	664	715		
14.	1,230									647	698	1,150	1,110	615	681		
15.	1,150						599	647	944	1,310	570	664					
16.	1,230	1,020	940	780	820	1,011	630	570	1,250	1,250	525	630					
17.	1,230						615	570	1,410	1,350	540	615					
18.	1,230						1,020					681	540	1,270	1,250	540	600
19.	1,150											957	664	1,230	1,210	570	630
20.	1,070					1,010	698	376	1,370	1,150	540	585					
21.	1,070	780	940	790	900	1,000	732	698	1,370	1,060	495	555					
22.	1,130						732	600	1,290	980	480	540					
23.	1,190						780					1,050	570	1,210	908	480	600
24.	1,130											1,280	540	1,020	999	467	630
25.	1,110				1,010		1,110	495	818	1,020	732	783					
26.	1,090	900	930	760	1,080	980	990	415	908	962	783	854					
27.	1,130						971	402	732	836	854	836					
28.	1,010						900					1,030	540	766	681	890	890
29.	1,050											990	749	818	818	999	962
30.	1,090			760			971	800	840	872	925	1,090					
31.	1,130			760				1,130		926	944						

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.	1,340	538	1,060	65,200
November.			972	57,800
December.			995	61,200
January.			819	50,400
February.			925	53,200
March.			938	57,700
April.	1,280	599	916	54,500
May.	1,210	376	735	45,200
June.	1,410	480	957	56,900
July.	1,490	681	1,080	66,400
August.	1,890	467	759	46,700
September.	1,090	540	696	41,400
The year.	1,890	376	904	657,000

## 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; October 1930 to September 1932. Records October 1915 to September 1930 published by State engineer.

EXTREMES.—Maximum discharge during year, 2,200 second-feet Aug. 5 (gauge height, 6.14 feet); minimum, 452 second-feet June 8 (gauge height, 5.41 feet).

1902-6, 1915-32: Maximum discharge, 23,000 second-feet June 19, 1921.

REMARKS.—Records good except those for Nov. 21 to Mar. 17, which were based on four discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder and Guernsey Reservoirs.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	923	1,500	1,300	1,200	670	1,500	1,160	1,060	1,400	1,230	1,270	1,180
2.	980	1,500			750	1,500	1,160	1,060	1,200	1,230	1,270	1,160
3.	980	1,470			900	1,610	1,080	1,020	1,040	1,270	1,500	1,080
4.	980	1,450			950	1,730	1,060	960	960	1,400	1,980	1,080
5.	980	1,430			1,050	1,610	1,060	960	849	1,360	1,610	1,140
6.	960	1,430	1,450	1,440 1,500	1,200	900	1,080	1,020	812	1,430	1,060	1,040
7.	1,100	1,430			1,350		1,160	1,520	722	1,270	960	942
8.	1,730	1,430			1,490		1,160	1,470	568	1,200	812	904
9.	1,730	1,430			1,490		1,160	1,250	552	1,040	775	849
10.	1,710	1,430			1,350		1,160	1,140	520	886	705	758
11.	1,560	1,470	1,350		1,100	950	1,160	1,020	520	812	688	830
12.	1,520	1,500					1,140	960	688	775	722	923
13.	1,610	1,500					1,120	960	868	812	1,120	1,020
14.	1,610	1,470					1,040	960	1,000	849	1,100	960
15.	1,610	1,450					980	886	960	1,000	923	960
16.	1,660	1,430			1,150	1,000	960	740	1,000	1,380	830	960
17.	1,660	1,430				1,500	868	670	1,380	1,310	830	960
18.	1,710	1,360				1,270	1,040	688	1,610	1,380	775	980
19.	1,590	1,310				1,160	1,060	812	1,750	1,310	794	1,000
20.	1,470	1,310				1,160	1,060	923	1,800	1,230	794	980
21.	1,520	950	1,250	1,000	1,200	1,060	1,060	1,180	1,850	1,100	794	960
22.	1,520			1,270		1,060	1,060	1,900	960	886	980	
23.	1,520			1,160		1,380	868	1,900	923	849	1,040	
24.	1,520			1,160		1,730	794	1,180	1,100	794	1,060	
25.	1,520			1,380		1,540	812	1,060	1,060	794	1,270	
26.	1,520	1,150			1,380	1,160	1,310	635	980	1,000	1,080	1,380
27.	1,470				1,380	1,160	1,160	618	886	960	1,140	1,480
28.	1,360				1,380	1,160	1,230	830	794	960	1,430	1,450
29.	1,430				1,380	1,160	1,200	1,120	980	1,100	1,450	1,450
30.	1,540				1,160	1,060	1,250	1,250	1,160	1,180	1,380	1,450
31.	1,540					1,160		1,360		1,230	1,250	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,730	923	1,440	88,500
November	1,500		1,310	78,000
December			1,310	80,600
January			1,080	66,400
February			1,180	67,900
March	1,730		1,160	71,300
April	1,730	868	1,150	68,400
May	1,520	618	987	60,700
June	1,900	520	1,100	55,500
July	1,430	775	1,120	68,900
August	1,980	688	1,040	64,000
September	1,450	758	1,070	63,700
The year	1,980	520	1,160	844,000



## 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. Prior to May 4, 1932, staff gage at same location was used.

RECORDS AVAILABLE.—September 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 2,120 second-feet Jun 3 18 (gage height, 2.12 feet); minimum, 360 second-feet June 9 (gage height, 1.13 feet).

REMARKS.—Records good except those for Nov. 21 to Mar. 18, which were based on three discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder Reservoir.

## Discharge, in second-feet, 1931-32

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		822	1,660					1,160	1,270	1,230	871	1,400	1,180
2		904	1,590					1,120	1,180	1,340	970	1,320	1,160
3		1,020	1,590	1,600	1,100	800	1,800	970	1,140	1,180	1,110	1,300	1,120
4		1,070	1,450					1,110	1,070	987	1,110	1,380	1,110
5		1,140	1,470					1,070	1,110	805	1,060	1,780	1,090
6		1,060	1,550					1,180	1,090	725	1,040	1,360	1,090
7		1,060	1,550					1,250	1,160	741	1,340	871	1,020
8	741	1,140	1,550	1,700	1,500	1,500	750	1,360	1,780	552	1,190	725	937
9	709	1,700	1,600					1,450	1,620	403	1,060	645	888
10	536	1,820	1,510					1,340	1,270	461	904	552	805
11		521	1,800	1,590		1,840		1,360	1,250	490	757	568	789
12		536	1,800	1,620				1,230	1,000	677	805	645	904
13		536	1,800	1,590	1,500	1,170	900	1,140	970	725	904	1,000	954
14		552	1,900	1,590	1,100			1,040	888	1,000	937	1,090	970
15		568	1,820	1,470				1,060	888	1,060	954	954	987
16		709	1,740	1,510			1,300	1,090	822	1,140	1,380	789	1,000
17		693	1,590	1,530			1,850	937	709	1,230	1,420	709	987
18		725	1,640	1,470	1,100		1,800	1,020	661	1,600	1,340	661	970
19		838	1,780	1,500			1,760	987	838	1,920	1,320	970	1,060
20		937	1,820	1,550		1,300	1,640	970	838	1,740	1,270	854	1,060
21		871	1,700				1,640	970	789	1,700	1,120	773	1,020
22		838	1,640				1,700	757	920	1,700	1,140	773	937
23		888	1,780	950	1,350	1,050	1,360	1,470	1,060	1,620	1,160	805	954
24	1,020	1,600					1,420	1,820	838	1,450	1,530	677	1,000
25	1,110	1,600					1,380	2,000	805	1,190	1,270	693	1,140
26	1,020	1,510					1,320	1,740	630	1,020	1,180	789	1,360
27	1,000	1,470				1,700	1,280	1,250	536	937	1,140	1,120	1,400
28	1,060	1,530	1,400				1,320	1,280	614	970	1,090	1,270	1,380
29	904	1,430			1,030		1,210	1,470	773	822	1,090	1,430	1,300
30	904	1,430					1,160	1,320	987	838	1,270	1,360	1,340
31		1,590					1,160		1,040		1,380	1,230	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931				
September 8-30	1,110	521	792	36,100
1931-32				
October	1,900	822	1,510	92,800
November	1,660		1,420	84,500
December			1,470	90,400
January			1,170	71,900
February			1,280	73,600
March			1,310	80,600
April	2,000	757	1,230	73,200
May	1,780	536	989	60,800
June	1,920	403	1,080	64,300
July	1,530	757	1,130	69,500
August	1,780	552	984	60,500
September	1,400	789	1,060	63,100
The year	2,000		1,220	885,000

## NORTH PLATTE RIVER AT OSHKOSH, NEBR.

LOCATION.—Staff gage on west line of sec. 2, T. 16 N., R. 44 W., 1 mile south of Oshkosh.

DRAINAGE AREA.—27,500 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932. Records April 1916 to October 1917 and March 1928 to September 1930 published by State engineer.

EXTREMES.—Maximum discharge during year, 2,400 second-feet Apr. 23 (gage height, 2.22 feet); minimum, 556 second-feet June 10 (gage height, 1.26 feet). 1916-17, 1928-32: Maximum discharge, 19,200 second-feet June 4, 1929; minimum, 253 second-feet July 21, 1931 (gage height, 1.12 feet).

REMARKS.—Records good except those for Nov. 20 to Mar. 15, which were based on six discharge measurements and temperature records. Numerous diversions for irrigation. Flow partly regulated by Pathfinder Reservoir.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	820	1,690	1,610	1,100	815	1,830	1,610	1,200	1,130	944	1,240	1,150
2	820	1,610					1,570	1,180	1,360	960	1,260	1,180
3	928	1,700					1,570	1,110	1,260	1,080	1,150	1,150
4	1,040	1,460					1,570	1,040	1,110	1,130	1,130	1,060
5	1,040	1,490					1,570	1,040	976	1,340	1,480	1,080
6	944	1,580	1,700	1,510	1,530	770	1,550	1,060	835	1,220	1,740	1,060
7	1,020	1,580					1,570	1,110	760	1,260	1,180	1,010
8	1,110	1,570					1,810	1,680	639	1,340	912	912
9	1,550	1,610					1,740	1,590	578	1,200	820	835
10	1,810	1,510					1,740	1,340	805	1,110	691	865
11	1,810	1,400	1,500	1,110	1,180	1,050	1,810	1,200	626	896	600	896
12	1,810	1,630					1,790	1,170	691	790	613	865
13	1,810	1,600					1,590	1,060	600	820	944	912
14	1,810	1,610					1,480	1,080	835	960	1,010	928
15	1,700	1,500					1,300	928	960	850	976	912
16	1,740	1,520	1,370	1,120	1,320	1,350	1,220	992	992	1,180	912	928
17	1,630	1,540				1,870	1,150	912	1,240	1,460	790	976
18	1,630	1,480				1,900	1,090	820	1,220	1,380	745	912
19	1,680	1,500				2,060	1,150	912	1,980	1,380	992	865
20	1,630	1,550				1,690	1,060	976	1,840	1,300	912	928
21	1,630	1,000	1,360	1,060	1,400	1,680	1,060	850	1,720	1,170	928	820
22	1,630				1,600	1,740	1,080	1,300	1,640	1,130	912	835
23	1,630				2,000	1,860	2,220	976	1,790	1,170	960	928
24	1,680				1,900	1,460	2,200	775	1,630	1,680	835	992
25	1,570				1,200	1,880	1,420	1,220	1,320	1,320	760	1,060
26	1,550	1,420	1,360	1,040	1,760	1,360	1,790	775	1,040	1,180	850	1,170
27	1,550					1,630	1,420	691	992	1,130	976	1,240
28	1,550					1,630	1,570	760	1,170	1,020	1,240	1,240
29	1,440					1,630	1,460	820	976	1,090	1,360	1,180
30	1,440					1,630	1,260	960	835	1,130	1,380	1,220
31	1,700					1,630		992		1,260	1,320	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,810	820	1,470	90,400
November	1,700		1,440	85,700
December			1,480	91,000
January			1,230	75,600
February			1,380	79,400
March			1,440	88,500
April	2,220	1,060	1,540	91,600
May	1,680	691	1,050	64,600
June	1,980	578	1,120	66,600
July	1,680	790	1,160	71,300
August	1,740	600	1,020	62,700
September	1,240	820	1,000	59,500
The year	2,220		1,280	927,000

## 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 1932. Records October 1915 to September 1930 published by State engineer.

EXTREMES.—Maximum discharge during year, 6,320 second-feet Mar. 19 (gage height, 4.36 feet); minimum, 407 second-feet May 25 (gage height, 2.50 feet).

1895-1932: Maximum discharge, 27,100 second-feet June 6, 1909; minimum, 20 second-feet Sept. 20, 1904.

REMARKS.—Records good except those for Nov. 29 to Mar. 12, which were based on five discharge measurements and temperature records. Numerous diversions for irrigation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,060	1,730		2,370			1,680	2,030	1,390	868	1,200	1,200
2	1,040	1,840		2,240			1,530	1,940	980	855	995	1,270
3	1,090	1,950	1,910	1,680	1,600	3,200	1,510	1,730	1,110	816	995	1,210
4	1,110	2,040		1,460			1,530	1,650	1,040	732	965	1,140
5	1,070	2,010		1,650			1,560	1,560	1,090	767	995	1,200
6	1,140	2,040		1,830			1,560	1,460	1,020	767	894	1,160
7	1,210	2,040		1,800			1,530	1,370	829	790	920	1,140
8	1,230	2,010	2,100	1,800	2,200	1,500	1,510	1,340	744	881	1,180	1,110
9	1,230	2,010		1,700			1,600	1,290	675	1,040	1,330	1,070
10	1,270	1,980		1,850			1,980	1,260	602	995	950	1,040
11	1,360	1,920		1,800		1,680	1,900	1,740	881	950	686	1,020
12	1,950	1,870		1,900		1,750	1,810	1,650	1,110	816	542	1,060
13	2,140	1,900	1,800	1,650	1,750	1,810	1,760	1,650	1,120	612	744	1,010
14	1,920	1,980		1,760		1,950	1,650	1,320	995	522	1,140	1,010
15	1,980	1,980		1,500		2,740	1,600	990	881	432	1,330	965
16	1,980	1,980	1,870		1,900	4,490	1,580	850	790	560	1,060	980
17	1,920	1,900	1,940		1,950	4,660	1,600	850	1,200	644	965	1,060
18	1,700	1,870	2,020	1,900	2,050	4,770	1,880	860	1,460	612	995	1,090
19	1,700	1,870	1,940		2,180	5,370	1,550	868	2,660	675	881	1,140
20	1,600	1,950	1,870		2,300	3,360	1,220	767	2,700	980	778	1,140
21	1,630	1,480		2,100		2,200	1,110	664	2,270	816	698	1,210
22	1,680	675		2,020		1,780	1,240	602	2,270	1,090	721	1,210
23	1,680	504	1,810	1,950	2,700	1,510	1,320	591	1,950	1,230	767	1,160
24	1,730	950		1,900		1,510	1,560	450	1,730	1,020	698	1,110
25	1,630	1,120		1,850		1,510	2,530	416	1,700	935	612	1,140
26	1,870	1,250				1,560	3,120	705	1,780	907	633	1,510
27	1,840	1,440				1,510	3,090	995	1,650	1,010	920	1,530
28	1,730	2,010	1,840	1,800	3,500	1,460	2,880	660	1,440	907	1,180	1,510
29	1,730	1,950				1,510	2,400	895	1,230	756	1,110	1,560
30	1,780	1,800				1,510	2,040	1,020	965	829	1,070	1,580
31	1,760					1,560		1,740		1,330	1,180	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,140	1,040	1,570	96,500
November	2,040	504	1,730	103,000
December			1,900	117,000
January			1,840	113,000
February			2,260	130,000
March			2,380	146,000
April	3,120	1,110	1,790	107,000
May	2,030	416	1,160	71,300
June	2,700	602	1,340	79,700
July	1,330	432	843	51,800
August	1,330	542	940	57,800
September	1,580	965	1,180	70,200
The year		416	1,580	1,140,000

## 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 1932. Records June 1918 to December 1923 and April 1925 to September 1930 published by State engineer.

EXTREMES.—Maximum discharge during year, 6,120 second-feet Mar. 18 (gauge height, 4.39 feet); no flow Oct. 1-12, July 12-22, Aug. 22 to Sept. 9. 1918-23, 1925-32; Maximum discharge, 36,700 second-feet June 14, 1921; no flow for several days during summers of 1925, 1927, 1928, 1930-32.

REMARKS.—Records fair. Numerous diversions from headwaters.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0	1,580	2,010	1,620	1,770	4,990	1,670	2,970	1,310	733	500	0
2.....	0	1,680	2,460	2,010	1,770	4,050	1,790	2,600	2,640	404	296	0
3.....	0	1,820	2,800	1,320	1,730	3,180	1,790	2,450	1,920	285	223	0
4.....	0	1,520	2,700	1,460	1,730	2,230	1,790	2,370	1,640	241	195	0
5.....	0	1,680	2,500	1,450	1,700	1,730	1,730	2,160	1,230	274	153	0
6.....	0	1,680	2,200	910	2,000	1,640	1,700	2,050	1,010	252	128	0
7.....	0	1,820				1,600	1,700	1,920	802	174	114	0
8.....	0	1,660				1,500	1,610	1,790	626	167	118	0
9.....	0	1,840				1,130	1,500	1,670	486	136	181	0
10.....	0	1,550				710	1,790	1,610	388	24	142	2
11.....	0	1,710	2,550	3,200	2,100	500	1,790	1,500	340	6	125	6
12.....	0	1,820	1,810		2,410	468	1,830	1,410	436	0	125	6
13.....	250	1,740	1,690		2,360	800	1,830	1,440	468	0	122	5
14.....	484	1,680	2,010		2,100	1,000	1,700	1,560	420	0	105	8
15.....	1,010	1,620	1,890		2,010	1,270	1,560	1,310	372	0	72	60
16.....	1,190	1,650	2,010	1,460	2,020	2,500	1,470	1,010	436	0	84	60
17.....	1,120	2,020	2,010	1,190	2,100	4,250	1,360	871	1,310	0	90	72
18.....	986	1,990	2,460	2,500	2,050	5,750	1,280	710	1,160	0	60	48
19.....	1,160	2,270		3,180	2,010	5,400	1,260	584	1,230	0	63	24
20.....	1,210	2,830		2,850	1,930	5,500	1,210	452	1,360	0	26	60
21.....	1,030	1,900	2,460	2,180	1,810	5,190	1,260	356	2,190	0	2	84
22.....	1,140	994	2,950	1,970	2,460	5,090	1,280	285	2,160	0	2	101
23.....	1,120	1,270	2,950	1,890	2,800	3,400	1,210	230	1,670	5	0	118
24.....	1,160	1,520	2,700	1,810	2,830	2,680	1,310	188	1,610	779	0	146
25.....	986	850	2,950	1,730	2,850	2,410	1,560	188	1,530	223	0	299
26.....	1,100	760	2,000	1,110	3,060	2,190	2,020	285	1,470	146	0	452
27.....	1,140	944		1,620	3,200	2,120	3,860	296	1,280	94	0	452
28.....	1,600	1,890		2,010	4,800	1,990	3,960	274	1,180	42	0	388
29.....	2,050	1,930		1,890	4,440	1,860	3,910	274	1,060	18	0	802
30.....	1,650	1,810		1,810	-----	1,890	3,580	285	917	63	0	848
31.....	1,650	-----		1,810	-----	1,730	-----	1,010	-----	356	0	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2,050	0	711	43,700
November.....	2,890	760	1,670	99,400
December.....	-----	-----	2,280	140,000
January.....	-----	-----	1,960	121,000
February.....	-----	-----	2,350	135,000
March.....	5,750	468	2,600	160,000
April.....	3,960	1,210	1,880	112,000
May.....	2,970	188	1,160	71,300
June.....	2,640	340	1,150	68,400
July.....	779	0	143	8,790
August.....	500	0	94.5	5,810
September.....	848	0	135	8,030
The year.....	5,750	0	1,340	973,000

## 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 1932. At point 7 miles downstream June 1895 to September 1915.

EXTREMES.—Maximum discharge during year, 26,900 second-feet Feb. 27 (gage height, 5.40 feet); minimum, 4 second-feet Oct. 7 (gage height, 0.81 foot).

1895–1915, 1928–32: Maximum discharge, 51,100 second-feet June 23, 1905; no flow during part of summers of 1901, 1902, 1904, 1911, 1913, 1914, 1931.

REMARKS.—Records good except those for Jan. 1 to Mar. 16, which were based on three discharge measurements and temperature records. Numerous diversions from headwaters. Flow partly regulated by reservoirs in Wyoming.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	375	570	1,500	1,300	6,250	2,200	3,630	653	850	620	11
2	23	540	610		1,400	7,390	2,090	3,420	814	754	321	10
3	9	631	540			6,440	2,070	3,140	1,430	754	184	10
4	8	664	493			5,820	1,850	2,620	5,550	754	142	10
5	8	686	600			5,500	1,940	2,120	4,930	730	152	9
6	6	664	530	900	2,000	4,200	1,800	2,070	5,280	1,290	478	7
7	5	642	650			3,450	1,640	1,750	4,030	1,190	152	7
8	6	642	1,240			2,100	1,600	1,600	2,780	790	130	7
9	6	620	1,390			1,500	1,600	1,310	1,890	550	87	7
10	5	642	1,730			750	1,410	1,240	2,940	730	64	14
11	5	631	1,710	850	2,550	1,000	1,390	1,170	2,390	284	42	27
12	6	838	1,510	891		1,100	1,490	1,150	1,990	136	273	84
13	6	906	1,350	890		1,200	1,750	1,070	1,990	79	120	52
14	6	906	1,370			1,500	1,550	962	1,940	32	47	29
15	6	934	1,390			1,800	1,410	990	1,570	19	38	14
16	6	906	1,410	850	2,840	2,100	1,570	1,070	1,330	21	19	7
17	6	838	1,430		3,000	2,530	1,470	1,020	1,330	21	21	8
18	6	826	1,390		3,160	3,000	1,410	1,120	1,290	21	21	9
19	6	802	1,640		3,350	5,940	1,570	920	1,680	66	21	8
20	6	934	1,750		3,600	9,250	1,660	664	2,150	27	21	9
21	5	1,220	1,970	910	5,000	7,470	1,770	460	2,310	9	21	49
22	8	1,410	2,120			7,390	1,510	375	2,250	9	21	284
23	8	1,200	2,070			6,720	1,450	308	2,070	21	19	146
24	8	1,000	2,150			6,870	1,570	302	2,070	10	13	61
25	8	720	1,940			7,950	5,230	1,940	314	2,200	9	15
26	8	412	2,120	1,080	12,600	3,480	1,620	620	1,850	9	14	29
27	8	570	2,170		25,800	3,240	1,750	530	1,660	10	89	21
28	8	664	2,280		24,300	3,070	1,940	452	1,620	9	52	17
29	8	642	2,310		15,500	2,910	2,040	321	1,330	9	38	16
30	8	600	2,310		-----	2,750	3,750	790	1,050	9	20	14
31	328	-----	2,100	-----	-----	2,500	-----	653	-----	9	14	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	328	5	20.5	1,260
November	1,410	375	769	45,800
December	2,310	530	1,510	92,800
January	-----	-----	1,020	62,700
February	25,800	-----	5,230	301,000
March	9,250	750	4,010	247,000
April	3,750	1,390	1,760	105,000
May	3,630	302	1,230	75,600
June	5,550	653	2,210	132,000
July	1,290	9	297	18,300
August	620	13	105	6,460
September	284	7	33.7	2,010
The year	25,800	5	1,500	1,090,000

## 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 is 1,021.1 feet above mean sea level.

DRAINAGE AREA.—83,800 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 58,000 second-feet Feb. 28 (gage height, 6.7 feet); minimum discharge (estimated), 1,000 second-feet Mar. 10, 1928-32; Maximum discharge, that of Feb. 28, 1932; minimum, that of Mar. 10, 1932.

REMARKS.—Records good except those for Jan. 8 to Mar. 18, which were based on three discharge measurements and temperature records. Numerous diversions from headwaters. No regulations except on headwater streams.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	2,460	2,480	3,750	9,370	3,500	34,400	7,270	4,740	18,600	3,420	2,050	2,510	
2	2,300	2,510	4,390	8,050		29,700	6,610	9,050	18,400	2,620	8,200	2,280	
3	2,110	2,460	4,240	5,420		28,100	5,720	7,760	26,400	2,300	8,890	2,140	
4	2,090	2,590	3,920	3,970	3,330	23,400	5,540	7,550	18,100	2,240	6,350	2,070	
5	2,120	2,670	3,970	4,340		16,000	6,480	7,270	16,200	2,430	3,340	2,050	
6	2,120	2,890	3,580	4,590		10,000	6,480	6,670	13,100	2,960	3,710	1,990	
7	2,160	2,960	3,160	3,380	4,000	4,000	6,030	20,100	13,000	2,890	10,800	1,900	
8	1,990	2,960	3,580	2,960		3,300	5,480	6,030	10,800	2,990	7,980	1,780	
9	2,110	3,130	4,340	2,200		2,150	4,960	9,290	13,200	3,580	6,670	1,800	
10	2,430	2,920	5,720	2,600	4,800	1,000	5,420	7,550	31,100	2,510	6,800	1,920	
11	2,510	2,920	7,340	2,300		4,800	1,300	5,300	6,740	17,100	2,090	5,540	2,200
12	2,320	3,840	8,500				1,700	5,600	6,220	8,420	2,620	15,000	2,730
13	2,670	3,710	8,120				3,300	5,420	5,540	11,400	2,240	14,800	3,200
14	2,540	3,380	4,910	2,100	5,000	5,200	4,340	4,540	12,300	2,070	11,700	3,500	
15	2,800	3,920	3,200			8,500	4,100	4,440	12,300	1,890	14,600	5,130	
16	2,990	3,420	2,730			2,100	10,000	4,200	3,920	7,000	1,890	6,940	4,060
17	2,920	3,240	2,300	2,200	5,000	13,500	4,440	4,490	7,550	1,920	5,080	3,020	
18	2,460	3,160	2,430			16,000	4,240	4,240	17,600	1,990	3,970	2,480	
19	2,560	3,310	2,990			17,800	4,690	4,440	9,960	1,900	3,160	2,410	
20	2,430	3,670	4,540	2,300	6,000	15,500	5,420	4,590	9,130	1,960	2,760	2,260	
21	2,390	4,590	6,030			6,000	16,600	5,300	3,630	8,050	1,960	2,480	2,390
22	2,390	6,030	7,070			8,000	11,200	4,740	3,020	11,600	1,960	2,350	4,100
23	2,350	8,280	8,420	2,300	42,500	10,000	4,960	2,670	7,900	2,260	3,060	4,290	
24	2,320	9,880	9,290			12,000	11,000	4,290	2,540	6,670	1,920	2,460	4,150
25	2,300	4,540	7,980			15,000	11,500	4,440	2,280	7,830	4,690	2,160	3,920
26	2,320	3,060	7,830	3,000	42,500	17,300	10,500	7,410	2,830	7,070	2,800	2,070	
27	2,560	2,430	7,410			24,400	9,450	7,270	4,340	8,350	1,960	2,090	3,060
28	2,320	2,430	7,690			37,100	8,970	6,220	7,550	12,000	1,730	2,460	2,920
29	2,410	2,620	8,050	3,000	42,500	42,500	8,050	5,420	4,390	7,410	1,570	2,480	
30	2,410	3,130	8,200			8,280	4,740	2,560	6,030	1,540	3,060	3,340	
31	2,560		9,540				7,410		2,830		2,010	3,200	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,990	1,990	2,400	148,000
November	9,880	2,430	3,640	217,000
December	9,540	2,300	5,650	347,000
January	9,370	2,100	3,190	196,000
February	42,500	-----	8,920	513,000
March	34,400	1,000	11,600	713,000
April	7,410	4,100	5,420	329,000
May	20,100	2,280	5,610	345,000
June	31,100	6,030	12,500	744,000
July	4,690	1,540	2,330	144,000
August	15,000	2,050	5,680	349,000
September	5,130	1,780	2,860	170,000
The year	42,500	1,000	5,790	4,210,000

## ENCAMPMENT RIVER AT ENCAMPMENT, WYO.

LOCATION.—Chain gage in sec. 6, T. 14 N., R. 83 W., at Encampment. Zero of gage is 7,141.53 feet above mean sea level.

DRAINAGE AREA.—219 square miles.

RECORDS AVAILABLE.—May to September 1900; May 1911 to August 1924; May 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 2,520 second-feet May 23 (gage height, 7.44 feet); minimum occurred during winter.

1900, 1911-24, 1929-32: Maximum discharge, 4,680 second-feet May 29, 1900; minimum, 3 second-feet July 24, 1919.

REMARKS.—Records good except those for Nov. 12 to Apr. 5, which were based on two discharge measurements and temperature records. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Apr.	May	June
1	32	56				238	1,510
2	40	57				251	1,370
3	33	62		a 34	75	251	1,440
4	35	55				248	1,570
5	34	48				261	1,780
6	41	42	a 33		83	496	1,780
7	44	41			99	491	1,540
8	48	44			91	502	1,690
9	44	44			75	513	1,600
10	62	43			75	814	1,480
11	69	45			93	958	1,650
12	69				97	1,210	1,590
13	69	38			106	1,510	1,650
14	62				141	1,770	1,780
15	54				141	1,780	1,940
16	52				153	1,760	1,960
17	46				182	1,780	1,870
18	40	40			169	1,810	1,910
19	44				169	1,900	2,000
20	44				182	2,190	2,030
21	60				271	2,260	1,910
22	60				302	2,440	2,070
23	56	38			261	2,460	2,190
24	56				242	2,040	2,250
25	56				235	1,690	1,890
26	63				242	1,460	1,930
27	54				220	1,250	1,780
28	54	35			220	1,270	1,820
29	59				208	1,390	1,850
30	63				242	1,560	1,870
31	59					1,590	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	69	32	51.7	3,180
November	62		41.8	2,490
December			36	2,210
January			34	2,090
February			40	2,300
March			45	2,770
April	302		156	9,280
May	2,460	238	1,290	79,300
June	2,250	1,370	1,790	107,000
The period				211,000

\* Result of discharge measurement.

## PASS CREEK NEAR SARATOGA, WYO.

LOCATION.—Staff gage in sec. 29, T. 19 N., R. 82 W., below mouth of Oberg Creek and 12 miles northeast of Saratoga.

DRAINAGE AREA.—119 square miles.

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

EXTREMES.—Maximum discharge during period October to June, 421 second-feet May 20 (gage height, 5.61 feet); minimum occurred during winter.

1929-32: Maximum discharge, 450 second-feet May 23, 1929 (gage height, 5.5 feet); minimum, 2.6 second-feet Aug. 1, 1930.

REMARKS.—Records fair. No records Dec. 1 to Mar. 31. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Apr.	May	June	Day	Oct.	Nov.	Apr.	May	June
1-----	4	12	4	49	212	16-----	8	8	35	198	226
2-----	4	12	5	90	184	17-----	7	11	158	239	240
3-----	5	12	8	212	177	18-----	7	11	149	275	173
4-----	6	10	9	242	191	19-----	7	9	67	307	169
5-----	6	10	14	246	196	20-----	6	7	124	376	168
6-----	5	10	14	184	256	21-----	24	7	215	344	138
7-----	8	10	40	198	248	22-----	16		155	368	126
8-----	8	9	54	187	214	23-----	14		95	360	134
9-----	7	10	33	265	198	24-----	14	8	57	264	120
10-----	6	10	44	310	257	25-----	14		64	248	119
11-----	10	9	40	292	219	26-----	12		82	224	113
12-----	10	10	28	320	198	27-----	12	8	60	170	100
13-----	12	11	40	320	198	28-----	10		56	152	56
14-----	10	8	50	320	205	29-----	10		51	175	90
15-----	8	10	72	312	205	30-----	8	9	26	224	114
						31-----	9			208	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	24	4	9.3	572
November-----	12		9.1	541
April-----	158	4	61.6	3,670
May-----	376	49	248	15,200
June-----	257	56	175	10,400



## ROCK CREEK NEAR ROCK RIVER, WYO.

LOCATION.—Water-stage recorder in sec. 4, T. 20 N., R. 76 W.,  $1\frac{1}{2}$  miles southeast of Rock River.

DRAINAGE AREA.—184 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 630 second-feet June 17 (gage height, 3.47 feet); no flow Sept. 23.

1928-32: Maximum discharge, 1,180 second-feet May 29, 30, 1928; no flow Sept. 2-20, 1931, and Sept. 23, 1932.

REMARKS.—Records good except those for Nov. 15 to Apr. 5, which were based on two discharge measurements and temperature records. Diversions for irrigation above station. Flow partly regulated by two reservoirs.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1.	2	5			20	80	176	200	14	3
2.	2	5		* 4	25	124	208	168	10	3
3.	2	5			30	103	160	145	6	2
4.	2	5			30	78	152	95	6	2
5.	2	3			50	59	216	65	5	2
6.	2	3	* 6		69	54	336	46	5	2
7.	2	3			58	50	336	32	5	2
8.	3	3			33	64	312	28	5	2
9.	3	3			38	53	270	21	4	2
10.	3	3			36	44	336	15	5	1
11.	5	3			34	40	270	16	16	2
12.	6	3			42	36	270	16	16	2
13.	5	4			50	29	312	52	15	2
14.	4	4			54	28	336	19	14	2
15.	3	4			51	44	362	8	13	1
16.	3				50	78	448	7	18	1
17.	3				35	63	550	6	26	1
18.	3	4			39	60	418	10	21	1
19.	3				30	82	336	16	19	1
20.	3				32	160	290	10	16	1
21.	4				33	225	336	8	14	0
22.	5				38	290	336	8	18	0
23.	4	3			44	362	390	10	26	1
24.	3				28	362	448	11	20	2
25.	3				42	270	448	18	15	3
26.	3				103	252	336	19	10	3
27.	3				65	208	290	13	10	3
28.	3	4			71	152	252	10	9	3
29.	5				65	117	390	18	6	3
30.	3				72	124	270	27	4	3
31.	3					160		28	3	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6	2	3.2	197
November	5		3.7	220
December			5	307
January			5	307
February			6	345
March			10	615
April	103	20	45.6	2,710
May	362	28	124	7,620
June	550	152	320	19,000
July	200	6	36.9	2,270
August	26	3	12.1	744
September	3	0	1.9	113
The year	550	0	47.5	34,400

\* Result of discharge measurement.

## 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 December 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to December 1932, 1,160 second-feet July 9 (gage height, 5.35 feet); minimum, 0.9 second-foot Aug. 8 (gage height, 1.24 feet).

1916-24, 1928-32: Maximum discharge, 4,600 second-feet Apr. 15, 1924; no flow during summers of 1919 and 1922.

REMARKS.—Records good. No record Dec. 3, 1931 to Feb. 29, 1932. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1-----	1.1	7.4	24	35	40	180	91	4.0	1.7	1.1	1.1	11	22
2-----	.6	7.0	29		39	290	84	7.4	1.6	1.1	1.1	13	22
3-----	.4	1.7	-----		56	552	79	7.4	1.5	1.1	1.2	12	21
4-----	.4	1.8	-----		84	790	70	7.4	1.4	1.1	2.0	11	22
5-----	.5	1.8	-----		92	670	62	3.3	1.4	1.1	2.6	16	20
6-----	.5	2.0	-----	32	124	750	59	2.0	1.5	1.1	3.6	18	20
7-----	.6	2.3	-----		112	670	52	1.8	1.1	1.1	3.6	16	20
8-----	.6	3.4	-----		106	514	52	1.9	.9	1.1	5.1	20	20
9-----	.6	5.1	-----		95	630	49	355	1.0	1.1	5.5	24	-----
10-----	.7	8.7	-----		81	670	46	2.3	1.0	1.1	5.9	18	-----
11-----	.7	10	-----	30	79	750	46	3.6	1.0	1.1	9.4	19	-----
12-----	.7	10	-----	30	92	830	50	3.3	1.1	1.1	11	33	-----
13-----	.7	14	-----	32	110	750	48	2.0	1.1	1.1	11	25	-----
14-----	.7	20	-----	32	195	830	37	2.3	1.1	1.1	11	24	-----
15-----	.8	20	-----	30	322	830	29	2.3	1.1	1.1	11	25	-----
16-----	.8	22	-----	28	406	630	20	2.2	1.1	1.1	11	24	-----
17-----	.8	20	-----	31	514	478	8.7	1.5	1.1	1.2	11	26	-----
18-----	.9	17	-----	27	372	442	2.2	1.4	1.1	1.0	12	26	-----
19-----	1.0	19	-----	31	338	442	2.3	1.0	1.1	1.0	7.0	26	-----
20-----	1.0	40	-----	35	338	424	2.6	1.2	1.1	1.0	7.4	24	-----
21-----	.9	23	-----	39	478	406	2.3	1.4	1.0	1.0	16	26	-----
22-----	1.0	26	-----	39	670	389	2.2	1.3	1.0	1.0	16	21	-----
23-----	1.0	26	-----	37	372	322	2.2	1.0	1.0	1.0	16	20	-----
24-----	1.1	25	-----	40	258	258	2.2	1.2	1.0	1.0	17	20	-----
25-----	1.5	26	-----	41	242	210	2.0	1.2	1.0	1.0	17	20	-----
26-----	2.0	23	-----	37	306	204	2.3	1.2	1.0	1.0	16	22	-----
27-----	6.6	25	-----	41	258	204	3.3	1.2	1.1	1.0	12	22	-----
28-----	8.7	26	-----	37	306	174	4.7	1.0	1.1	1.0	7.0	22	-----
29-----	6.6	22	-----	39	174	147	4.4	1.0	1.1	1.0	10	22	-----
30-----	11	26	-----	37	195	118	6.6	1.0	1.1	1.0	10	22	-----
31-----	19	-----	-----	39	-----	102	-----	1.1	1.1	-----	11	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October-----	19	0.4	2.37	146
November-----	40	1.7	16.0	952
March-----	41	27	34.4	2,120
April-----	670	39	228	13,600
May-----	830	102	473	29,100
June-----	91	2.0	30.7	1,830
July-----	355	1.0	13.7	842
August-----	1.7	.9	1.15	71
September-----	1.2	1.0	1.06	63
1932				
October-----	17	1.1	9.08	558
November-----	33	11	20.9	1,240
December 1-8-----	22	20	20.9	331

## 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 1932.

EXTREMES.—Maximum discharge during year, 654 second-feet May 15 (gage height, 4.74 feet); no flow June 6–13.

1911, 1916–24, 1928–32: Maximum discharge, 2,050 second-feet May 22, 1922; no flow during summers of 1922, 1929, 1931, 1932.

REMARKS.—Records fair. No records Dec. 1 to Mar. 31. Discharge estimated Nov. 21–30, Apr. 1, 2, May 17–21. Diversions for irrigation above station.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	2	11	20	100	2	0.4	0.4	1
2	3	12	25	162	2	.4	.4	1
3	3	10	30	300	1	.3	.4	1
4	3	6	44	448	.4	.4	.5	.9
5	3	6	59	396	.2	.4	.5	.7
6								
6	3	6	64	430	.1	.4	.5	.6
7	3	6	37	462	0	.4	.5	.7
8	3	6	27	386	0	.4	.4	.6
9	4	6	23	376	0	.4	.4	.6
10	6	7	19	396	0	1	.4	.7
11								
11	7	9	23	465	0	2	.5	1
12	7	9	20	524	0	.4	.4	.9
13	7	8	34	528	0	.4	.4	.9
14	7	6	62	552	.5	.4	.5	.7
15	7	3	105	633	1	.4	.5	.9
16								
16	7	4	128	563	1	.6	.5	1
17	8	5	141	463	.5	1	.5	1
18	9	5	128	354	.4	.9	.5	1
19	9	4	103	287	.2	.7	.5	1
20	10	4	119	220	.3	.6	.5	1
21								
21	11	3	153	153	.3	.5	.5	1
22	10		175	126	.2	.5	.5	1
23	12		183	117	.2	.6	.5	1
24	10		155	83	.2	1	.5	2
25	11		158	56	.2	1	.6	3
26								
26	11	4	172	48	.3	1	.6	3
27	12		134	38	.3	1	2	2
28	14		146	28	.6	1	.5	3
29	12		109	21	.9	.4	2	3
30	12		103	10	.4		1	3
31	11			4		.5	1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	14	2	7.6	467
November	12	3	5.6	333
April	153	19	90.0	5,300
May	633	4	282	17,300
June	2	0	.44	26
July	2	.3	.64	39
August	5	.4	.75	46
September	3	.6	1.31	78

## 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 1932.

EXTREMES.—Maximum discharge during year, 367 second-feet May 14 (gage height, 7.18 feet); minimum, 0.8 second-foot Aug. 19–22 (gage height, 3.30 feet).

1919–32: Maximum discharge, 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).

REMARKS.—Records poor except those of low water, which are good. Discharge not computed Oct. 1 to Mar. 18. Discharge estimated Apr. 3–8, Aug. 1, 2, 4, 5, Sept. 23, 28, 29. Diversions for irrigation above station. Gage-height record furnished by Douglas Reservoir Water Users Association.

*Discharge, in second-feet, 1932*

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		23	129	90	2	1	3
2.....		46	194	6	1	1	4
3.....		65	240	2	1	2	4
4.....		70	243	2	1	1	4
5.....		75	218	29	1	1	3
6.....		80	239	2	1	1	3
7.....		75	260	23	1	1	2
8.....		75	237	18	1	1	2
9.....		73	240	15	.9	1	1
10.....		70	256	19	.9	1	1
11.....		71	291	19	.9	1	1
12.....		86	312	19	.9	1	1
13.....		119	309	19	.9	1	1
14.....		139	326	9	.9	1	1
15.....		126	337	6	1	1	1
16.....		131	264	4	1	1	1
17.....		134	218	4	1	1	1
18.....		116	207	3	1	1	1
19.....	17	101	219	2	.8	1	1
20.....	20	126	267	2	.8	1	1
21.....	21	151	240	2	.8	1	1
22.....	19	165	230	2	.8	1	1
23.....	17	145	197	2	.9	1	1
24.....	17	112	152	2	1	1	1
25.....	17	124	129	2	1	1	1
26.....	17	162	122	2	1	1	1
27.....	18	132	112	2	1	1	1
28.....	21	154	104	2	1	2	1
29.....	21	127	49	2	1	1	1
30.....	20	123	89	2	1	1	1
31.....	21		68		1	2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 19–31.....	21	17	18.9	487
April.....	165	23	107	6,370
May.....	337	68	210	12,900
June.....	90	2	13.5	803
July.....	2	.8	.98	60
August.....	2	1	1.1	68
September.....	4	1	1.6	95
The period.....				20,800

## 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 November 1932.

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 19 second-feet Apr. 27 (gage height, 0.89 foot); no flow several days during May and June.

1916, 1918, 1923-24, 1928-32: Maximum discharge, 437 second-feet May 10, 1918; no flow several days during 1931 and 1932.

REMARKS.—Records fair. No record Dec. 1, 1931, to Mar. 19, 1932. Diversions for irrigation above station. Flow regulated by La Prele Reservoir, capacity, 20,000 acre-feet.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	2	2		6	8	10	0.4	0.3	0.3	1	3
2	2	3		6	4	4	.6	.1	.5	1	4
3	2	4		6	2	.5	.4	.3	.4	1	6
4	2	4		6	2	.1	.1	.4	.3	1	7
5	2	5		6	4	0	.2	.2	.4	2	8
6	2	5		6	5	0	.5	.3	.3	1	9
7	2	5		6	6	1	.5	.4	.1	1	11
8	2	5		6	2	2	.3	.5	.2	1	11
9	2	4		6	2	1	.2	.3	.3	1	12
10	2	5		6	2	2	.4	.3	.8	2	13
11	2	6		6	1	2	.1	.5	1	1	15
12	2	6		6	1	2	.1	.3	1	.7	15
13	2	6		5	2	2	.3	1	1	.2	16
14	2	5		4	2	.8	.6	.3	1	.1	17
15	2	5		4	2	.6	.4	.4	1	.2	18
16	4	4		4	2	.4	.2	.4	1	.3	18
17	5	4		4	2	.2	.3	.8	2	.5	18
18	4	5		4	2	.2	.5	.9	1	.4	17
19	4	5		4	3	.4	.4	.5	1	.1	18
20	4	4	6	3	.1	.6	.6	.3	1	.1	17
21	5	4	7	1	0	.4	.3	.3	.9	.2	16
22	5		6	2	0	.3	.2	.4	.9	.3	15
23	4		6	4	0	.5	.1	.3	.7	.8	15
24	4		7	7	0	.3	.2	.3	.7	1	13
25	4		6	12	0	.4	.6	.4	.9	2	13
26	2	4	6	15	0	.3	.4	.4	.9	3	15
27	2		6	19	0	.6	.3	.3	1	4	15
28	3		6	16	0	.2	.5	.5	1	4	15
29	3		6	13	16	.9	.4	.3	1	3	13
30	3		6	10	18	.7	.7	.2	1	2	12
31	2		6		20		.6	.1		2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October	5	2	2.8	172
November	6	2	4.4	262
March 20-31	7	6	6.2	148
April	19	1	6.8	405
May	20	0	3.49	215
June	10	0	1.15	68
July	.7	.1	.37	23
August	.9	.1	.36	22
September	2	.1	.79	47
1932				
October	4	.1	1.22	75.0
November	18	3	13.2	786

## WAGONHOUND CREEK NEAR LA BONTE, WYO.

LOCATION.—Chain gage in sec. 16, T. 31 N., R. 71 W., 3 miles east of La Bonte and half a mile above mouth of creek.

DRAINAGE AREA.—125 square miles.

RECORDS AVAILABLE.—April 1916 to September 1924; May 1929 to June 1932.

EXTREMES.—Maximum discharge during period March to June, 69 second-feet May 8 (gage height, 3.36 feet); no flow June 14–30.

1916–24, 1929–32: Maximum discharge, 907 second-feet May 11, 12, 1920; no flow during summers of 1918, 1919, 1922, 1930, 1931, 1932.

REMARKS.—Records approximate. No record Oct. 1 to Mar. 19. Diversion for irrigation above station.

*Discharge, in second-feet, 1932*

Day	Mar.	Apr.	May	June	Day	Mar.	Apr.	May	June
1		28	49	15	16		52	29	0
2		30	49	15	17		44	29	0
3		32	51	15	18		46	28	0
4		34	51	15	19		49	27	0
5		38	52	16	20	12	47	21	0
6		39	52	13	21	12	47	17	0
7		43	52	12	22	14	46	16	0
8		46	68	10	23	16	44	15	0
9		45	62	10	24	16	43	15	0
10		43	53	10	25	18	42	14	0
11		41	48	11	26	18	43	14	0
12		42	39	8	27	17	45	15	0
13		45	39	2	28	20	47	15	0
14		46	37	0	29	22	48	16	0
15		49	32	0	30	24	47	16	0
					31	26		16	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 20-31	26	12	17.9	426
April	52	28	43.0	2,590
May	68	14	33.5	2,000
June	16	0	5.1	303
The period				5,350

## LA BONTE CREEK NEAR LA BONTE, WYO.

LOCATION.—Chain gage in sec. 21, T. 31 N., R. 71 W., 1½ 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 November 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 445 second-feet May 4 (gage height, 2.43 feet); minimum, 0.2 second-foot Sept. 18 (gage height, 0.20 foot).

1916-24, 1928-32: Maximum discharge, 2,750 second-feet May 22, 23, 1923 (gage height, 7.5 feet); no flow during summers of 1917, 1918, 1931.

REMARKS.—Records good. No record Dec. 1, 1931, to Mar. 19, 1932. Diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.	O-t.	Nov.
1	0.6	6		38	227	51	8	0.7	2.	0.2	2
2	.6	7		64	298	38	7	.6	1	.2	2
3	.6	7		90	348	31	6	.7	.9	.2	3
4	.7	7		91	436	26	6	1	.6	.6	2
5	.9	6		94	419	24	5	.9	.6	.4	2
6		6		108	385	23	5	1	.2	.6	1
7	1	6		101	428	20	5	.9	.6	.7	.7
8	2	7		94	410	13	5	.9	1	.9	1
9	2	7		93	410	6	4	.4	.9	1	1
10	2	7		94	402	2	2	.2	.9	1	1
11	2	7		94	410	20	2	.2	.7	.7	1
12	3	6		98	402	12	2	.2	.6	.9	1
13	3	6		117	352	9	2	.2	.6	1	.7
14	4	7		160	336	7	3	.2	.6	1	1
15	4	6		202	320	6	3	.2	.6	1	1
16	4	6		234	294	7	4	8	.6	1	2
17	4	6		214	247	6	2	.7	.2	1	2
18	4	6		196	193	8	.9	.2	.2	1	2
19	4	6		202	167	9	.6	.4	.2	1	1
20	4	7	25	193	164	9	.6	.2	.2	1	1
21	5	7	32	227	160	8	.6	.6	.2	1	2
22	6		33	261	138	8	.9	.6	.2	2	2
23	6		31	268	118	7	1	.6	.2	2	2
24	6		29	234	109	8	1	.6	.2	2	2
25	6		28	254	104	7	2	.6	.2	1	2
26	6	5	30	397	104	8	1	.6	.6	2	2
27	6		29	313	104	8	1	2	.9	2	2
28	6		27	313	101	58	2	2	.4	2	2
29	6		26	261	82	27	1	1	.4	2	2
30	6		27	244	74	13	1	1	.7	2	2
31	6		31		64		1	1		2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October	6	0.6	3.63	223
November	33		6.0	357
March 20-31	7	25	29	690
April	397	38	178	10,600
May	436	64	252	15,500
June	58	2	16.0	952
July	8	.6	2.76	170
August	8	.2	.92	57
September	2	.2	.57	34
1932				
October	2	.2	1.14	70
November	3	.7	1.61	96

## HORSESHOE CREEK NEAR GLENDO, 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 November 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 204 second-feet May 7 (gage height, 2.99 feet); minimum, 1.8 second-feet several days in September and October 1932 (gage height, 0.88 foot).

1916-19, 1921-24, 1928-32: Maximum discharge, 1,210 second-feet June 2, 1929 (gage height, 6.8 feet); no flow during summers of 1918 and 1919.

REMARKS.—Records good. No record Jan. 1 to Feb. 29. Diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1.....	2.6	3.4	4.0	9.0	15	92	20	8.0	2.0	4.4	1.8	1.9
2.....	2.6	3.8	4.0	9.0	15	110	14	8.0	2.0	4.4	1.8	1.9
3.....	2.6	3.8	4.0	9.5	20	143	12	8.5	2.0	4.4	1.8	1.9
4.....	2.6	3.8	4.0	9.5	29	166	10	8.5	3.5	4.4	1.8	1.9
5.....	2.6	3.6	4.0	9.5	36	166	9.0	7.0	3.5	4.4	1.8	1.9
6.....	2.6	3.6	3.8	9.0	34	184	7.0	7.0	3.5	4.4	1.8	1.9
7.....	2.6	3.6	3.8	9.0	36	204	6.0	7.0	3.5	4.4	1.8	1.9
8.....	2.6	3.4	3.6	8.5	35	175	6.0	7.0	2.0	4.4	1.8	1.9
9.....	2.6	3.6	3.4	9.0	30	158	6.0	7.0	2.6	4.4	1.8	1.9
10.....	2.6	3.6	3.4	8.0	31	158	6.0	7.0	2.6	4.4	1.8	1.9
11.....	2.6	3.6	3.0	5.0	27	166	7.0	7.0	2.6	4.4	1.8	1.9
12.....	2.6	3.8	3.0	5.0	28	166	6.0	6.5	3.5	4.4	1.8	1.9
13.....	2.6	3.8	3.0	5.0	29	143	5.5	6.0	3.5	4.4	1.8	3.8
14.....	2.6	3.8	3.0	5.5	27	143	5.0	5.0	3.5	4.4	1.8	4.1
15.....	2.6	4.0	3.2	6.0	27	130	4.4	4.4	3.5	3.8	1.8	4.1
16.....	2.6	3.8	3.2	7.0	29	136	5.5	4.4	3.5	2.6	1.9	4.1
17.....	2.6	3.8	3.2	8.0	33	110	6.5	4.1	3.5	1.8	1.9	4.1
18.....	2.6	3.8	3.4	9.5	36	97	8.0	4.4	3.2	1.8	1.9	4.1
19.....	2.6	3.8	3.4	7.0	28	70	7.5	4.4	2.9	1.8	1.9	4.1
20.....	2.6	4.0	3.4	7.0	25	58	7.5	4.7	2.9	1.8	1.9	4.1
21.....	2.6	4.0	3.4	7.0	29	66	8.5	4.1	2.6	1.8	1.9	4.1
22.....	2.6	4.0	3.4	9.0	28	70	8.0	3.8	2.9	1.8	1.9	4.1
23.....	2.6	4.0	3.6	9.5	39	62	8.0	3.8	2.6	1.8	1.9	4.1
24.....	2.6	4.0	3.4	10	70	66	7.5	3.8	2.6	1.8	1.9	4.1
25.....	2.6	4.0	3.4	11	106	62	6.0	3.8	2.6	1.8	1.9	4.1
26.....	2.6	4.0	3.4	12	136	62	5.0	3.5	4.4	1.8	1.9	4.1
27.....	2.6	4.0	3.4	15	120	66	7.5	3.5	3.8	1.8	1.9	4.1
28.....	2.6	4.0	3.4	15	120	41	8.0	3.5	3.2	1.8	1.8	4.1
29.....	2.6	4.0	3.4	15	120	37	5.0	3.8	3.8	1.8	1.8	4.1
30.....	2.6	4.0	3.4	15	120	36	8.0	3.2	4.4	1.8	1.8	4.1
31.....	2.6	-----	3.4	15	-----	29	-----	2.0	4.4	-----	1.9	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October.....	2.6	2.6	2.60	160
November.....	4.0	3.4	3.81	227
December.....	4.0	3.0	3.46	213
March.....	15	5.0	9.31	572
April.....	120	15	48.6	2,890
May.....	204	29	109	6,700
June.....	20	4.4	7.68	457
July.....	8.0	2.0	5.31	326
August.....	4.4	2.0	3.13	192
September.....	4.4	1.8	3.11	185
1932				
October.....	1.9	1.8	1.84	113
November.....	4.1	1.9	3.21	191



## 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 1929 to November 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to November 1932, 280 second-feet May 20 (gage height, 4.00 feet); no flow July 12, 15.

1916-24, 1929-32: Maximum discharge, 840 second-feet June 1, 1929 (gage height, 5.02 feet); minimum, that of July 12, 15, 1932.

Maximum stage known, 10.6 feet Aug. 15, 1927 (discharge, about 5,800 second-feet).

REMARKS.—Records fair. No record Jan. 1 to Feb. 29. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	0.8	9	10	5	6	6	3	3	4	5	10	
2	2	8	9	4	6	7	3	2	1	4	8	
3	2	10	10	6	6	7	3	2	4	6	10	
4	2	10	9	7	6	6	4	2	2	6	10	
5	2	10	10	7	4	7	2	2	.8	6	10	
6	4	10	9	7	5	6	2	3	2	4	10	
7	4	9	9	6	4	6	4	1	.6	4	11	
8	4	8	11	6	5	8	4	2	1	6	11	
9	4	8	10	6	7	6	4	2	1	4	11	
10	4	7	11	6	6	8	4	2	2	2	10	
11	5	8	8	6	7	6	4	.8	4	6	9	
12	3	10	8	6	7	6	6	0	3	3	8	
13	5	10	8	6	6	6	4	.4	1	3	10	
14	2	10	8	6	6	6	4	.2	2	6	10	
15	2	10	9	6	6	6	4	0	4	5	11	
16	4	10	10	7	4	6	2	.6	.6	2	10	
17	5	10	7	7	5	8	3	2	4	4	8	
18	2	11	9	8	5	6	4	2	4	5	10	
19	4	10	8	5	4	7	3	.8	3	6	11	
20	2	11	7	8	5	58	4	1	4	5	11	
21	4	11	8	8	5	2	2	2	4	4	10	
22	4	12	9	8	6	2	3	1	4	6	12	
23	4	12	9	6	6	2	3	2	4	7	12	
24	6	11	11	7	7	2	4	1	4	5	12	
25	2	10	12	7	7	2	2	1	4	8	12	
26	7	10	11	9	6	2	4	1	4	8	12	
27	6	11	11	8	7	3	3	2	4	8	12	
28	8	11	12	7	8	3	4	2	6	8	12	
29	8	10	13	8	8	2	4	2	6	7	12	
30	6	10	12	8	7	4	2	2	4	10	11	
31	6		12	8		1		2	5		10	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October	8	0.8	3.99	245
November	12	7	9.9	589
December	13	7	9.7	596
March	9	4	6.7	412
April	8	4	5.9	351
May	58	1	6.7	412
June	6	2	3.4	202
July	3	0	1.51	93
August	6	.6	3.13	192
September	10	2	5.4	321
1932				
October	12	8	10.5	646
November			11.3	672

## 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 1932.

EXTREMES.—Maximum discharge during year, 1,610 second-feet May 23 (gage height, 3.69 feet); minimum occurred during winter.

1904-5, 1911-32: Maximum discharge, 4,200 second-feet June 9, 1923 (gage height, 4.15 feet); minimum, 21 second-feet Sept. 10-13, 1931 (gage height, 0.88 foot).

REMARKS.—Records excellent except those for period Nov. 17 to Apr. 17, which were based on three discharge measurements and temperature records. Diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1.	39	56	55	90	750	456	86	54
2.	40	52		112	710	432	84	45
3.	47	51		147	675	409	70	40
4.	48	48		169	750	342	65	38
5.	44	47		196	832	277	62	35
6.	48	45	70	179	875	237	58	35
7.	58	44		182	832	207	54	34
8.	58	43		182	790	176	51	31
9.	51	44		200	790	163	51	30
10.	51	42		237	790	147	47	29
11.	61	47	85	298	790	150	52	30
12.	68	52		320	790	182	49	30
13.	61	54		409	750	153	47	29
14.	52	54		555	790	130	47	27
15.	54	58		640	832	110	47	27
16.	52	54	100	640	875	103	52	27
17.	51			610	790	94	82	25
18.	51	50		125	750	675	92	75
19.	49			115	920	640	82	72
20.	49			122	1,110	710	78	62
21.	59	45	150	1,260	675	73	59	25
22.	67		163	1,490	640	73	59	27
23.	65		139	1,430	750	73	55	28
24.	62		108	1,160	675	75	48	30
25.	61		120	1,010	640	82	43	38
26.	61	40	120	750	610	75	42	40
27.	55		92	640	610	70	48	35
28.	51		96	610	640	68	51	36
29.	54		90	640	555	94	45	36
30.	59		88	790	480	88	44	34
31.	56			710		98	52	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	68	39	54.3	3,840
November	58		47.2	2,810
December			35	2,150
January			30	1,840
February			30	1,730
March			40	2,460
April	163		92.6	5,510
May	1,490	90	595	36,600
June	875	480	724	43,100
July	456	68	158	9,720
August	86	42	56.7	3,490
September	54	23	32.2	1,920
The year	1,490		158	115,000

## LARAMIE RIVER AND PIONEER CANAL NEAR WOODS, WYO.

LOCATION.—In sec. 36, T. 14 N., R. 77 W., 2 miles east of Woods.

DRAINAGE AREA.—418 square miles.

RECORDS AVAILABLE.—April 1912 to September 1924; April to September 1927; April to September, 1932.

EXTREMES.—Laramie River: Maximum discharge during year, 1,820 second-feet May 27 (gage height, 2.78 feet); no flow several days in August and September.

Pioneer Canal: Maximum discharge during year, 495 second-feet June 2 (gage height, 4.50 feet); minimum, 14 second-feet Sept. 18 (gage height, 0.62 foot).

1912-24, 1927, 1932: Laramie River, 5,060 second-feet June 10, 1923; minimum, that of 1932.

REMARKS.—Records good. Diversion for irrigation above station.

*Discharge, in second-feet, of Laramie River near Woods, 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		159	940	438	32	9	16	194	1,070	740	72	3	1
2		199	334	418	26	8	17	194	1,020	700	60	17	5
3		250	450	424	10	6	18	186	1,110	660	56	41	5
4		285	780	334	10	4	19	182	1,280	660	48	17	3
5		328	860	255	9	3	20	194	1,460	740	32	15	0
6		306	940	212	7	1	21	231	1,550	700	17	4	0
7		301	860	182	5	1	22	240	1,730	660	7	23	0
8		312	820	148	0	0	23	226	1,730	660	8	17	0
9		351	820	129	6	0	24	171	1,370	660	12	5	0
10		470	820	111	9	0	25	199	1,200	700	19	4	0
11	111	620	820	114	12	0	26	226	982	700	14	2	3
12	114	660	780	148	8	0	27	178	860	660	4	5	0
13	151	740	740	125	0	0	28	190	780	740	2	6	0
14	182	1,020	660	96	0	0	29	171	780	620	23	1	0
15	194	1,110	700	72	0	0	30	167	1,020	491	24	0	0
							31		940		32	4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 11-30	240	111	185	7,340
May	1,730	159	838	51,500
June	940	334	714	42,500
July	438	2	117	7,190
August	41	0	9.6	590
September	9	0	1.6	95
The period				109,000

*Discharge, in second-feet, of Pioneer Canal near Woods, Wyo., 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		5	64	71	69	40	16	5	5	241	56	60	25
2		5	495	71	69	37	17	5	5	241	57	66	15
3		5	330	71	69	37	18	5	5	116	55	92	14
4		5	136	69	66	29	19	5	5	119	52	89	15
5		5	136	69	59	29	20	5	25	113	53	80	16
6		5	134	71	52	31	21	5	52	104	63	56	17
7		5	134	71	52	29	22	5	54	107	70	43	25
8		5	132	69	51	38	23	5	52	211	70	46	25
9		5	143	69	53	28	24	5	54	156	70	51	28
10		5	143	67	45	26	25	5	146	79	70	39	29
11	5	5	126	58	48	27	26	5	106	66	73	42	50
12	5	5	143	72	57	27	27	5	104	66	73	42	31
13	5	5	143	70	59	27	28	5	103	67	75	42	31
14	5	5	236	68	59	27	29	5	89	80	76	48	33
15	5	5	241	60	59	26	30	5	78	76	66	42	31
							31		62		67	45	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 11-30	5	5	5.0	198
May	146	5	32.9	2,020
June	495	64	153	9,100
July	76	52	66.8	4,110
August	92	39	56.5	3,470
September	40	14	27.0	1,610
The period				20,500

*Combined monthly discharge of Laramie River and Pioneer Canal near Woods, Wyo., 1932*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 11-30	245	116	190	7,540
May	1,780	164	871	53,600
June	1,070	567	867	51,600
July	509	77	184	11,300
August	133	42	66.1	4,060
September	49	16	28.7	1,710
The period				130,000

## LARAMIE RIVER NEAR LOOKOUT, WYO.

LOCATION.—Water-stage recorder in sec. 27, T. 21 N., R. 74 W., 9 miles northeast of Lookout.

DRAINAGE AREA.—2,100 square miles.

RECORDS AVAILABLE.—April 1915 to August 1917; April to September 1932.

EXTREMES.—Maximum discharge during year, 1,360 second-feet May 29 (gage height, 4.08 feet); minimum, 4 second-feet Sept. 29 (gage height, 1.03 feet).

1915-17, 1932: Maximum discharge, 3,100 second-feet June 26, 1917 (estimated); minimum, that of Sept. 29, 1932.

REMARKS.—Records good. Diversions for irrigation above station.

*Discharge, in second-feet, 1932*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		262	520	658	34	7	16		330	435	94	19	7
2		280	568	536	32	7	17		425	385	90	19	7
3		294	552	435	31	7	18		475	385	88	15	6
4		272	475	370	32	7	19		515	405	85	13	6
5		224	330	330	38	7	20		574	420	81	11	6
6		200	375	285	38	7	21		664	395	78	9	6
7		188	480	216	28	7	22		772	360	74	8	6
8		165	525	170	25	7	23		897	350	69	7	7
9		160	563	153	24	7	24		1,100	321	60	7	6
10		163	536	133	23	6	25		1,260	308	51	6	6
11		160	515	121	23	7	26		1,340	370	48	7	5
12		160	515	119	21	7	27		1,220	435	43	10	5
13		179	500	112	19	7	28		995	495	42	9	4
14		228	435	101	19	6	29		778	536	42	7	4
15		272	475	97	19	7	30	236	646	646	38	7	4
							31		530		37	7	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	1,340	160	507	31,200
June	646	308	455	27,100
July	658	37	157	9,650
August	34	6	18.3	1,130
September	7	4	6.3	375
The period				69,500

## 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 to November 1912; April 1913 to November 1916; October 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 86 second-feet Apr. 3 (gage height, 2.64 feet); no flow many days in July, August, September.

1912, 1915-16, 1920-32: Maximum discharge, 183 second-feet Aug. 22, 1915; no flow in 1916, 1932.

REMARKS.—Records fair. No record Dec. 1 to Feb. 29. Discharge estimated Mar. 3-15. Flow regulated by Wheatland Reservoir, capacity about 80,000 acre-feet.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	8	20	20	2	5	0.2	0	0
2	.3	8	16	37	2	4	.1	0	0
3	.3	8	15	86	4	2	0	0	0
4	.5	8	12	59	14	2	.2	0	0
5	.4	3	10	43	20	2	0	0	0
6	.6	8		42	13	2	0	0	0
7	1	8		52	8	3	0	0	0
8	1	8	8	47	8	2	0	0	0
9	2	8		46	6	2	0	0	0
10	2	8		36	6	3	0	0	0
11	2	8		31	4	4	0	0	0
12	2	8		40	4	3	0	0	0
13	2	9	12	45	4	3	0	0	0
14	2	10		33	3	2	0	0	0
15	3	10		26	4	1	0	0	0
16	2	9	20	27	4	2	0	0	0
17	3	7	25	20	4	1	0	0	0
18	3	3	30	15	5	2	0	0	0
19	4	5	35	9	6	2	0	0	0
20	4	8	35	5	7	2	0	0	0
21	4	8	34	2	7	2	0	0	0
22	5	7	34	2	5	2	0	0	0
23	6	6	29	3	4	2	0	0	0
24	6	6	25	3	4	2	0	0	0
25	7	7	25	2	4	1	0	0	0
26	7	6	22	2	4	.7	0	0	.2
27	7	7	16	2	6	.8	0	0	0
28	7	8	16	2	8	1	0	2	.2
29	8	7	18	2	8	.7	0	.7	.1
30	8	6	18	2	8	.4	0	.1	0
31	8		18		6		0	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	8	0.2	3.49	215
November	10	3	7.5	446
March	35		18.5	1,140
April	86	2	24.7	1,470
May	20	2	6.2	381
June	5	.4	2.05	122
July	.2	0	.02	1
August	2	0	.09	6
September	.2	0	.02	1

## 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 1932.

REMARKS.—Diversions for irrigation above station. During winter water is diverted 4 miles upstream for use of Lingle power plant; discharge is corrected for this diversion. Flow regulated by Wheatland Reservoir, capacity, about 80,000 acre-feet. Complete records furnished by United States Bureau of Reclamation.

*Discharge, in second-feet, 1931-32*

Day	* Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	40	110	110	128	130	160	131	280	94	43	14	15
2.....	43	110	108	130	128	160	131	280	73	43	14	16
3.....	45	110	108	130	128	150	146	155	73	43	14	15
4.....	39	115	110	145	130	90	581	203	63	54	14	16
5.....	39	116	110	122	128	84	650	327	63	38	14	16
6.....	40	104	110	120	138	86	480	380	54	73	14	16
7.....	40	98	110	115	138	84	459	370	45	36	14	16
8.....	45	97	110	128	140	74	427	380	36	36	14	16
9.....	52	103	110	130	165	74	326	334	30	44	14	15
10.....	69	109	110	132	180	96	265	290	30	45	13	15
11.....	69	109	110	135	195	114	240	290	25	45	13	16
12.....	71	109	108	130	145	105	221	279	23	44	13	17
13.....	82	109	86	106	150	146	176	260	20	26	13	17
14.....	77	109	90	84	130	148	144	355	24	24	17	17
15.....	71	103	115	100	130	170	144	218	24	24	13	16
16.....	63	103	115	120	130	175	157	224	15	22	13	16
17.....	58	103	120	128	150	160	172	219	15	20	13	16
18.....	83	103	115	128	145	160	184	183	17	20	13	16
19.....	74	103	135	130	150	160	186	160	95	20	13	16
20.....	78	103	140	142	160	185	174	140	74	15	12	17
21.....	95	83	140	145	180	185	154	140	65	15	12	16
22.....	95	72	140	130	190	185	133	165	53	15	13	17
23.....	89	68	135	135	195	185	139	147	39	15	13	17
24.....	94	88	150	132	200	185	158	130	36	15	13	17
25.....	95	86	145	135	155	185	198	94	35	15	13	20
26.....	95	97	160	135	155	185	150	84	37	15	13	21
27.....	101	98	175	140	140	185	198	74	36	15	13	22
28.....	95	98	130	125	150	160	235	74	39	15	13	22
29.....	120	98	140	110	150	160	209	76	61	15	15	25
30.....	125	110	110	110	-----	160	197	105	54	14	15	27
31.....	114	-----	110	110	-----	135	-----	130	-----	14	14	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	125	39	74.1	4,560
November.....	116	68	101	6,010
December.....	175	86	121	7,440
January.....	145	84	125	7,690
February.....	200	128	152	8,740
March.....	185	74	145	8,920
April.....	650	131	239	14,200
May.....	380	74	211	13,000
June.....	95	15	44.9	2,670
July.....	73	14	28.3	1,740
August.....	17	12	13.5	830
September.....	27	15	17.5	1,040
The year.....	650	12	106	76,800

## 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 1932.

EXTREMES.—Maximum discharge during year, 209 second-feet Aug. 2 (gage height, 4.6 feet); minimum, 4 second-feet Apr. 21, 22 (gage height, 1.30 feet).

1928-32: Maximum discharge, 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 Jan. 1 to Mar. 19. No diversions. Low-water flow represents return seepage from Interstate Canal.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	52	39	-----	-----	25	44	13	32	23	30	46
2	40	52	43	-----	-----		45	13	26	24	193	43
3	50	47	44	-----	-----		47	28	23	24	48	26
4	56	52	39	-----	-----		50	36	14	24	23	23
5	54	57	39	-----	-----		46	41	14	23	33	35
6	51	52	38	-----	-----	15	44	28	16	18	30	36
7	53	57	40	-----	-----		19	30	26	18	33	30
8	56	57	41	-----	-----		19	10	30	19	30	29
9	66	55	36	-----	-----		18	13	15	19	30	21
10	70	57	42	-----	-----		19	13	20	17	27	28
11	68	55	41	-----	-----	20	18	14	20	24	30	37
12	56	54	40	-----	-----		18	13	20	21	29	41
13	48	56	42	-----	-----		17	23	21	17	33	42
14	51	56	38	-----	-----		19	21	27	19	40	32
15	48	55	38	-----	-----		19	20	26	16	42	41
16	48	52	21	-----	-----	30	16	13	102	16	41	72
17	52	55	19	-----	-----		9	13	27	15	40	30
18	49	52	15	-----	-----		5	13	28	15	33	38
19	50	44	15	* 17	* 13		5	17	30	17	31	36
20	48	41	15	-----	-----		46	5	39	42	31	39
21	51	38	17	-----	-----	48	4	40	36	23	24	42
22	47	34	15	-----	-----	48	4	40	31	20	26	44
23	47	31	17	-----	-----	50	16	39	25	21	23	40
24	47	29	17	-----	-----	50	30	38	21	24	22	40
25	51	29	15	-----	-----	48	14	36	28	28	37	40
26	47	34	15	-----	-----	48	13	30	21	30	34	40
27	50	33	16	-----	-----	47	31	36	16	30	41	35
28	50	34	16	-----	-----	47	24	31	16	28	39	30
29	47	34	15	-----	-----	47	21	31	20	32	40	29
30	47	30	15	-----	-----	47	13	26	21	28	28	29
31	47	-----	15	-----	-----	46	-----	38	-----	27	45	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	70	30	50.8	3,120
November	57	29	46.1	2,740
December	44	15	27.7	1,700
January	-----	-----	15	922
February	-----	-----	18	1,040
March	50	-----	32.0	1,970
April	50	4	21.7	1,290
May	41	10	25.7	1,580
June	102	14	26.5	1,590
July	32	15	21.9	1,850
August	193	22	38.3	2,360
September	72	21	36.3	2,160
The year	193	4	30.0	21,800

\* Result of discharge measurement.



## KATZER DRAIN NEAR HENRY, NEBR.

LOCATION.—Staff gage in sec. 12, T. 23 N., R. 60 W., 3 miles southwest of Henry.  
RECORDS AVAILABLE.—June 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 1,000 second-feet May 20 (gage height, 10.0 feet); minimum occurred during winter.

1928-32: Maximum discharge, 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 Nov. 21 to Mar. 19. 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, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	13				5	7	12	28	40	42
2	9	12				5	7	12	25	35	44
3	9	13			6	4	6	13	23	39	43
4	9	13				5	6	15	23	38	45
5	9	14				6	51	18	25	35	42
6	9	13				6	21	16	26	35	35
7	11	13				6	17	15	25	40	43
8	11	13			3	6	15	17	24	38	41
9	10	14				8	15	20	21	38	39
10	9	13				7	14	21	22	38	43
11	10	14				7	12	21	24	41	44
12	11	32				7	13	24	29	40	40
13	10	14			4	6	15	21	33	40	42
14	9	14				7	14	19	37	40	43
15	9	15				6	16	22	38	33	44
16	9	14			7	6	15	26	39	33	43
17	9	14			7	6	14	26	39	36	40
18	9	14			7	6	15	23	43	39	40
19	10	14	a 6	a 2	7	6	15	21	38	42	40
20	9	14			7	6	81	24	33	40	41
21	12				6	6	113	20	30	42	41
22	10				6	6	21	18	34	44	40
23	9	12			6	8	21	17	33	42	40
24	9				5	9	18	17	37	39	41
25	10				5	7	19	17	42	47	43
26	9				5	7	17	18	38	47	32
27	9				4	9	15	23	35	45	35
28	10	10			5	8	18	22	38	42	35
29	11				5	7	16	24	39	45	33
30	12				6	7	18	26	38	46	34
31	13				5		16		41	38	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13	9	9.8	608
November	32		13.3	791
December			8	492
January			5	307
February			4	230
March	7		5.1	314
April	9	4	6.5	387
May	113	6	21.3	1,310
June	26	12	19.6	1,170
July	43	21	32.3	1,990
August	47	33	39.9	2,450
September	45	32	40.3	2,400
The year	113		17.1	12,400

\* Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 34 second-feet Oct. 30 (gage height, 1.15 feet); no flow several days during summer.

1928-32: Maximum discharge, 455 second-feet June 8, 1929 (gage height, 4.59 feet); no flow several days during summers of 1929 and 1932.

REMARKS.—Records fair. Discharge for period Nov. 26 to Mar. 15 based on five discharge measurements and temperature records. Diversions for irrigation above station. Flow regulated by Hawk Springs Reservoir, capacity, 19,400 acre-feet.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0.6	22				5	11	2	0.3	0	0	0.7
2.....	.6	19				5	14	1	.3	0	.1	.6
3.....	.6	17		10	20	5	14	1	.3	0	.1	.4
4.....	.5	17				4	16	1	.3	0	.1	.6
5.....	.5	22				4	15	2	.3	0	.1	.4
6.....	.6	23				5	16	.6	.3	0	.1	.5
7.....	.8	24				6	14	.4	.3	0	.1	.4
8.....	1	22		15	31	5	14	.3	.3	0	.1	.3
9.....	.8	17				4	17	.2	.3	.1	.1	.2
10.....	.8	17				3	14	.2	.3	.1	.1	.2
11.....	.8	19					13	.3	.3	.1	.1	.2
12.....	1	19					12	.3	.3	.1	.7	.2
13.....	.9	18		12	20	2	11	.4	.4	.1	1	.1
14.....	.8	12					10	.3	.4	.2	.8	.9
15.....	1	8					10	.3	.4	.2	.9	.5
16.....	.9	4			20	11	9	.4	1	.1	1	.4
17.....	.9	5			22	7	9	.3	.4	.1	1	.6
18.....	7	13			22	5	9	.2	.4	.1	1	.5
19.....	8	11		5	24	4	9	.2	.4	1	1	.2
20.....	4	4		8	24	4	8	.2	.4	0	2	.3
21.....	6	3		10		6	8	.2	.3	.1	.9	.6
22.....	3	2			24	4	8	.1	.3	.1	.8	1
23.....	3	5				4	8	.1	.1	.1	.8	.9
24.....	4	2			24	4	8	.1	.1	.1	.8	.8
25.....	2	.8			20	5	6	.1	.1	.1	.8	1
26.....	7			12	18	4	4	.4	0	.6	.2	
27.....	12	1			14	4	4	.6	.2	.1	.9	2
28.....	12				9	4	3	.4	.4	.1	1	1
29.....	17			10	7	4	2	.4	.3	.1	.9	2
30.....	31					8	2	.3	.1	.1	.8	2
31.....	28					10		.4		.1	.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	31	0.5	5.07	312
November.....	24		11.0	655
December.....			4.0	246
January.....			11.2	689
February.....		7	21.8	1,250
March.....	11		4.6	283
April.....	17	2	9.9	589
May.....	2	.1	.47	29
June.....	1	0	.32	19
July.....	2	0	.07	4
August.....	2	0	.63	39
September.....	2	.2	.75	45
The year.....	31	0	5.74	4,160

## 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 1932.

EXTREMES.—Maximum discharge during year, 508 second-feet June 21 (gage height, 4.00 feet); minimum, 13 second-feet Jan. 6 (discharge measurement). 1930-32: Maximum discharge, that of June 21, 1932; minimum, that of Jan. 6, 1932.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Feb. 2, Mar. 4, 10, 12, May 5, 20. Numerous small diversions above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50			15	40	25	21	22	74	67	256	117
2	38				40	21	23	23	89	78	232	134
3	50				42	25	22	21	45	81	182	112
4	50				31	26	22	19	40	67	137	108
5	50	* 30			31	28	21	400	89	85	128	117
6	50			13	55	28	24	64	78	81	119	104
7	56				58	19	22	97	40	74	97	97
8	50		* 67		55	47	22	47	42	67	114	74
9	50			20	108	47	32	29	50	61	114	110
10	50				172	45	27	25	52	67	102	102
11	41				114	45	23	21	50	78	89	151
12	47				132	40	23	18	64	74	102	114
13	41			25	119	18	22	17	85	93	123	156
14	35				52	40	19	16	74	93	102	106
15	35				67	19	19	16	128	97	119	137
16	35				47	61	19	16	366	33	97	156
17	35				66	45	19	16	436	146	119	151
18	35			30	64	34	19	16	490	172	119	151
19	35				66	32	19	15	454	119	119	123
20	35				70	39	18	350	508	110	119	166
21	47				66	33	18	25	508	95	119	156
22	41				83	33	18	31	366	112	102	151
23	35			35	76	20	67	22	326	125	89	182
24	35				55	28	52	26	185	154	97	182
25	35				68	26	33	40	114	134	102	70
26	35			39	54	25	28	26	87	123	106	238
27	35			38	46	25	29	29	70	137	119	210
28	35			40	34	23	26	45	85	110	137	232
29	26			35	30	23	26	29	55	151	156	204
30	35			35		23	26	35	67	161	151	166
31	47			40		22		97		300	146	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	56	26	41.1	2,530
November			43	2,560
December			39	2,400
January	40	13	27.3	1,680
February	172	30	66.9	3,850
March	61	18	31.1	1,910
April	67	18	25.3	1,510
May	400	15	53.3	3,280
June	508	40	171	10,200
July	300	33	108	6,640
August	256	89	126	7,750
September	238	70	143	8,510
The year	508	13	72.6	52,800

\* 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 1932.

EXTREMES.—Maximum discharge during year not determined (gage height, 6.75 feet, owing to break in Interstate Canal); minimum, 1 second-foot June 1, 7, 18, 20 (gage height, 1.12 feet).

REMARKS.—Records fair. Gage read on alternate days July 16 to Sept. 30. During irrigation season all flow at a point  $1\frac{1}{4}$  miles above station is diverted.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	4			80	69	75	69	72	2	2	5	4
2.....					72	75	69	69	2	3	200	4
3.....					69	75	69	69	2	3	120	4
4.....					72	75	69	69	2	3	60	4
5.....					75	75	69	96	2	4	5	4
6.....	105		85		75	75	72	144	2	4	4	4
7.....					81	75	69	96	2	4	4	4
8.....					75	72	72	81	2	5	4	4
9.....					84	75	90	75	2	5	4	4
10.....					84	75	72	72	2	5	4	4
11.....	110	90		78	69	72	72	69	2	6	3	4
12.....					72	75	84	69	2	5	3	3
13.....					72	75	72	66	2	8	3	3
14.....					72	78	69	63	2	7	4	3
15.....					72	75	72	69	2	7	4	3
16.....	115			78	72	78	69	66	2	7	4	3
17.....					72	75	69	63	2	6	4	3
18.....					69	75	72	63	1	6	4	3
19.....					72	75	72	35	2	6	4	3
20.....					72	81	69	54	1	6	4	3
21.....	90		82	75	75	78	69	36	2	6	5	4
22.....					75	75	69	2	2	6	4	5
23.....					75	75	90	2	2	6	2	4
24.....					75	72	84	2	2	6	4	3
25.....					75	72	75	2	2	6	5	4
26.....	105	85		72	75	75	69	2	2	6	4	4
27.....				72	78	75	75	3	2	7	4	5
28.....				75	72	72	84	4	2	7	4	6
29.....				72	72	72	78	3	3	7	4	6
30.....				69	69	69	75	2	2	7	4	60
31.....				67		69		2		6	4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....			92.7	5,700
November.....			89.2	5,310
December.....			83.5	5,130
January.....			76.6	4,710
February.....	84	69	73.9	4,250
March.....	81	69	74.5	4,580
April.....	90	69	73.6	4,380
May.....	144	2	49.0	3,010
June.....	3	1	2.0	119
July.....	8	2	5.5	338
August.....	200	2	15.8	972
September.....	60	3	5.7	339
The year.....	200	1	53.5	38,800

## 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 1932.

EXTREMES.—Maximum discharge during year, 135 second-feet Sept. 21, estimated (gage height, 2.30 feet); minimum, 5 second-feet May 20, June 9, 12 (gage height, 0.56 foot).

REMARKS.—Records fair. Discharge estimated Oct. 1 to Jan. 26. Gage read on alternate days July 17 to Sept. 30. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	63	60	56	55	53	52	52	19	24	109	67
2					55	53	52	52	20	9	101	106
3					55	52	52	51	20	14	28	116
4					55	55	52	48	25	17	29	123
5					55	54	54	48	30	15	22	92
6	90	63	63	56	55	53	54	58	31	15	23	77
7					53	54	52	55	18	25	26	50
8					53	53	54	53	17	44	30	74
9					53	53	54	48	7	52	65	73
10					42	55	54	48	7	41	44	97
11	80	62	60	56	50	53	53	47	9	44	66	77
12					50	52	53	46	6	48	33	56
13					50	53	53	46	23	71	49	48
14					50	52	52	46	21	91	36	84
15					52	52	44	77	11	84	63	85
16	70	62	58	56	53	51	44	66	18	45	61	97
17					53	50	44	74	6	61	69	79
18					53	49	42	71	11	65	44	78
19					53	48	42	52	18	105	46	95
20					53	49	42	5	32	97	39	87
21	65	61	58	56	53	49	48	75	32	88	75	135
22					53	49	50	52	32	32	80	122
23					53	49	52	30	32	48	90	74
24					53	51	62	25	29	52	71	87
25					52	51	58	25	19	52	67	69
26	65	61	58	57	52	51	56	23	14	83	63	93
27					52	51	53	14	15	85	87	91
28					55	52	52	13	26	46	106	105
29					55	52	52	52	11	53	116	124
30					53	52	51	23	8	60	75	120
31				55		51		21		111	71	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October			80.4	4,940
November			62.0	3,690
December			59.1	3,630
January			55.8	3,430
February	55	42	52.4	3,010
March	55	48	51.7	3,180
April	62	42	51.1	3,040
May	77	5	45.0	2,770
June	32	6	18.9	1,120
July	111	9	54.1	3,330
August	116	22	60.8	3,740
September	135	48	89.7	5,340
The year	135	5	56.8	41,200

## GERING DRAIN NEAR GERING, NEBR.

LOCATION.—Staff gage on line between secs. 5 and 6, T. 21 N., P. 54 W., 2 miles east of Gering.

RECORDS AVAILABLE.—October 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 157 second-feet June 24 (gage height, 3.46 feet); minimum, 18 second-feet May 25 (gage height, 1.14 feet).  
1931-32: Maximum discharge, that of June 24, 1932; minimum, that of May 25, 1932.

REMARKS.—Records fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61				22	23	23	22	56	48	96	76
2	67				22	25	23	23	48	48	82	76
3	58				22	24	24	23	50	58	82	67
4	34				22	23	23	24	43	56	70	56
5	43				22	25	23	22	48	58	79	79
6	36				22	25	23	22	48	46	64	70
7	56				21	24	23	20	58	56	61	70
8	56				26	23	23	24	38	56	64	86
9	53				26	25	28	23	40	56	79	76
10	53				27	24	24	22	46	50	58	82
11	43				22	24	24	23	43	61	61	86
12	50				22	25	24	20	53	89	61	89
13	48				22	23	24	20	61	64	64	86
14	46				22	29	23	20	67	64	64	79
15	46				23	29	22	27	67	61	64	73
16	43				22	23	22	21	96	64	58	76
17	36				22	24	22	20	110	110	58	82
18	36				22	24	22	20	110	82	58	70
19	36				23	23	22	20	141	82	64	70
20	34				22	26	22	20	141	89	58	76
21	33				25	28	22	20	125	79	64	64
22	33				24	24	21	20	73	70	58	64
23	34				24	24	38	50	89	70	70	70
24	32				24	24	29	33	157	89	67	76
25	36				24	23	29	18	110	96	61	82
26	31				22	24	24	20	53	96	61	64
27	31				22	24	24	26	61	89	61	70
28	32				22	24	24	28	48	50	70	110
29	32				22	24	24	28	53	61	86	70
30	31				22	24	24	58	56	82	67	96
31	31				22	24	103	103	96	70	70	---

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	67	31	41.6	2,560
November			29.7	1,770
December			27.0	1,660
January			23.0	1,410
February	27	21	23.2	1,330
March	29	23	24.5	1,510
April	38	21	24.5	1,460
May	103	18	28.6	1,760
June	157	38	73.3	4,360
July	110	46	71.6	4,400
August	96	58	66.5	4,090
September	110	56	77.0	4,580
The year	157	18	42.5	30,900

## 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 to September 1932.

EXTREMES.—Maximum discharge during period, 385 second-feet Aug. 13 (gage height, 3.08 feet); minimum, 81 second-feet May 13, 14 (gage height, 0.77 foot).

REMARKS.—Records good. Discharge estimated Feb. 17–22, Mar. 7–9. Return flow from irrigated lands.

*Discharge, in second-feet, 1932*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		93	93	90	88	113	152	294	232
2		93	93	90	86	113	156	204	256
3		93	93	90	86	119	156	176	232
4		93	93	90	86	116	163	294	212
5		93	90	90	86	122	163	176	204
6		93	90	90	88	122	163	176	212
7		93	88	88	86	122	152	212	212
8		93	88	88	86	128	160	204	204
9		96	90	88	83	122	152	190	204
10		98	96	86	84	132	160	212	212
11		98	93	86	86	135	156	204	212
12		98	96	86	86	132	160	222	212
13		98	101	88	81	138	168	385	232
14		98	98	86	81	142	178	270	256
15		98	96	83	83	142	172	232	244
16		98	96	83	83	146	178	212	232
17		98	96	86	83	160	190	204	232
18		98	96	88	83	172	190	204	232
19		97	96	86	86	168	183	244	232
20		97	96	83	107	168	178	212	232
21		96	98	83	107	160	172	212	222
22		96	96	83	93	160	190	222	222
23		96	96	128	93	160	190	190	232
24		96	93	98	86	146	183	190	256
25		93	93	98	90	152	196	222	256
26		93	93	88	93	156	178	222	256
27		93	93	88	96	152	190	244	232
28		93	93	96	98	149	212	244	232
29	93	96	90	90	104	156	212	232	232
30	88	90	88	88	104	156	212	204	315
31	90	90	90	107	107	212	212	244	212

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February	98	93	95.4	5,490
March	101	83	93.6	5,760
April	128	83	89.5	5,330
May	107	81	90.0	5,530
June	172	113	142	8,450
July	212	152	177	10,900
August	385	190	220	13,500
September	315	204	232	13,800
The period				68,800

## BAYARD SUGAR-FACTORY DRAIN NEAR BAYARD, NEB.

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 1932.

EXTREMES.—Maximum discharge during year, 100 second-feet Sept. 11, 18, 19, 24, 30; maximum gage height, 2.00 feet Sept. 24, 30; minimum discharge, 4 second-feet June 9 (gage height, 0.38 foot).

REMARKS.—Records good except those for Oct. 1 to Jan. 29, which were estimated, and Mar. 1-18, which were based on one discharge measurement. Some diversions above gage.

## Discharge, in second-feet, 1931-32

Day	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	52	46	37	35	34	33	50	34	50	84
2				40		34	33	39	32	50	84
3				44		34	31	33	33	47	84
4				39		34	31	27	33	47	84
5				43		34	31	24	33	64	84
6	70		44	43	34	33	30	7	32	47	80
7				38		33	29	7	26	64	88
8				37		31	30	7	28	72	96
9				36		31	29	4	25	72	80
10				38		31	27	5	25	57	68
11	65	50	42	39	35	30	28	5	37	43	100
12				39		30	28	10	37	42	92
13				39		30	28	16	38	80	92
14				37		30	27	17	39	64	92
15				37		30	28	34	28	68	92
16	60			36		30	27	50	31	60	88
17				36		30	42	50	64	57	92
18				36		30	37	57	64	57	100
19				37	35	28	34	68	64	72	100
20				39	36	28	30	68	32	68	92
21	55	48	40	37	35	26	50	57	32	68	88
22				34	35	25	42	25	33	64	92
23				34	35	37	41	22	36	64	92
24				33	33	40	42	22	33	72	100
25				36	34	40	35	21	33	64	96
26	53			34	35	36	50	19	37	80	96
27				34	35	34	54	19	37	84	92
28				36	36	36	64	23	34	88	88
29				37	35	37	68	18	37	84	92
30				39	35	37	68	57	37	84	100
31			39		35		60		44	84	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October			62.7	3,860
November			52	3,090
December			49.9	3,070
January		39	42.2	2,590
February	44	33	37.4	2,150
March			34.8	2,140
April	40	25	32.4	1,930
May	68	27	38.3	2,360
June	64	4	26.7	1,719
July	64	25	36.4	2,240
August	88	42	65.1	4,000
September	100	68	90.3	6,370
The year	100	4	47.5	34,500

\* Interpolated.



## 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 to September 1932. October 1930 to September 1931 at station 1 mile upstream, above mouth of Wild Horse Drain.

EXTREMES.—Maximum discharge during year, 1,320 second-feet May 27 (gage height, 6.4 feet); minimum discharge, 36 second-feet June 7, 10 (gage height, 0.52 foot).

REMARKS.—Records fair. Numerous small diversions above station.

*Discharge, in second-feet, 1932*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		66	62	56	56	110	53	160	103
2		65	59	57	54	110	54	145	97
3		64	59	57	56	70	65	145	97
4		68	53	56	52	50	57	91	116
5		66		59	54	44	61	91	103
6		66	55	57	54	40	54	80	97
7		67		57	56	39	58	86	97
8		70		57	50	46	55	75	97
9		75		60	56	50	42	80	75
10		76	75	56	48	37	66	75	103
11		68	70	55	48	48	57	70	123
12		68	70	54	48	56	56	75	110
13		66	70	55	45	48	56	145	110
14		61	69	52	47	50	59	145	116
15		65	67	52	48	39	66	97	116
16		65	66	52	44	42	130	80	110
17		63	66	54	97	40	202	80	123
18		65	66	56	260	152	86	80	116
19		66	65	52	230	130	70	91	116
20		64	66	52	250	123	75	103	97
21		63	65	52	450	145	70	103	91
22		63	64	50	130	160	75	103	116
23		62	62	75	130	138	138	86	116
24		61	61	70	123	145	145	86	130
25		61	61	80	69	86	86	97	145
26		61	60	70	53	54	75	91	145
27		61	61	63	75	110	75	91	152
28		61	61	68	130	46	75	168	145
29			59	65	184	50	103	103	152
30		68	57	59	202	53	66	103	145
31			56		211		193	103	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February	76	61	65.2	3,750
March	75	53	62.3	3,830
April	80	50	58.5	3,480
May	450	44	110	6,760
June	160	37	76.8	4,570
July	202	53	82.6	5,080
August	168	70	101	6,210
September	152	91	116	6,900
The period				40,600

## 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 1932.

EXTREMES.—Maximum discharge during year, 200 second-feet (estimated) June 16 (gage height, 3.78 feet); minimum, 8 second-feet Aug. 11 (gage height, 0.98 foot).

1930-32: Maximum discharge, that of June 16, 1932; minimum, 1 second-foot May 30 to Aug. 11, 1931.

REMARKS.—Records fair. Discharge estimated November to February. Discharge represents chiefly return seepage flow. Several diversions above station for irrigation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31					52	50	52	23	33	44	13
2	31					52	50	47	18	33	47	13
3	31	" 40				52	50	47	18	22	35	13
4	29					54	50	47	17	20	21	13
5	29					54	44	47	16	20	21	13
6	29	" 24			" 34	54	44	47	18	20	20	13
7	28					54	44	60	19	13	9	13
8	31					54	37	42	17	15	12	13
9	31			" 34		60	44	42	14	15	12	13
10	29	" 37				60	29	42	15	16	12	12
11	26					57	29	37	15	16	8	13
12	26					57	28	37	19	17	8	13
13	26					47	28	37	18	17	13	13
14	27					47	31	37	18	18	8	13
15	27					63	28	19	18	18	22	13
16	27		" 42			63	28	19	20	24	22	13
17	29					63	31	19	63	50	25	13
18	27					63	29	19	63	44	25	13
19	27					63	37	19	60	29	25	13
20	27					63	37	19	60	27	25	13
21	29					60	35	20	60	24	22	13
22	29					63	37	23	54	42	24	13
23	29					63	40	20	50	42	19	13
24	29				" 6	63	52	19	50	33	19	13
25	31					60	52	19	33	31	19	13
26	33				" 50	54	52	18	33	33	19	14
27	29			" 33		54	52	18	33	33	19	13
28	29					54	52	18	44	31	10	13
29	42					52	52	29	44	33	10	13
30	63					52	52	22	33	33	11	13
31	63					52		18		35	13	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	63	26	31.4	1,930
November			38	2,260
December			40	2,460
January			34	2,090
February			32	1,840
March	63	47	56.7	3,490
April	52	28	40.8	2,430
May	60	18	30.9	1,900
June	200	14	38.1	2,270
July	50	13	27.0	1,660
August	47	8	19.3	1,190
September	14	12	13.0	774
The year	200		33.5	24,300

\* 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 1932.

EXTREMES.—Maximum discharge during year, 310 second-feet Apr. 24; minimum, 0.7 second-foot July 13 (gage height, 0.71 foot).

1930-32: Maximum discharge, that of Apr. 24, 1932; minimum, that of July 13, 1932.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Feb. 28, Mar. 5-15. Small diversions upstream.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.		
1.....	70	90	141	120	110	110	122	116	22	58	2	8		
2.....	74	88	140			120	105	122	122	16	53	1	16	
3.....	74	90					110	110	122	116	4	50	1	23
4.....	74							122	116	5	38	1	25	
5.....	70							122	122	6	19	1	27	
6.....	74	100	135	110	120	100	122	116	5	3	1	28		
7.....	74						122	110	3	1	5	26		
8.....	74						128	110	2	3	4	28		
9.....	74						122	116	1	5	1	28		
10.....	74						122	110	14	5	1	28		
11.....	79	110	135	110	120	110	122	105	94	2	1	31		
12.....	74						122	105	146	1	1	32		
13.....	74						122	94	116	1	208	30		
14.....	74						120	110	84	89	1	116	29	
15.....	74						130	105	84	64	1	74	26	
16.....	74	120	135	120	120	140	100	79	74	3	60	24		
17.....	84					122	94	74	128	7	49	23		
18.....	79					116	100	74	122	8	40	21		
19.....	79					116	100	62	128	8	36	22		
20.....	74					122	94	62	128	6	35	20		
21.....	74	110	135	125	120	116	79	57	105	2	29	18		
22.....	79					116	89	48	100	3	17	20		
23.....	79					116	236	30	94	8	13	25		
24.....	74					120	116	295	8	94	7	8		
25.....	74					120	116	153	8	84	4	5	31	
26.....	74	120	130	120	115	116	128	24	74	2	13	33		
27.....	74					116	122	26	79	1	84	36		
28.....	74					116	140	49	89	1	84	35		
29.....	74					122	134	61	84	4	60	39		
30.....	84					116	116	64	70	5	47	39		
31.....	84					116		52		2	23			

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	84	70	75.5	4,640
November.....			108	6,430
December.....			135	8,300
January.....			118	7,260
February.....			118	6,790
March.....	140		113	6,950
April.....	295	79	126	7,500
May.....	122	8	77.5	4,770
June.....	146	1	68.0	4,050
July.....	58	1	10.1	621
August.....	208	1	32.9	2,020
September.....	39	8	26.7	1,590
The year.....	295	1	83.9	60,900

## BIRDWOOD CREEK NEAR HERSHEY, NEBR.

LOCATION.—Staff gage in sec. 2, T. 14 N., R. 33 W., 1 mile (revised) above mouth and 5 miles northwest of Hershey.

DRAINAGE AREA.—286 square miles.

RECORDS AVAILABLE.—January 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 320 second-feet June 11 (gage height, 2.70 feet); minimum, 87 second-feet Aug. 25 (gage height, 2.06 feet).

1931-32: Maximum and minimum discharges, those of June 11 and Aug. 25, 1932.

REMARKS.—Records fair. Small diversions upstream.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	157	170		175	150	180	195	160	131	112	160	131
2	157						181	160	125	115	141	141
3	144						178	160	120	141	141	141
4	157						188	160	120	118	134	174
5	144						188	154	120	107	138	178
6	128		185			180	181	154	112	120	144	181
7	128						178	147	105	115	134	178
8	128						184	154	110	115	134	184
9	128						181	147	112	128	134	157
10	154						184	154	170	115	144	170
11	154			185	170		174	154	259	123	141	181
12	154						178	150	195	118	138	199
13	160						174	147	134	115	280	174
14	154						170	150	134	112	195	178
15	154						164	147	141	110	147	170
16	154	175	205			219	164	160	134	141	141	164
17	147					192	174	150	192	141	141	154
18	154					203	207	150	160	150	138	147
19	141					199	203	138	275	107	141	157
20	154					219	192	118	199	115	141	144
21	154		200	160		195	195	128	157	98	123	167
22	154					178	192	138	138	105	123	164
23	154					178	227	118	131	141	105	164
24	154					164	227	112	138	164	91	157
25	154					192	199	125	128	170	98	157
26	160	185	190	150	180	181	167	251	134	154	110	192
27	154					203	164	181	141	138	219	184
28	170					199	191	154	134	110	164	174
29	184					195	191	157	131	107	160	178
30	192					203	199	154	110	128	128	178
31	178					211		157		184	141	
Month	Maximum		Minimum		Mean		Run-off in acre feet					
October	192		128		154		9,470					
November					175		10,400					
December					192		11,800					
January					163		10,000					
February					170		9,780					
March	219		164		188		11,600					
April	227		164		186		11,100					
May	251		112		151		9,280					
June	275		105		146		8,690					
July	184		98		126		7,750					
August	280		91		144		8,850					
September	199		131		167		9,940					
The year	280		91		163		119,000					

## LINCOLN COUNTY DRAIN AT NORTH PLATTE, NEBR.

LOCATION.—Staff gage on east line of sec. 30, T. 14 N., R. 30 W., 1 mile north-west of North Platte and half a mile above mouth.

RECORDS AVAILABLE.—March 1931 to September 1932.

REMARKS.—Records fair. Gage read on alternate days July 19 to Sept. 30. Records represent chiefly return flow from irrigated area.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	85	70	55	55	50	40	45	40	103	100	115	122
2.....	85								105	100	112	124
3.....	84								107	108	109	122
4.....	80								109	107	105	121
5.....	79	70	55	55	50	40	45	40	113	99	101	120
6.....	59								109	102	103	119
7.....	83								105	98	105	120
8.....	86								103	94	104	120
9.....	86	70	55	55	50	40	45	40	103	100	103	118
10.....	83								99	105	104	117
11.....	83								107	105	105	116
12.....	80								111	100	104	115
13.....	79	60	54	50	55	45	40	80	111	102	102	113
14.....	77								111	102	102	111
15.....	76								107	97	103	109
16.....	75								105	97	104	107
17.....	74	55	54	50	55	45	40	80	99	95	106	106
18.....	75								102	92	104	106
19.....	75								113	96	102	102
20.....	89								103	99	100	99
21.....	87	55	54	50	55	45	40	80	105	98	99	98
22.....	88								105	97	101	97
23.....	90								110	100	103	98
24.....	88								103	102	100	99
25.....	88	55	54	50	55	45	40	80	99	102	97	98
26.....	88								100	102	102	97
27.....	77								102	102	107	94
28.....	72								102	102	112	91
29.....	101	55	54	50	55	45	40	80	95	100	117	90
30.....	69								103	99	118	89
31.....	80								107	119	119	89

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	101	59	81.3	5,000
November.....			61.7	3,670
December.....			54.3	3,340
January.....			52.4	3,220
February.....			51.7	2,970
March.....			45.0	2,770
April.....			42.5	2,530
May.....			62.6	3,850
June.....	113	95	105	6,250
July.....	108	92	100	6,150
August.....	119	97	105	6,460
September.....	124	89	108	6,430
The year.....	124		72.6	52,600

## 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 about 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 1932.

EXTREMES.—Maximum discharge during year, 306 second-feet Apr. 25 (gage height, 2.60 feet); minimum occurred during winter.

1930-32: Maximum discharge, 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 Nov. 20 to Apr. 14, 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, 1931-32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	20	174	15	5	40	73	43	144	119	66
2.....	7	205				53	31	201	126	64
3.....	5	212				49	40	203	96	60
4.....	4	205				31	63	157	69	56
5.....	4	203	10	5	50	26	99	138	76	53
6.....	4	212				23	59	126	58	49
7.....	3	225				23	40	117	50	46
8.....	3	223				21	35	106	43	43
9.....	3	218	5	8	166	19	40	94	37	43
10.....	70	196				19	65	94	31	39
11.....	181	179				19	94	106	29	37
12.....	81	170				17	94	119	28	38
13.....	89	172	5	18	166	17	108	174	38	35
14.....	90	148				18	82	212	41	33
15.....	87	144				25	75	128	106	31
16.....	84	161				25	106	105	106	31
17.....	82	163	5	30	280	179	31	174	69	106
18.....	86	166				181	30	183	92	170
19.....	90	170				150	31	142	136	234
20.....	90	165				142	114	136	94	234
21.....	94	100	5	40	270	81	115	65	227	10
22.....	97					223	62	123	50	245
23.....	99					227	99	94	47	227
24.....	101					212	101	190	75	188
25.....	101	75	5	40	130	89	185	97	136	32
26.....	97					89	229	108	106	39
27.....	39					79	247	70	166	39
28.....	14					69	62	174	60	115
29.....	69	166	5	40	74	49	205	73	110	39
30.....	166					41	148	174	79	56
31.....	174					43		132	65	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	181	3	68.8	4,230
November.....	225		153	9,100
December.....			7.4	455
January.....			4	246
February.....			5	288
March.....			18.4	1,130
April.....	280		114	6,780
May.....	114	17	47.1	2,900
June.....	247	31	114	6,780
July.....	203	47	115	7,070
August.....	245	28	112	6,890
September.....	66	9	36.8	2,190
The year.....	280		66.2	48,100

## 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 1932.

EXTREMES.—Maximum discharge during year, 1,020 second-feet July 30 (gage height, 3.54 feet); minimum, 14 second-feet Mar. 11.

1902-32: Maximum discharge, 6,320 second-feet June 7, 1921 (gage height, 8.95 feet); minimum, that of Mar. 11, 1932.

REMARKS.—Records good except those for Nov. 22 to Apr. 7, which were based on four 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, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	203	134	70	65	88	120	98	293	478	685	670	250
2.....	222	134				100	99	390	474	635	528	224
3.....	236	303	68	53	100	89	108	418	496	630	514	224
4.....	216	213				95	121	363	510	615	435	203
5.....	203	142				75	113	344	523	595	363	203
6.....	195	134	67	58	100	126	348	546	528	344	203	
7.....	190	134				124	330	610	514	326	190	
8.....	188	136				114	320	630	675	309	171	
9.....	193	142				110	309	635	568	290	171	
10.....	216	146	70	60	110	102	326	568	615	277	178	
11.....	233	141				14	101	326	568	660	244	168
12.....	247	131				28	109	340	665	685	247	162
13.....	247	124				47	114	370	706	750	284	148
14.....	230	125				93	230	348	700	870	193	144
15.....	180	128	65	54	108	79	287	386	650	940	274	144
16.....	168	128				313	402	645	780	374	190	
17.....	155	108				271	443	615	590	546	216	
18.....	153	107				262	474	615	550	443	216	
19.....	157	118				290	518	706	469	496	213	
20.....	185	99				287	514	728	600	620	213	
21.....	206	109	78	51	110	300	568	670	582	650	198	
22.....	219	56				306	756	635	487	439	190	
23.....	219	48				333	792	620	426	474	178	
24.....	227	18				300	675	595	406	496	200	
25.....	222	38				287	660	610	402	340	238	
26.....	216	66	83	80	120	300	625	670	367	370	198	
27.....	211	77				256	595	792	382	367	195	
28.....	188	76				259	605	891	460	363	208	
29.....	180	74				293	600	798	469	370	238	
30.....	130	77				326	528	700	768	323	227	
31.....	125					492	492		792	268		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	247	125	199	12,200
November.....	303	18	116	6,900
December.....			72.5	4,460
January.....			61.5	3,780
February.....			106	6,100
March.....			86.9	5,340
April.....	333	98	211	12,600
May.....	792	293	466	28,700
June.....	891	474	635	37,800
July.....	940	367	597	36,700
August.....	670	193	395	24,300
September.....	250	144	197	11,700
The year.....	940	14	262	191,000

## 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 1932. Records October 1914 to September 1930 published by State engineer.

EXTREMES.—Maximum discharge during year, 903 second-feet Jan. 12; minimum, 16 second-feet Sept. 15, 16.

1902-32: Maximum discharge, 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, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	61	308	97	505	344	184	209	40	35	28	25
2	53	57	300	105	500	314	134	208	40	27	28	20
3	55	57	276	117	500	282	94	173	31	27	28	21
4	51	57	257	148	490	250	77	173	29	27	28	20
5	48	57	270	213	490	225	63	176	37	27	23	20
6	48	55	270	316	480	220	59	175	28	27	24	18
7	49	56	269	355	474	218	52	175	28	27	24	18
8	48	51	266	609	475	207	46	174	28	27	22	18
9	46	52	243	661	481	205	57	144	28	27	20	17
10	49	59	275	718	486	200	57	113	28	27	20	17
11	49	63	300	801	497	201	57	98	60	27	18	17
12	55	64	308	903	502	209	56	79	61	20	22	17
13	58	63	234	715	448	218	56	67	60	20	116	17
14	62	69	178	581	416	255	45	76	48	20	92	17
15	61	73	163	469	336	310	44	73	48	20	64	16
16	62	66	153	457	304	370	43	61	36	20	53	16
17	69	69	163	430	315	407	42	61	36	27	48	20
18	66	69	186	400	385	440	41	53	27	27	39	20
19	64	66	248	420	410	431	40	53	47	20	36	19
20	64	68	342	496	480	363	40	52	37	20	32	20
21	64	69	372	564	509	303	41	42	36	20	28	19
22	63	72	396	576	527	290	42	41	35	20	26	26
23	63	74	396	516	527	239	71	31	35	27	24	27
24	63	87	351	455	474	176	352	31	35	45	22	27
25	61	106	346	370	450	154	276	31	27	27	21	29
26	62	174	337	340	438	138	235	50	35	27	26	31
27	90	296	302	455	402	108	211	50	27	20	30	29
28	109	322	291	520	382	91	222	49	35	20	36	29
29	96	335	283	526	357	101	222	49	35	27	33	29
30	68	330	215	520	196	221	60	35	27	27	27	23
31	63	107	107	518	216	216	49	35	27	27	27	23

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	109	46	61.6	3,790
November	335	51	103	6,130
December	396	107	271	16,700
January	903	97	464	28,500
February	527	304	450	25,900
March	440	91	248	15,200
April	352	40	106	6,310
May	209	31	92.8	5,710
June	61	27	37.1	2,210
July	45	20	25.6	1,570
August	116	18	34.4	2,120
September	31	16	21.4	1,270
The year	903	16	159	115,000



## 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 1932.

EXTREMES.—Maximum discharge during year not determined; no flow Aug. 10, Sept. 14, 15.

REMARKS.—Records fair. Discharge estimated Nov. 1 to May 27. Gage read on alternate days July 18 to Sept. 30. Numerous diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	5	25							16	28	16	17
2.....	6	23					100		50	24	10	17
3.....	9		320	130	500	280		210	18	25	5	17
4.....	8	25					106		16	22	3	16
5.....	8						100		14	19	2	15
6.....	7			200		200			13	18	2	14
7.....	8			300		145		180	14	15	2	10
8.....	8	24	260	344	480		50		13	15	3	5
9.....	8			480		150		183	12	13	2	5
10.....	8			480				165	10	5	1	5
11.....	8						49	147	22	5	0	3
12.....	12								60	5	18	2
13.....	11	26	240	720	440	240	50	130	29	5	37	1
14.....	13								25	5	58	0
15.....	14								24	5	80	0
16.....	14					400			22	5	60	2
17.....	15					400	40		48	5	40	3
18.....	13	27	210	450	380	728		80	27	5	32	4
19.....	14					700	38		490	4	24	3
20.....	16					700	40	58	101	3	22	2
21.....	15				500				70	3	20	2
22.....	15			490	824				56	3	14	2
23.....	16	33	370		800	240	150	40	49	4	8	2
24.....	14								43	4	7	3
25.....	16			469				29	41	7	6	4
26.....	16							30	39	11	24	5
27.....	26	120			390			30	37	7	24	5
28.....	18						220	22	37	3	23	4
29.....	33	235	260	470		150		25	37	4	22	4
30.....	26	352						25	32	5	20	3
31.....	26							22		40	18	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	33	5	13.7	842
November.....			54.0	3,210
December.....			276	17,000
January.....			437	26,900
February.....			493	28,400
March.....			272	16,700
April.....			102	6,070
May.....			107	6,580
June.....	490	10	48.8	2,900
July.....	40	3	10.4	640
August.....	80	0	19.5	1,200
September.....	17	0	5.8	345
The year.....		0	152	111,000

## 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 1932. Records 1915 to 1931 published by State engineer.

EXTREMES.—Maximum discharge during year not determined; no flow great part of period May 19 to Sept. 30.

1914-32: Maximum discharge, 22,000 second-feet June 13, 1921; frequently no flow during summer months.

REMARKS.—Records roughly approximate.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4	0	50						23	0	2	2
2	2	0	150						7	0	2	2
3	10	0		240	500	300	300	200	3	14	2	3
4	5	0	350						0	12	0	5
5	5	0							0	8	0	7
6	5	0		66					0	2	0	10
7	5	0		80					0	2	0	6
8	5	0	320		450	180	100	150	0	2	0	10
9	5	0		500					0	4	0	2
10	4	0							0	2	0	2
11	4	0				250	50	120	15	0	0	2
12	8	0				250	51	120	24	0	0	2
13	5	0	250	800	440	400	40	111	35	0	0	2
14	2	0				500	30	100	35	0	0	2
15	0	0				500	20	80	18	0	0	3
16	0	0	200			700	5	60	11	0	0	3
17	0	0	100		250	851	5	40	21	0	0	3
18	0	5	82	600		800		22	27	0	0	2
19	0	10	80			800	200	20	146	0	0	2
20	0	20	80		232	500		20	80	0	0	2
21	0	25		500	250		200	20	111	0	0	2
22	0	15		500				20	63	0	0	2
23	0	10	150	474		250		10	39	2	0	3
24	0	5		400	400		400	10	27	2	0	3
25	0	0		400				5	26	2	0	3
26	0	0						5	26	2	0	3
27	0	0			600			0	26	2	0	3
28	0	0	250	400		180	400	4	15	0	0	3
29	0	0						8	5	2	0	3
30	0	0						23	2	2	2	3
31	0							39		8	2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	10	0	2.2	135
November	25	0	3.0	179
December			222	13,600
January			468	28,800
February			429	24,700
March			332	20,400
April			220	13,100
May	200	0	83.5	5,130
June	146	0	26.2	1,560
July	14	0	2.3	141
August	2	0	0.3	13
September	10	2	3.3	196
The year		0	149	108,000

NOTE.—No flow during August and September 1931 except Sept. 14, 2 second-feet; Sept. 15, 5 second-feet; Sept. 16, 5 second-feet.

## 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 1932.

EXTREMES.—Maximum discharge during year, 518 second-feet May 23 (gage height, 3.35 feet); minimum occurred during winter.

1909-10, 1913-32: Maximum discharge, 1,910 second-feet June 8, 1921 (gage height, 5.9 feet); minimum, 12 second-feet Dec. 18, 1922 (gage height, 1.5 feet).

REMARKS.—Records good except those for Nov. 21 to Apr. 7, which were based on four discharge measurements and temperature records. Minor diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	62						70	265	301	206	94
2	51	59			• 49			80	270	288	186	89
3	57	60				• 32	45	104	288	280	162	83
4	59	48	• 50					102	301	265	158	82
5	56	49		• 30				98	293	259	147	76
6	52	51					55	102	276	240	134	76
7	51	51					55	106	284	229	131	75
8	60	49					56	100	307	216	127	62
9	59	56					51	100	335	213	123	60
10	72	54					43	114	324	231	118	63
11	70	48					42	120	318	282	114	67
12	70	39					49	142	324	321	125	65
13	65	26					54	170	321	354	120	64
14	59	29					62	186	329	296	110	60
15	56	32					68	229	346	248	112	59
16	48	35					75	231	374	240	114	59
17	45	25					85	240	354	287	114	56
18	46	35					82	259	332	276	123	56
19	45	48					70	310	324	262	110	60
20	49	31					68	276	321	251	110	59
21	60						80	301	310	226	120	60
22	57						85	401	307	206	138	70
23	51	35					98	443	321	206	118	52
24	56						70	357	304	203	106	60
25	54						57	346	304	198	98	96
26	48						92	307	329	179	112	89
27	48						76	268	349	179	110	76
28	39	50					73	273	329	177	110	73
29	40						68	282	315	179	118	78
30	29						68	290	301	268	102	75
31	35							268		282	96	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	72	29	52.9	3,250
November	62	25	43.7	2,600
December			48	2,950
January			32	1,970
February			45	2,590
March			45	2,770
April	98	42	63.6	3,780
May	443	70	215	13,200
June	374	265	316	18,800
July	354	177	247	15,200
August	206	96	125	7,690
September	96	52	70.0	4,170
The year	443		109	79,000

• Result of discharge measurement.

## 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 1932. Comparable record at site 3 miles upstream from September 1917 to December 1926.

EXTREMES.—Maximum discharge during year, 760 second-feet June 28 (gage height, 3.72 feet); minimum, 1.4 second-feet (seepage when power plant is shut down and water is being stored).

1929-32: Maximum discharge, 868 second-feet Aug. 14, 1930 (gage height, 4.19 feet); minimum, 1.4 second-feet at various times.

Maximum discharge known, 8,000 second-feet July 31, 1919.

REMARKS.—Records excellent. Small storage reservoir above power plant, capacity, about 30 acre-feet. Gage-height record furnished by city of Loveland.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	48	26	16	10	30	28	54	370	560	298	95
2	63	43	24	18	7	22	34	60	370	515	236	84
3	64	42	22	14	11	22	35	75	335	515	203	79
4	62	43	21	18	10	20	31	84	335	515	182	75
5	59	41	22	14	15	18	36	95	365	475	172	70
6	58	40	20	12	12	17	36	95	400	382	162	67
7	67	39	21	12	14	18	23	110	435	365	152	64
8	73	35	20	16	15	18	30	118	475	365	143	62
9	71	38	22	13	16	23	30	110	475	365	134	60
10	67	34	23	15	17	25	22	118	475	350	134	58
11	71	32	22	16	16	24	26	152	475	382	126	57
12	70	37	23	16	15	26	28	192	400	400	126	53
13	63	30	21	16	18	16	32	236	435	475	126	50
14	59	27	19	17	16	18	42	310	475	418	126	48
15	55	31	19	17	18	18	49	350	570	365	126	48
16	53	28	14	17	18	19	57	310	635	350	126	45
17	52	25	13	15	18	18	58	285	575	365	143	45
18	49	19	17	13	18	18	60	335	475	335	134	42
19	49	31	17	16	18	21	53	418	435	322	172	42
20	48	18	15	16	19	28	56	435	475	310	162	40
21	48	18	22	11	18	22	67	495	495	285	172	38
22	53	15	27	16	20	18	83	538	590	260	182	38
23	49	18	24	13	20	18	95	585	640	248	162	41
24	48	25	22	18	21	18	73	455	635	225	143	45
25	46	32	22	12	22	21	80	418	635	248	126	57
26	47	32	25	11	23	20	84	335	635	225	118	56
27	38	34	20	11	28	15	60	298	690	214	126	50
28	35	30	23	12	29	21	58	272	770	203	126	48
29	38	25	21	10	33	24	62	272	690	272	110	48
30	40	28	20	9	-----	20	57	335	690	298	102	45
31	44	-----	18	13	-----	24	-----	335	-----	310	102	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	73	35	55.0	3,380
November	48	15	31.3	1,880
December	27	13	20.8	1,280
January	18	9	14.3	879
February	33	7	17.8	1,020
March	30	15	20.6	1,270
April	95	22	49.5	2,950
May	585	54	267	16,400
June	710	310	501	29,800
July	560	203	352	21,600
August	298	102	150	9,220
September	95	38	55.0	3,270
The year	710	7	128	92,900

## LODGEPOLE CREEK AT BUSHNELL, NEBR.

LOCATION.—Staff gage in sec. 33, T. 15 N., R. 57 W.,  $1\frac{1}{2}$  miles east of Bushnell. Prior to June 8, 1932, station located in sec. 31, T. 15 N., R. 57 W., at Bushnell; records comparable.

DRAINAGE AREA.—1,090 square miles.

RECORDS AVAILABLE.—March 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 151 second-feet June 27 (gage height, 3.33 feet); minimum, 9 second-feet Aug. 11, 20-23.

1931-32: Maximum discharge, that of June 27, 1932; minimum, 5 second-feet several days during July 1931 (gage height, 0.68 foot, old location).

REMARKS.—Records fair. Discharge estimated November to February. Small diversions upstream.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	23	21	18	16	14	11	11
2	10	25	21	19	15	14	10	11
3	11	24	21	19	16	13	10	11
4	11	22	21	19	15	13	10	11
5	11	20	21	19	15	12	10	11
6	12	27	21	19	15	12	10	11
7	12	23	21	19	13	12	10	11
8	13	27	21	19	12	11	10	11
9	13	25	22	19	12	11	10	11
10	12	22	22	19	45	11	10	11
11	12	22	21	19	18	11	9	11
12	12	22	21	19	16	11	11	11
13	12	24	20	19	15	12	10	11
14	12	23	20	19	13	11	10	11
15	12	24	20	19	13	11	10	11
16	12	25	20	19	12	12	10	11
17	12	25	20	19	11	13	10	11
18	12	24	20	19	12	13	10	11
19	12	25	20	17	12	11	10	11
20	12	23	20	17	12	11	9	11
21	12	23	21	17	12	11	9	11
22	12	22	20	16	11	10	9	11
23	12	21	21	15	11	11	9	11
24	11	21	21	15	11	11	10	11
25	11	21	21	15	11	12	10	12
26	11	21	20	15	10	11	10	12
27	13	21	19	15	69	11	11	12
28	13	21	20	16	30	11	11	12
29	13	18	21	18	20	11	11	12
30	13	23	20	16	16	12	11	12
31	14	21		16		12	10	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	14	9	11.9	732
November			16	952
December			15	922
January			14	861
February			18	1,040
March	27	18	22.8	1,400
April	22	19	20.6	1,230
May	19	15	17.7	1,090
June	69	10	17.0	1,010
July	14	10	11.7	719
August	11	9	10.0	615
September	12	11	11.2	666
The year	69	9	15.5	11,200

## LODGEPOLE CREEK AT SIDNEY, NEBR.

LOCATION.—Staff gage in SE¼SE¼ sec. 31, T. 14 N., R. 49 W., half a mile south of Sidney.

DRAINAGE AREA.—2,190 square miles.

RECORDS AVAILABLE.—March 1931 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 17 second-feet Apr. 23 (gage height, 2.00 feet); no flow June 19.

1931-32: Maximum and minimum discharge, those of 1932.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Feb. 28, Mar. 4-12. Small diversions upstream.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Mar.	Apr.	May	June	Day	Oct.	Mar.	Apr.	May	June
1	0.6	0.4	0.8	2	0.7	16	0.7	1	1	0.6	0.7
2	.7	.5	.7	2	.6	17	.7	.9	1	.7	.7
3	1	.5	1	1	.6	18	1	.4	1	.6	.8
4	.7	.3	1	1	.5	19	.7	.6	1	.6	0
5	.7	.2	1	.9	.5	20	.7	.4	2	.4	.5
6	.6	.2	1	1	.6	21	.7	.5	1	.4	.4
7	.6	.2	2	1	.5	22	1	.5	1	.4	.6
8	.6	.2	2	1	.5	23	1	.5	17	.6	.6
9	.6	.2	2	1	.7	24	1	.3	11	.5	.6
10	.6	.2	2	1	.9	25	1	.5	11	.5	.6
11	.6	.3	1	1	.1	26	2	.4	7	.7	.6
12	.6	.4	1	.9	1	27	.9	.6	3	.6	.6
13	1	.5	1	.9	.8	28	2	.6	3	1	.6
14	1	.3	1	.6	.7	29	.7	.6	3	.6	.6
15	1	1	1	.7	.7	30	1	.6	2	.6	.5
						31	1	.7		.6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2	0.6	0.87	53
November			.5	30
December			.5	31
January			.6	37
February			.7	40
March	1	.2	.47	29
April	17	.7	2.78	165
May	2	.4	.82	50
June	1	0	.59	35
The period				470

## 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 1932.

EXTREMES.—Maximum discharge during year, 18,000 second-feet Mar. 17 (gage height, 5.19 feet); minimum, 550 second-feet (estimated) Mar. 10.

1895-97, 1899, 1903, 1928-32: Maximum discharge, that of Mar. 17, 1932; minimum, 230 second-feet Nov. 23, 1929 (gage height, 0.30 foot).

REMARKS.—Records fair. Discharge estimated Oct. 16-22, Nov. 23 to Dec. 10, Jan. 5 to Feb. 26, Mar. 4-16. No diversions or regulation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	
1.....	1,020	930	1,150	2,500	900	1,920	1,100	1,120	7,830	1,450	3,070	870	
2.....	1,080	900	1,180	1,580		1,450	1,080	885	10,300	1,780	2,070	915	
3.....	1,030	1,070	1,100	825		1,240	1,180	930	5,550	1,860	1,270	810	
4.....	1,050	1,050	1,050	1,150		1,000	1,240	1,020	1,940	2,250	2,870	754	
5.....	1,120	1,050	916	850		850	1,130	981	1,980	855	2,570	780	
6.....	1,100	915	1,200	868	950	800	1,030	998	1,900	855	2,500	767	
7.....	1,120	981		810		750	1,070	1,120	1,980	900	1,970	825	
8.....	1,270	1,020				650	885	840	9,430	810	1,070	855	
9.....	1,360	885				600	780	998	11,400	810	1,180	900	
10.....	1,320	1,170				550	981	1,020	2,250	1,310	1,370	1,050	
11.....	1,380	1,220	1,540	810	1,000	650	855	998	1,380	998	1,470	1,200	
12.....	1,610	1,180	1,500		1,040	750	754	947	2,450	810	1,500	1,220	
13.....	1,560	1,170	1,500		1,050	850	915	947	3,080	702	1,220	1,170	
14.....	1,470	1,170	1,470			1,000	947	855	2,170	702	1,070	981	
15.....	1,450	1,020	1,400			1,400	1,050	1,030	1,670	715	1,220	981	
16.....	1,300	1,030	1,580	780	1,250	2,800	1,100	1,120	1,180	715	1,070	1,020	
17.....	1,250	1,120	1,760			8,620	1,170	1,050	1,650	741	1,070	981	
18.....	1,200	1,100	1,800			2,930	1,130	825	2,450	825	1,070	1,030	
19.....	1,200	1,130	1,760			1,780	1,030	810	3,080	780	970	810	
20.....	1,210	1,290	1,760	820		1,380	1,030	702	2,570	741	1,400	1,120	
21.....	1,200	1,310	1,760	870	1,500	1,560	1,150	870	1,740	767	970	1,120	
22.....	1,200	840	1,650			1,780	1,130	767	1,320	2,170	670	1,080	
23.....	1,220	750	1,720			1,800	1,410	900	1,100	1,760	702	1,200	
24.....	1,150		1,760			1,270	1,540	1,030	1,170	1,580	676	1,030	
25.....	1,020		2,040			1,240	1,690	1,290	1,130	1,030	670	930	
26.....	728	720	2,000	950	1,400	1,310	1,320	1,610	1,150	930	676	1,130	
27.....	780	742	1,800		6,120	1,290	1,170	1,470	1,490	1,080	970	1,310	
28.....	1,200	1,100	1,900		3,650	1,340	1,080	1,520	1,410	1,410	1,050	1,240	
29.....	900		2,210		2,470	1,380	1,180	1,310	1,650	981	977	1,270	
30.....	795		2,520	1,100	1,450	1,130	1,290	1,630	900	900	975	1,050	
31.....	780		2,500	1,000	1,320	1,320	14,200	-----	-----	6,550	975	-----	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,610	728	1,160	71,300
November.....	1,310	-----	1,020	60,700
December.....	2,520	916	1,590	97,800
January.....	2,500	-----	944	58,000
February.....	6,120	-----	1,440	82,800
March.....	8,620	550	1,540	94,700
April.....	1,840	754	1,110	66,000
May.....	14,200	702	1,470	90,400
June.....	11,400	1,100	3,000	179,000
July.....	6,550	702	1,280	78,700
August.....	3,080	676	1,320	81,200
September.....	1,310	754	1,010	60,100
The year.....	14,200	550	1,410	1,020,000

## LOUP RIVER NEAR GENOA, NEBR.

LOCATION.—Chain gage in sec. 25, T. 17 N., R. 4 W., 2 miles south of Genoa.  
Zero of gage is 1,542.0 feet above mean sea level.

DRAINAGE AREA.—13,400 square miles.

RECORDS AVAILABLE.—August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 29,200 second-feet May 31 (gage height, 4.60 feet); minimum, 490 second-feet (estimated) Mar. 10.

1928-32: Maximum discharge, that of May 31, 1932; minimum, that of Mar. 10, 1932.

REMARKS.—Records fair. Discharge estimated Jan. 7 to Feb. 26, Mar. 5-15.  
No diversions or regulation.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	1,710	1,650	2,660	2,680	1,320	5,980	2,450	1,850	17,400
2.....	1,790	1,750	2,370	2,840		3,940	2,150	1,960	17,300
3.....	1,710	2,000	2,300	2,970		3,030	2,100	1,930	11,000
4.....	1,710	2,100	2,280	2,840		2,680	2,180	1,920	3,520
5.....	1,700	2,060	2,610	2,470	1,600	2,450	2,240	1,900	3,660
6.....	1,750	1,970	2,660	1,780		2,600	2,180	1,740	3,490
7.....	1,790	1,930	2,760	1,600		1,800	2,320	1,760	2,610
8.....	1,790	1,870	2,860	1,400		1,300	2,300	1,780	4,310
9.....	1,760	1,880	3,250			920	2,040	1,860	23,500
10.....	1,780	1,870	3,420			490	1,900	1,870	8,020
11.....	1,740	1,990	2,780	1,300	1,800	840	2,210	1,900	4,010
12.....	1,790	1,840	2,840	1,450		1,200	2,260	1,870	4,160
13.....	2,280	2,060	2,890	1,400		1,600	2,230	1,830	4,200
14.....	2,370	2,120	2,780			2,000	2,210	1,820	3,900
15.....	2,340	2,180	2,320			2,400	2,130	1,900	4,090
16.....	2,280	2,160	2,020	1,200	1,850	6,800	2,230	1,790	7,700
17.....	2,260	2,410	2,130			12,300	2,230	1,820	5,740
18.....	2,230	2,020	2,130			5,630	2,390	1,810	3,940
19.....	2,160	1,950	2,520	838	1,910	3,190	2,590	1,640	6,500
20.....	2,030	1,930	3,350	1,000	2,100	2,470	2,540	1,690	6,100
21.....	1,950	1,860	3,940	1,300	2,750	2,020	2,520	1,640	3,940
22.....	1,990	1,580	4,400			2,280	2,760	1,640	3,460
23.....	1,990	1,480	3,800			2,520	2,680	1,650	3,080
24.....	2,040	1,300	3,730			2,260	3,030	2,000	2,540
25.....	2,070	1,080	4,090	1,350	5,500	2,130	3,900	2,360	2,560
26.....	2,030	1,080	3,700			2,370	2,710	4,160	3,700
27.....	1,890	1,490	3,760			20,500	2,540	3,280	3,030
28.....	2,000	1,750	3,420			19,700	2,890	2,300	2,630
29.....	2,100	1,920	3,560	1,350	8,100	2,780	2,180	2,970	2,500
30.....	1,950	2,390	2,940			2,780	2,030	2,730	2,780
31.....	1,800		2,890			3,100		26,400	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2,370	1,700	1,960	121,000
November.....	2,410	1,080	1,860	111,000
December.....	4,400	2,020	3,010	185,000
January.....	2,970		1,560	95,900
February.....	20,500		3,470	200,000
March.....	12,300	490	2,940	181,000
April.....	3,900	1,900	2,390	142,000
May.....	26,400	1,640	2,840	175,000
June.....	23,500	2,500	5,870	349,000
The period.....				1,560,000



## DISMAL RIVER AT DUNNING, NEBR.

LOCATION.—Staff gage in sec. 4, T. 21 N., R. 24 W., at Dunning.

DRAINAGE AREA.—1,290 square miles.

RECORDS AVAILABLE.—October 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 741 second-feet June 11 (gage height, 5.84 feet); minimum occurred during winter.

REMARKS.—Records good except those for periods Oct. 1 to Feb. 29 and July 1 to Sept. 30, for which no monthly means were estimated. No regulation or diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.					500	352	352	311			
2.						352	346	313			
3.						343	352	313			
4.						357	350	326			
5.		* 330				352	374	336			
6.					250	341	353	328			
7.	* 372					323	336	333			
8.			* 363			338	320	341			
9.						336	323	336			
10.						360	330	333			
11.				* 429	325	343	323	569			
12.						346	326	336			
13.						346	333	318	* 317		
14.						354	357	313			
15.						341	352	313			* 330
16.					407	336	343	380		* 359	
17.					330	341	333	395			
18.		* 363			352	368	330	323			
19.					346	398	320	354			
20.					346	389	316	320			
21.					368	352	326	304			
22.					349	354	313	316			
23.					365	371	308	320			
24.	* 319				357	407	302	338			
25.					360	374	336	328			
26.					357	346	326	341			
27.					362	338	297	328			
28.					352	395	288	318			
29.					368	386	304	313			
30.					365	374	304	320			
31.					365		343				
Month					Maximum	Minimum	Mean	Run-off in acre-feet			
March							359	22,100			
April					407	323	357	21,200			
May					383	283	331	20,400			
June					569	304	337	20,100			
The period								83,800			

\* 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 1932.

EXTREMES.—Maximum discharge during year, 12,600 second-feet May 31 (gage height, 5.60 feet); minimum, 180 second-feet (estimated) Mar. 10.

1895-97, 1899, 1903, 1928-32: Maximum discharge (estimated), 90,000 second-feet June 6, 1896; minimum, 126 second-feet Jan. 15, 1931.

REMARKS.—Records fair. Discharge estimated Nov. 26 to Dec. 6, Jan. 4 to Feb. 26, Mar. 4, 5, 8-16. No diversions.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	782	771	980	716	625	1,150	989	951	2,000	725	879	674
2	802	750	938	636		1,070	927	855	9,500	716	855	628
3	782	771	950	613		1,070	951	813	1,960	1,240	771	636
4	802	733	850	651		780	975	792	1,210	1,100	975	643
5	782	813	1,010	600		350	891	771	951	963	1,060	636
6	802	867	1,200	650	775	255	867	915	879	927	792	628
7	824	855	1,290			285	927	1,020	1,030	891	782	620
8	844	834	1,360			200	855	975	8,510	867	683	590
9	813	879	1,390			190	813	855	5,090	1,440	1,030	613
10	802	951	1,220			180	834	750	1,690	708	700	802
11	813	939	1,370	700	950	250	927	733	1,100	651	651	834
12	844	1,030	1,290			500	915	716	1,550	651	760	908
13	903	975	1,210			800	903	716	1,300	651	700	834
14	1,000	1,030	963			1,100	879	683	1,210	620	725	813
15	951	915	867			1,050	879	683	1,200	590	733	792
16	951	903	1,100	725	1,200	1,750	891	733	1,100	584	700	750
17	855	927	1,180			2,840	903	683	1,800	605	760	725
18	813	879	1,360			1,660	975	658	1,400	620	725	708
19	834	975	1,480			1,250	1,060	613	1,700	643	636	691
20	834	1,210	1,720			1,040	1,000	643	2,000	651	834	708
21	834	1,060	1,550	750	1,250	1,180	975	636	1,500	636	708	760
22	834	1,090	1,550			951	1,020	666	1,770	1,510	636	760
23	844	834	1,660			903	1,090	643	1,430	733	598	750
24	813	700	1,410			1,060	1,360	708	1,300	683	605	760
25	844	636	1,390			1,060	1,320	824	1,900	700	666	760
26	834	680	1,290	650	471	1,800	1,000	1,270	2,040	900	691	683
27	771	694	1,070			7,840	1,180	1,000	1,240	879	700	834
28	855	760	915			5,000	1,090	903	1,220	805	683	802
29	855	980	834			2,300	1,060	927	1,210	800	771	813
30	834	980	989			1,090	951	1,160	834	716	700	824
31	792	-----	1,150	490	-----	1,060	-----	8,860	-----	951	700	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,000	771	837	51,500
November	1,210	636	881	52,400
December	1,720	834	1,210	74,400
January	-----	471	678	41,700
February	7,840	-----	1,420	81,700
March	2,840	180	956	58,800
April	1,360	813	973	57,900
May	8,860	613	1,120	68,900
June	9,500	834	2,000	119,000
July	1,510	584	792	48,700
August	1,060	598	757	46,500
September	903	590	738	43,900
The year	9,500	180	1,030	745,000

## CALAMUS RIVER NEAR HARROP, NEBR.

LOCATION.—Staff gage in sec. 24, T. 23 N., R. 18 W., 6 miles southeast of Harrop.

DRAINAGE AREA.—983 square miles.

RECORDS AVAILABLE.—October 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 340 second-feet June 19 (gage height, 2.48 feet); minimum occurred during winter.

REMARKS.—Records good except those for Oct. 1 to Feb. 29, July 1 to Sept. 30, for which no monthly means were estimated.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						240	228	268	201		
2						228	222	268	348		
3					300	222	225	256			
4						222	228	233			
5		* 204				217	225	233			
6						212	252	220			
7						214	276	209			
8	* 206				260	207	240	292			
9			* 198			209	222	264			
10				* 246		214	228	256			
11						212	225	276			
12						214	217	284			
13					280	212	214	272	* 209		
14						214	207	240			* 196
15					292	220	206	240		* 191	
16					324	214	203	264			
17					260	209	206	284			
18					268	217	204	300			
19		* 221			264	220	201	322			
20					260	225	201	316			
21					217	231	199	300			
22					240	240	198	284			
23					240	252	196	252			
24					248	268	196	231			
25					244	260	220	212			
26	* 203				248	268	228	214			
27					236	256	225	209			
28					233	240	231	206			
29					248	236	228	206			
30					225	228	228	203			
31					240		268				
Month					Maximum	Minimum	Mean	Run-off in acre-feet			
March					324	217	265	16,300			
April					268	207	227	13,500			
May					276	196	221	13,600			
June					322	203	254	15,100			
The period								58,500			

\* Result of discharge measurement.

## CEDAR RIVER NEAR FULLERTON, NEBR.

LOCATION.—Staff gage in sec. 32, T. 17 N., R. 6 W., 4 miles northwest of Fullerton.  
DRAINAGE AREA.—1,130 square miles.

RECORDS AVAILABLE.—September 1931 to September 1932.

EXTREMES.—Maximum discharge during period of records, 1,440 second-feet June 9 (gage height, 7.05 feet); minimum occurred during winter.

REMARKS.—Records good except those for Nov. 23 to Mar. 19, which were based on two discharge measurements and temperature records, and July 1 to Sept. 30, 1932, for which no monthly means were estimated.

## Discharge, in second-feet, 1931-32

Day	Sept.	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1		170	179				228	198	299
2		170	188				228	196	391
3		171	188			400	216	191	333
4		168	188				220	191	278
5		178	181				217	183	228
6		176	191		* 176		217	171	242
7		179	195			250	217	191	224
8		176	188				217	196	468
9		179	196				218	181	987
10		183	196			183	213	178	673
11		186	201				212	178	315
12		195	205				210	210	262
13		212	201			220	219	178	249
14	106	217	201	* 142			212	162	272
15	144	208	198				210	160	190
16	141	201	200				212	164	613
17	140	195	208			550	208	170	929
18	147	203	196				203	170	811
19	165	196	203				220	176	224
20	164	184	217			239	228	167	249
21	153	181	238			231	219	173	212
22	168	190	184			231	215	171	195
23	153	164				247	226	168	183
24	162	178	180			237	228	175	175
25	193	171				237	257	186	168
26	168	171				235	253	309	597
27	170	168				235	242	267	360
28	158	167	190			237	205	212	205
29	164	175				243	200	208	171
30	164	173				245	198	193	168
31		181				235		489	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
September 14-30	193	106	156	5,260
October	217	164	183	11,300
November	238	179	194	11,600
December			240	14,800
January			155	9,530
February			210	12,100
March			301	18,500
April	257	198	219	13,000
May	489	160	198	12,200
June	937	168	337	20,100
The period				128,000

\* Result of discharge measurement.

## ELKHORN RIVER AT O'NEILL, NEBR.

LOCATION.—Staff gage in sec. 31, T. 29 N., R. 11 W., at O'Neill.

DRAINAGE AREA.—651 square miles.

RECORDS AVAILABLE.—March 1931 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 319 second-feet June 1 (gage height, 3.08 feet); minimum, 8 second-feet Mar. 8-12 (gage height, 1.10 feet).

1931-32: Maximum discharge, that of June 1, 1932; minimum, that of Mar. 8-12, 1932.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Mar. 15. No diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	* 30			134	87	61	86			
2	23				116	80	61	73			
3	23				102	73	50	69			
4	23				90	73	50	60			
5	23				75	67	56	59			
6	23				40	67	61	51			
7	26	* 31			20	61	61	47			
8	26				10	61	61	59			
9	26		* 35	* 28	8	56	67	116			
10	26				8	61	94	140			
11	23				8	73	87	148			
12	30				8	67	87	191			
13	39				15	61	73	253			* 29
14	39				25	61	67	229	* 34		
15	39				38	56	61	191		* 50	
16	30				128	50	61	253			
17	30				148	50	61	288			
18	23				110	50	50	258			
19	23	* 32			102	50	50	217			
20	23				87	50	44	211			
21	30				87	50	39	182			
22	30				87	50	39	169			
23	30				94	50	39	128			
24	30				102	61	32	110			
25	30				102	67	34	90			
26	30				110	61	63	84			
27	30				102	67	71	77			
28	30				102	67	66	72			
29	30				94	67	68	59			
30	30				87	61	63	60			
31	30				94		68				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	39	23	28.1	1,730
November			40	2,380
December			40	2,460
January			35	2,150
February			45	2,500
March	148	8	75.3	4,630
April	87	50	61.8	3,680
May	94	32	59.5	3,660
June	288	47	134	7,970
The period				31,200

\*Result of discharge measurement.

## ELKHORN RIVER AT NELIGH, NEBR.

LOCATION.—Staff gage in sec. 20, T. 25 N., R. 6 W., at Neligh.

DRAINAGE AREA.—1,740 square miles.

RECORDS AVAILABLE.—March 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 670 second-feet June 11 (gage height, 3.64 feet); minimum, 12 second-feet July 2 (gage height, 1.26 feet).

1931-32: Maximum discharge, that of June 11, 1932; minimum, that of July 2, 1932.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Feb. 29, Mar. 8-17: No diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80				338	302	243	298	12	184	95
2	80				298	310	236	390	138	145	88
3	80				262	302	229	468	354	208	87
4	80				222	314	218	464	382	278	91
5	80				187	306	208	362	354	334	93
6	80				162	306	226	274	302	370	88
7	80				145	286	258	298	226	496	86
8	94			• 134	110	274	262	273	180	410	83
9	94	• 126			60	243	243	491	135	318	87
10	108				70	222	232	496	116	243	94
11	108		• 144		70	222	229	675	101	215	91
12	108				120	236	243	580	87	240	101
13	138				179	243	243	595	83	201	101
14	150				200	232	236	575	90	148	98
15	125				250	229	198	496	101	140	97
16	125				300	226	198	460	113	138	93
17	116				350	218	187	570	118	125	93
18	108				424	222	177	550	122	115	90
19	101	• 133			428	236	162	545	125	101	87
20	94				424	270	148	468	113	90	87
21	94				362	262	138	198	101	101	90
22	101				330	240	120	69	88	98	90
23	101				286	250	122	64	83	93	93
24	101				322	278	118	55	83	87	90
25	94				402	298	162	40	80	86	93
26	94				402	318	258	31	81	88	94
27	94				402	306	232	24	80	93	122
28	108				382	290	208	20	73	98	118
29	111				342	274	226	16	70	95	115
30	115				322	258	226	14	81	90	113
31	115				310		266		138	97	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	150	80	102	6,270
November			160	9,520
December			160	9,840
January			135	8,300
February			180	10,400
March	428	60	273	16,800
April	318	218	266	15,800
May	266	118	208	12,800
June	665	14	322	19,200
July	382	12	136	8,360
August	496	86	178	10,900
September	122	83	94.9	5,650
The year	665	12	184	134,000

• Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 10,900 second-feet May 7 (gage height, 7.19 feet); minimum, 209 second-feet July 28 (gage height, 1.30 feet). 1911-13; 1928-32: 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 Jan. 6 to Mar. 15, which were based on two discharge measurements and temperature records. No diversions.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	322	343	520	1,240	610	7,470	1,110	852	1,490	788	247	498
2.....	277	330	520	1,100		5,400	1,130	828	1,890	597	262	465
3.....	274	351	531	1,090		4,330	1,130	820	1,870	526	420	455
4.....	274	351	543	896		3,960	1,130	820	2,470	514	1,120	450
5.....	264	351	537	914		3,690	1,110	1,050	1,770	1,220	543	410
6.....	339	347	487	800	675	1,080	3,050	1,680	1,190	455	387	
7.....	396	351	482			1,060	10,600	1,750	812	482	392	
8.....	392	351	537			1,000	5,850	1,480	1,290	1,000	378	
9.....	677	369	591			959	3,390	1,810	914	869	373	
10.....	896	373	616			914	2,060	5,520	622	887	415	
11.....	503	382	780	700	680	887	1,680	3,210	543	1,150	476	
12.....	396	492	941			860	1,430	6,060	450	3,450	537	
13.....	410	425	728			828	1,350	3,650	420	6,700	604	
14.....	401	435	560			788	1,260	3,760	364	3,100	941	
15.....	378	460	610	631		780	1,180	2,040	326	3,670	860	
16.....	364	487	498	625	670	3,500	844	1,120	1,770	311	2,500	656
17.....	369	471	531			6,500	836	1,030	2,020	307	1,740	597
18.....	369	450	564			3,120	812	968	1,870	292	1,300	503
19.....	364	455	597			2,020	772	896	1,660	288	1,100	465
20.....	373	503	629			1,800	896	828	1,340	274	950	430
21.....	351	597	684	630	700	1,720	959	788	1,200	274	820	735
22.....	335	742	780			1,660	1,220	758	1,180	267	728	1,100
23.....	330	1,570	1,050			1,600	1,230	698	1,180	295	649	1,090
24.....	339	2,000	1,030			1,630	1,130	698	1,100	247	555	1,250
25.....	326	1,260	986			1,650	1,450	705	1,870	229	537	691
26.....	330	812	878	600	1,350	1,740	1,430	844	1,660	235	514	610
27.....	330	622	820			2,000	1,650	1,080	2,700	217	560	555
28.....	330	656	758			3,100	1,370	968	1,970	2,400	214	560
29.....	343	610	735			5,820	1,250	923	1,560	1,720	232	543
30.....	339	560	735			1,220	887	1,550	1,140	217	537	549
31.....	343	-----	1,080	-----	-----	1,190	-----	1,560	-----	223	566	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	896	264	379	23,300
November.....	2,000	330	584	34,800
December.....	1,080	482	688	42,300
January.....	1,240	-----	727	44,700
February.....	5,820	-----	998	57,400
March.....	7,470	1,190	2,500	154,000
April.....	1,450	772	1,010	60,100
May.....	10,600	698	1,770	109,000
June.....	6,060	1,100	2,170	129,000
July.....	1,290	214	474	29,100
August.....	6,780	247	1,250	76,900
September.....	1,250	373	598	35,600
The year.....	10,600	214	1,100	796,000

## 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 1932; March 1922 to September 1930 at site 6 miles downstream.

EXTREMES.—1928-32: Maximum discharge, 12,000 second-feet Mar. 13, 1929 (gage height, 22.10 feet); minimum, 20 second-feet Mar. 6, 1931 (gage height, 1.32 feet).

REMARKS.—Records fair except those for periods of ice effect Dec. 20-28, 1928; Jan. 2 to Mar. 10, Nov. 22-26, Dec. 2-13, 18-31, 1929; Jan. 1, 5-31, Feb. 1-9, 16, Mar. 3, 4, Nov. 26-28, Dec. 2, 3, 17-23, 28-31, 1930; Jan. 1, 12-23, 1931; Jan. 5 to Feb. 9, Mar. 6-17, 1932; which are poor. Discharge estimated Oct. 1-4, 1928; Sept. 5, 1929; Nov. 19, 1930.

*Discharge, in second-feet, 1928-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1-----	280	736	632	580	299	970	1,120	1,590	2,030	1,010	708	306
2-----	270	1,140	556	580	299	940	1,210	1,310	1,740	852	616	275
3-----	260	1,280	736	556	299	910	1,120	1,180	2,440	756	660	260
4-----	260	1,060	1,100	532	282	880	1,120	1,120	1,370	616	638	260
5-----	250	880	1,000	532	282	910	956	1,090	1,150	1,120	508	334
6-----	250	820	1,030	508	282	3,030	4,550	1,060	1,370	6,620	488	408
7-----	250	850	1,100	508	282	4,110	3,520	1,030	2,400	3,660	488	355
8-----	235	792	940	484	282	6,090	1,590	982	2,670	1,820	468	338
9-----	235	684	850	484	282	5,950	1,210	982	1,830	1,150	468	1,010
10-----	220	632	736	508	282	5,820	5,000	956	1,340	930	448	804
11-----	220	606	850	508	299	6,620	3,340	5,650	1,000	5,500	428	488
12-----	220	580	1,240	484	299	9,110	2,350	3,660	970	2,540	428	408
13-----	220	556	1,100	484	299	11,800	2,060	2,180	904	1,450	408	355
14-----	580	580	1,380	460	299	11,500	2,800	1,940	970	1,060	390	322
15-----	374	556	2,140	438	299	8,460	1,980	1,520	970	7,350	355	338
16-----	354	850	2,310	416	299	7,250	1,590	1,340	878	6,460	355	290
17-----	438	1,560	1,660	416	299	6,230	1,340	1,240	770	3,840	338	275
18-----	532	2,020	1,310	394	299	3,160	1,060	1,180	708	1,980	322	245
19-----	1,420	1,520	1,030	374	316	2,900	1,280	1,030	670	1,420	306	306
20-----	1,310	1,310	1,030	374	316	2,140	1,310	1,010	872	1,210	306	508
21-----	580	1,200	1,030	354	316	1,980	2,850	956	616	596	306	448
22-----	438	910	1,030	354	316	1,820	2,670	930	2,310	828	306	355
23-----	394	850	1,060	335	335	1,620	2,060	904	770	804	338	275
24-----	354	792	1,060	335	1,740	1,520	2,440	904	684	852	306	260
25-----	316	710	1,100	335	1,480	1,380	3,120	878	690	1,780	290	245
26-----	282	658	1,100	316	1,060	1,280	2,850	878	616	1,010	372	219
27-----	316	632	1,140	316	1,030	1,210	2,540	804	638	780	306	232
28-----	299	710	1,170	316	1,000	1,120	2,140	780	670	616	290	245
29-----	299	736	1,100	299	-----	1,030	2,180	828	708	572	275	232
30-----	282	684	850	299	-----	1,010	1,780	930	638	2,180	260	232
31-----	282	-----	820	299	-----	1,030	-----	956	-----	930	322	-----



Discharge, in second-feet, of Nishnabotna River above Hamburg, Iowa, 1928-32—Con.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1929-30												
1	229	1,520	688	420	229	440	325	344	307	253	83	272
2	229	1,170	616	420	229	325	325	325	291	244	81	200
3	214	736	550	382	229	420	325	307	291	244	75	123
4	291	572	506	363	244	440	307	275	291	217	73	102
5	259	484	462	344	275	462	307	259	2,490	208	71	90
6	259	440	462	307	344	484	291	307	1,520	208	78	83
7	244	420	440	307	812	462	275	528	760	200	109	83
8	229	401	440	291	2,140	420	275	462	484	183	183	81
9	382	401	440	291	2,580	420	259	462	420	176	153	192
10	363	484	420	291	2,060	382	259	572	363	168	168	123
11	325	440	420	291	1,940	382	291	2,140	363	160	123	123
12	344	712	420	291	1,450	401	291	1,700	344	160	102	96
13	307	688	440	275	1,340	363	291	1,310	344	146	102	90
14	291	760	462	275	942	363	291	786	2,580	138	96	96
15	259	712	484	259	890	363	401	664	2,400	130	90	90
16	244	640	484	259	838	363	344	594	1,200	123	102	81
17	229	616	484	259	786	440	325	572	658	123	317	90
18	229	616	344	244	916	528	344	664	460	109	736	69
19	1,310	572	325	244	1,140	616	325	572	580	102	589	66
20	616	528	325	244	1,280	550	325	550	394	96	484	57
21	420	401	307	244	1,060	484	325	484	350	160	318	59
22	363	401	291	244	970	440	325	484	330	153	192	57
23	325	401	291	229	864	401	363	462	310	217	153	55
24	291	420	291	229	786	382	325	440	272	168	123	55
25	275	440	291	229	664	401	307	401	910	138	109	55
26	275	462	307	229	640	363	325	382	416	123	102	54
27	275	462	325	229	572	344	325	363	272	109	96	176
28	420	506	363	229	528	344	307	344	272	96	102	160
29	484	736	401	229	-----	344	325	344	253	96	317	109
30	1,590	688	440	229	-----	344	401	325	372	96	153	78
31	1,700	-----	440	229	-----	344	-----	325	-----	102	317	-----
1930-31												
1	69	83	83	109	153	96	130	83	460	330	118	2,440
2	61	81	109	109	168	82	130	77	350	1,240	484	2,060
3	66	81	109	123	160	83	138	69	253	910	183	736
4	64	83	116	123	138	90	146	78	234	580	330	394
5	60	81	116	160	153	83	153	102	2,020	330	217	850
6	66	76	116	130	160	20	138	96	4,500	291	160	310
7	81	76	116	116	153	59	123	96	2,220	310	123	200
8	78	83	109	109	146	102	109	109	1,310	253	109	168
9	78	83	109	123	116	146	109	116	556	226	1,200	138
10	71	90	116	123	146	138	109	123	416	208	330	123
11	67	90	116	116	109	153	90	123	350	183	138	116
12	66	90	109	109	138	183	76	130	330	350	123	102
13	66	83	109	96	109	200	71	130	1,590	1,170	109	96
14	73	83	109	71	96	192	72	146	1,740	580	109	109
15	168	90	102	59	116	168	78	123	5,150	347	96	116
16	606	153	78	59	109	146	78	116	1,480	262	96	109
17	272	138	71	59	96	130	77	96	556	226	90	102
18	200	123	71	59	102	123	72	192	416	200	83	102
19	176	200	83	59	123	102	67	153	330	176	792	146
20	123	710	96	59	116	102	192	130	310	168	1,450	291
21	102	330	83	59	109	102	226	116	5,650	350	632	580
22	102	372	96	59	102	96	226	116	6,790	658	291	484
23	102	253	109	83	123	96	183	102	5,650	460	234	910
24	96	168	123	138	109	102	183	109	3,120	217	183	272
25	90	130	123	138	109	90	176	102	1,520	176	1,100	3,800
26	90	123	123	116	96	96	153	83	850	146	684	2,760
27	90	123	116	116	96	116	123	73	632	130	317	1,820
28	90	123	109	138	96	109	109	350	460	109	208	736
29	82	123	109	160	-----	116	109	1,340	394	109	153	416
30	82	123	109	130	-----	116	83	1,520	330	102	138	330
31	77	-----	109	146	-----	123	-----	1,200	-----	96	123	-----

*Discharge, in second-feet, of Nishnabotna River above Hamburg, Iowa, 1928-32—*  
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1-----	277	225	1,800	4,850	1,170	2,820	1,170	1,200	1,270	1,580	910	1,420
2-----	259	225	1,580	3,840	1,240	2,930	1,170	1,140	6,890	1,270	1,240	1,140
3-----	225	225	1,420	2,370	1,340	2,930	1,140	1,070	5,410	2,880	878	974
4-----	242	225	1,420	1,760	1,340	2,470	1,040	1,070	3,200	1,620	767	878
5-----	209	209	1,340	1,760	1,380	2,220	1,040	1,580	2,570	1,540	612	793
6-----	2,880	209	1,200	2,420	1,420	2,120	1,010	2,120	1,830	1,270	1,270	767
7-----	4,780	201	1,100	2,420	1,500	2,080	1,140	7,370	1,370	1,100	1,460	715
8-----	4,040	201	1,010	2,370	1,670	2,030	1,010	5,270	1,500	1,010	741	663
9-----	4,040	209	1,040	2,270	1,850	1,980	942	3,370	1,790	1,420	637	637
10-----	1,340	209	1,140	2,220	2,370	1,940	942	2,320	3,100	1,340	562	612
11-----	1,940	225	2,670	2,220	2,820	1,940	910	1,850	1,830	1,040	562	587
12-----	1,580	2,270	3,420	2,320	2,720	1,980	878	1,670	3,420	878	7,700	1,540
13-----	1,040	2,320	2,370	2,420	2,420	2,030	848	1,500	2,220	793	8,770	1,980
14-----	1,300	1,720	1,580	2,420	2,620	2,080	820	1,380	2,220	767	8,480	1,380
15-----	820	793	1,270	2,320	2,120	2,220	793	1,420	2,270	715	9,080	741
16-----	562	741	1,200	2,270	2,220	2,370	820	1,420	1,420	715	9,410	637
17-----	489	715	1,270	2,320	2,820	2,420	910	1,460	1,420	689	8,670	587
18-----	420	1,760	1,200	2,320	2,930	2,320	848	1,170	2,720	663	6,500	562
19-----	376	1,670	1,200	2,370	3,260	1,900	878	1,100	2,270	665	4,430	537
20-----	355	974	1,240	2,420	3,040	1,720	910	1,040	1,670	637	2,770	689
21-----	334	820	1,270	2,420	2,930	1,460	1,170	974	1,270	3,150	1,940	848
22-----	314	793	1,200	2,370	4,040	1,200	5,760	942	1,100	1,940	1,620	1,300
23-----	295	5,480	1,200	2,320	3,660	1,140	3,840	878	1,070	1,760	1,200	942
24-----	277	8,870	1,140	2,220	3,040	1,850	2,670	1,140	974	974	1,240	689
25-----	277	9,410	1,070	2,170	2,820	1,940	2,320	2,320	7,270	741	1,170	587
26-----	242	9,190	1,010	2,080	4,710	2,120	2,030	1,720	7,540	689	2,270	537
27-----	259	7,620	910	1,900	4,160	1,940	1,670	1,670	5,690	637	1,940	537
28-----	242	4,230	878	1,620	3,600	1,720	1,420	1,200	4,160	612	1,420	513
29-----	225	2,420	878	1,500	3,040	1,500	1,840	1,040	2,120	587	1,200	489
30-----	225	2,120	878	1,270	-----	-----	1,420	1,300	1,630	612	1,040	466
31-----	225	-----	4,100	1,200	-----	1,300	-----	1,500	-----	612	2,120	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1928-29						
October-----	1,420	220	388	0.136	0.16	23,900
November-----	2,020	556	896	.320	.36	53,300
December-----	2,310	556	1,100	.393	.45	67,600
January-----	580	299	425	.152	.18	26,100
February-----	1,740	282	470	.168	.17	26,100
March-----	11,800	880	3,670	1.31	1.51	226,000
April-----	5,000	956	2,190	.782	.87	130,000
May-----	5,650	780	1,350	.482	.56	83,000
June-----	2,670	616	1,180	.421	.47	70,200
July-----	7,350	572	2,020	.721	.83	124,000
August-----	708	260	403	.144	.17	24,800
September-----	1,010	219	354	.126	.14	21,100
The year-----	11,800	219	1,210	.432	5.87	876,000
1929-30						
October-----	1,700	214	428	.153	.18	26,300
November-----	1,520	401	594	.212	.24	35,300
December-----	688	291	418	.145	.17	25,700
January-----	420	229	278	.095	.11	17,100
February-----	2,580	229	955	.341	.36	53,000
March-----	616	325	413	.147	.17	25,400
April-----	401	259	317	.113	.13	18,900
May-----	2,140	259	572	.204	.24	35,200
June-----	2,580	253	675	.241	.27	40,200
July-----	253	96	156	.056	.06	9,590
August-----	736	71	186	.066	.08	11,400
September-----	272	54	102	.036	.04	6,070
The year-----	2,580	54	420	.155	2.05	304,000

*Discharge, in second-feet, of Nishnabotna River above Hamburg, Iowa, 192~32—*  
Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1930-31						
October.....	606	60	113	0.040	0.05	6,950
November.....	710	76	148	.053	.06	8,810
December.....	123	71	105	.038	.04	6,460
January.....	160	59	105	.038	.04	6,460
February.....	168	96	123	.044	.05	6,830
March.....	200	20	115	.041	.05	7,070
April.....	226	67	124	.044	.05	7,380
May.....	1,520	69	239	.085	.10	14,700
June.....	6,790	234	1,670	.596	.66	99,400
July.....	1,240	96	351	.125	.14	21,600
August.....	1,450	83	335	.120	.14	20,600
September.....	3,800	96	694	.248	.28	41,300
The year.....	6,790	20	342	.122	1.66	248,000
1931-32						
October.....	4,780	209	971	.347	.40	59,700
November.....	9,410	201	2,210	.789	.88	132,000
December.....	4,100	878	1,450	.518	.60	89,200
January.....	4,850	1,200	2,280	.814	.94	140,000
February.....	4,710	1,170	2,560	.914	.99	147,000
March.....	2,930	1,140	2,000	.714	.82	123,000
April.....	5,760	793	1,420	.507	.57	84,500
May.....	7,370	878	1,780	.636	.73	109,000
June.....	7,540	942	2,770	.989	1.10	165,000
July.....	3,150	587	1,130	.404	.47	69,500
August.....	9,410	562	2,990	1.07	1.23	194,000
September.....	1,980	466	825	.295	.33	49,100
The year.....	9,410	201	1,860	.664	9.06	1,350,000

## 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. Gage datum lowered 2.00 feet Oct. 1, 1931.

DRAINAGE AREA.—508 square miles.

RECORDS available.—March 1922 to September 1932.

EXTREMES.—Maximum discharge during year, 6,000 second-feet May 30 (gage height, 15.96 feet); minimum, 29 second-feet Oct. 5 (gage height, 2.34 feet).

1922-32: Maximum discharge, about 15,000 second-feet July 7, 1929 (gage height, 22.33 feet, present datum); minimum, 1 second-foot Dec. 21, 1924, to Jan. 4, 1925.

REMARKS.—Records good except those for periods of ice effect, Jan. 7-12, 15, Jan. 30 to Feb. 8, Mar. 7-15, which are poor.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	34	216	1,000	160	280	128	106	662	95	76	260
2	37	37	200	426	160	300	128	106	1,170	94	216	144
3	31	42	192	280	160	242	136	98	448	1,890	81	113
4	32	39	192	320	160	242	113	106	600	696	67	98
5	29	37	176	320	160	224	113	120	494	168	52	92
6	1,390	36	160	216	208	216	106	1,160	172	128	113	81
7	898	36	160	208	242	176	320	808	176	113	192	77
8	144	39	168	208	320	176	144	260	1,330	98	92	74
9	75	39	192	242	494	176	128	184	3,170	98	64	71
10	60	37	224	320	1,200	176	113	168	924	97	52	67
11	820	37	1,160	572	1,200	176	113	152	470	90	51	60
12	288	60	470	846	426	208	98	144	270	83	1,710	98
13	330	70	260	1,000	242	224	98	128	224	78	426	73
14	152	65	216	470	233	242	98	120	172	70	1,080	67
15	97	56	208	426	216	280	95	106	174	64	1,760	60
16	80	49	200	448	494	300	300	136	170	64	600	53
17	65	58	208	494	924	404	144	113	152	62	1,040	52
18	65	80	200	544	448	208	120	113	152	59	340	50
19	60	70	216	600	448	200	144	106	242	52	152	60
20	56	70	208	382	382	184	152	95	176	51	128	74
21	53	70	192	696	404	136	208	94	170	50	120	176
22	51	97	184	426	494	128	160	98	136	81	106	113
23	51	5,180	184	340	300	216	144	90	128	78	94	83
24	48	2,600	176	224	280	470	152	81	120	106	90	63
25	44	572	160	242	300	280	184	106	120	76	84	64
26	42	300	176	320	340	224	144	92	128	64	92	53
27	44	260	144	300	320	192	128	84	278	51	128	53
28	42	260	152	320	300	176	120	78	128	48	97	48
29	40	280	160	208	260	144	120	81	113	44	81	48
30	40	260	160	176	-----	136	113	5,500	98	53	74	46
31	36	-----	2,120	160	-----	136	-----	1,500	-----	113	1,580	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,390	29	169	0.333	0.38	10,400
November	5,180	34	362	.713	.80	21,500
December	2,120	144	291	.573	.66	17,900
January	1,000	160	411	.806	.93	25,300
February	1,200	160	389	.766	.83	22,400
March	470	128	222	.437	.50	13,600
April	320	95	142	.280	.31	8,450
May	5,500	78	391	.770	.89	24,000
June	3,180	98	425	.837	.93	25,300
July	1,890	44	159	.313	.36	9,780
August	1,760	51	350	.689	.79	21,500
September	260	46	82.4	.163	.18	4,900
The year	5,500	29	282	.557	7.56	205,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 15,400 second-feet Aug. 15 (gage height, 15.00 feet); minimum, 25 second-feet Oct. 5 (gage height, 2.90 feet).

1922-32: Maximum discharge, 21,000 second-feet July 6, 1929; maximum gage height, 19.5 feet Sept. 3, 1926; minimum discharge, 6 second-feet June 1 and July 26, 1925; minimum gage height, 1.80 feet July 26, 1923.

REMARKS.—Records fair except those for periods of ice effect, Jan. 9-12, 30, 31, Feb. 1-9, Mar. 7-14, which are poor. Discharge estimated Mar. 1, Apr. 22, Sept. 5.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	49	1,630	3,320	850	1,140	374	393	952	354	144	1,000
2	42	51	1,320	2,200	900	1,220	354	374	654	246	2,120	702
3	33	53	1,160	1,560	900	1,380	354	335	2,890	230	1,320	540
4	31	42	1,060	1,160	800	1,110	263	374	2,440	475	316	393
5	25	40	952	1,160	702	800	280	413	2,040	1,270	280	336
6	1,160	40	850	1,000	702	562	280	1,060	1,270	354	144	263
7	4,060	30	750	900	750	475	1,380	2,120	518	246	1,500	246
8	3,320	33	607	952	800	433	562	2,040	433	230	518	263
9	1,760	31	607	1,000	1,060	433	654	1,560	354	354	183	213
10	496	35	702	1,110	1,320	433	413	1,270	1,270	230	108	204
11	1,830	37	3,680	1,440	2,610	433	316	952	702	198	183	204
12	1,160	61	2,520	2,280	1,760	433	280	750	1,970	156	1,970	298
13	1,270	952	1,560	3,320	1,060	433	246	654	750	144	2,700	900
14	562	413	1,000	2,120	850	475	246	562	952	131	8,710	607
15	354	335	607	1,500	750	518	230	518	475	120	9,970	298
16	213	189	607	1,060	800	562	246	540	413	97	5,320	246
17	156	562	702	1,000	1,830	654	298	454	393	97	5,480	183
18	144	850	702	1,060	2,120	702	263	454	316	97	4,860	175
19	131	1,060	702	900	1,830	702	246	413	1,160	86	2,990	198
20	108	654	800	1,270	1,760	607	280	354	518	97	1,000	198
21	76	335	750	2,610	3,320	518	183	316	335	213	702	263
22	67	952	702	2,280	2,360	518	906	298	263	120	607	316
23	76	13,200	654	1,440	1,830	433	1,630	280	246	562	454	316
24	53	12,200	562	1,160	1,220	562	952	263	198	213	433	298
25	60	9,760	518	750	952	850	952	298	213	97	374	213
26	131	3,440	496	850	1,060	1,060	900	263	1,760	86	374	183
27	144	2,200	454	952	1,220	900	654	246	2,440	76	496	183
28	144	2,040	454	1,000	1,160	654	496	230	1,270	67	562	164
29	183	2,040	433	1,060	1,060	540	433	213	750	61	433	138
30	108	1,760	433	952	-----	496	413	246	335	64	413	144
31	71	-----	6,900	800	-----	433	-----	1,220	-----	71	2,200	-----

Month	Maximum	Minimum	Mean	Per square mile	Run off	
					Inches	Acre-feet
October	4,060	25	581	0.469	0.54	35,700
November	13,200	30	1,780	1.44	1.61	106,000
December	6,900	433	1,120	1.903	1.04	68,900
January	3,320	750	1,420	1.15	1.33	87,300
February	3,320	702	1,320	1.06	1.14	75,900
March	1,380	433	660	.532	.61	40,600
April	1,630	183	503	.406	.45	29,900
May	2,120	213	628	.506	.58	38,600
June	2,890	198	943	.760	.85	56,100
July	1,270	61	221	.178	.21	13,600
August	9,970	108	1,830	1.48	1.71	113,000
September	1,000	138	323	.260	.29	19,200
The year	13,200	25	944	.761	10.36	685,000

## PLATTE RIVER BASIN (IOWA-MISSOURI)

## PLATTE RIVER AT CONCEPTION JUNCTION, MO.

LOCATION.—Chain gage on line between NW¼ sec. 14 and SW¼ sec. 11, T. 63 N., R. 34 W., at county highway bridge half a mile west of Conception Junction.  
DRAINAGE AREA.—492 square miles.

RECORDS AVAILABLE.—July 1921 to May 1925; August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 10,200 second-feet Nov. 24 (gage height, 17.12 feet); minimum discharge, 2.1 second-feet Nov. 11; minimum gage height, 4.02 feet Sept. 19, 25.

1921-25, 1928-32: Maximum discharge, 12,200 second-feet July 6, 1929 (gage height, 21.70 feet); minimum discharge, 0.1 second-foot Sept. 19, 1931.

REMARKS.—Records fair except those for periods of ice effect, Jan. 31 to Feb. 6, Mar. 7-16, which are poor. Discharge estimated Jan. 18, July 11, Sept. 30.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun?	July	Aug.	Sept.
1.....	13	26	463	4,480	161	349	91	63	109	53	12	349
2.....	9	14	376	2,370	181	596	86	61	48	43	1,840	117
3.....	4.6	11	376	936	181	596	91	58	2,21?	38	1,400	80
4.....	2.7	11	248	349	161	260	43	58	1,12?	61	323	74
5.....	2.4	10	248	272	142	260	38	56	37?	1,030	109	66
6.....	14	10	125	248	142	142	38	50	14?	236	125	48
7.....	1,030	8	125	248	142	109	48	53	9	94	1,070	46
8.....	2,990	8	171	152	142	94	562	181	73	43	982	43
9.....	779	2.4	181	152	181	94	142	248	66	30	225	38
10.....	283	2.7	284	192	272	94	80	109	1,79?	142	94	28
11.....	2,130	2.1	2,590	181	814	109	83	94	70?	106	80	23
12.....	950	106	2,530	202	982	109	66	80	40?	69	94	27
13.....	470	75	1,210	1,790	272	94	56	52	31?	24	2,700	25
14.....	717	1,420	665	2,150	181	94	58	45	93?	22	3,850	22
15.....	306	1,420	272	1,360	117	109	43	38	32?	13	3,930	22
16.....	178	562	272	528	142	109	45	40	24?	13	2,870	21
17.....	115	3,200	260	272	152	125	86	528	20?	12	3,680	22
18.....	72	1,910	284	232	1,120	171	58	102	6?	12	3,360	18
19.....	44	810	272	192	890	181	48	66	6?	10	2,060	17
20.....	29	414	272	248	738	161	61	56	5?	10	814	28
21.....	24	306	272	1,900	665	134	58	45	5?	14	376	30
22.....	18	470	323	1,740	890	134	1,900	28	4?	12	349	46
23.....	14	4,650	323	776	562	161	528	24	45	11	323	24
24.....	5	10,200	323	562	152	142	665	22	5?	38	83	22
25.....	5	8,200	323	376	134	310	562	20	27	17	80	* 17
26.....	39	2,870	310	214	134	323	248	19	19	11	83	18
27.....	414	630	214	202	432	152	142	19	35	11	86	28
28.....	113	494	214	181	403	142	117	18	6	10	58	27
29.....	56	463	181	161	376	125	94	17	5?	10	53	21
30.....	26	376	181	161	109	109	80	17	6?	9	52	18
31.....	30	-----	1,260	142	-----	109	-----	125	-----	13	53	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	2,990	2.4	351	0.713	0.82	21,600
November.....	10,200	2.1	1,290	2.62	2.92	76,800
December.....	2,590	125	489	.994	1.15	30,100
January.....	4,480	142	741	1.61	1.74	45,600
February.....	1,120	117	375	.762	.82	21,600
March.....	596	94	184	.374	.43	11,800
April.....	1,900	38	207	.421	.47	12,800
May.....	528	17	77.2	.157	.18	4,750
June.....	2,210	19	327	.665	.74	19,500
July.....	1,030	9	71.5	.145	.17	4,400
August.....	3,930	12	1,010	2.05	2.36	62,100
September.....	349	17	45.3	.092	.10	2,700
The year.....	10,200	2.1	430	.874	11.90	313,000

## PLATTE RIVER NEAR AGENCY, MO.

LOCATION.—Chain gage in NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 10, T. 56 N., R. 34 W., at bridge on State Highway 169, 3 $\frac{1}{2}$  miles northwest of Agency. Zero on gage is 803.0 feet above mean sea level.

DRAINAGE AREA.—1,760 square miles.

RECORDS AVAILABLE.—May to September 1932. May 1924 to August 1930 at site 4 miles downstream.

EXTREMES.—Maximum discharge during period, 11,100 second-feet June 4 (gage height, 18.42 feet); minimum discharge, 48 second-feet Sept. 21; minimum gage height, 2.58 feet July 31.

Maximum known stage since channel was straightened in 1921, 25.5 feet Sept. 18, 1926; discharge, 22,600 second-feet.

REMARKS.—Records good. Discharge estimated July 25, 26.

*Discharge, in second-feet, 1932*

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		2,780	204	101	300	16	244	2,020	109	5,900	67
2		750	186	105	1,130	17	349	795	98	6,300	69
3		4,980	150	2,540	580	18	660	2,720	91	6,220	57
4		10,500	1,330	1,230	435	19	750	1,130	73	7,200	54
5		8,380	3,020	840	266	20	288	1,960	70	4,980	56
6		3,200	3,380	336	195	21	204	795	62	1,850	48
7		1,230	1,230	255	141	22	168	452	59	660	123
8		885	349	1,030	131	23	141	336	64	420	94
9		580	277	930	112	24	123	277	101	324	62
10		1,580	234	750	94	25	119	660	95	277	59
11		3,620	405	375	80	26	116	505	89	266	56
12		2,180	266	214	94	27	105	336	84	288	62
13	255	2,600	186	540	75	28	87	1,080	80	255	57
14	234	1,630	150	3,200	67	29	84	362	63	244	62
15	195	2,300	123	4,840	59	30	84	244	56	186	56
						31	2,120		54	177	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
May 13-31	2,120	84	333	0.189	0.13	12,500
June	10,500	244	2,030	1.15	1.28	121,000
July	3,380	54	411	.234	.27	25,300
August	7,200	101	1,700	.966	1.11	105,000
September	1,130	48	158	.090	.10	9,400
The period						273,000

## KANSAS RIVER BASIN

## REPUBLICAN RIVER AT BENKELMAN, NEBR.

LOCATION.—Staff gage on line between secs. 17 and 20, T. 1 N., R. 37 W., three quarters of a mile west of Benkelman and a quarter of a mile above Arikaree River.

DRAINAGE AREA.—2,640 square miles.

RECORDS AVAILABLE.—November 1894 to August 1895; May 1903 to November 1906; March to June 1932.

EXTREMES.—Maximum discharge during year, 750 second-feet May 26 (gage height, 3.50 feet); minimum, 6 second-feet Oct. 1–12 (gage height, 1.01 feet). 1894–95, 1903–6, 1931–32: Maximum discharge, that of May 26, 1932; no flow during several months in 1906, 1931.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Feb. 29, Mar. 6–13, 15, 16. Small diversions upstream.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Jan.	Mar.	Apr.	May	June
1	6			52	52	42	90
2	6			52	52	42	76
3	6			52	42	42	76
4	6			64	42	42	76
5	6			64	42	42	155
6	6			60	42	42	185
7	6			54	42	42	173
8	6			52	42	42	138
9	6			54	42	42	110
10	6			54	42	42	90
11	6			58	42	42	95
12	6			60	52	42	642
13	7			62	52	42	690
14	7			64	52	42	606
15	7		* 94	70	42	42	548
16	7			85	32	28	352
17	7			76	32	24	207
18	7			64	32	24	168
19	7			64	32	24	168
20	7	* 38		64	32	24	
21	7			64	32	21	
22	7			52	32	21	
23	7			52	32	17	
24	7			52	134	17	98
25	7			52	250	64	98
26	20			52	190	570	83
27	20			52	134	278	80
28	24			52	76	166	76
29	28			52	64	144	64
30	28			52	52	120	64
31	28			52		101	
Month	Maximum	Minimum	Mean	Run-off in acre-feet			
October	28	6	10.0	615			
November			50	2,980			
December			75	4,610			
January			90	5,530			
February			75	4,310			
March			58.4	3,590			
April	250	32	61.2	3,640			
May	570	17	73.3	4,510			
June	690	64	192	11,400			
The period				41,200			

\* Result of discharge measurement.



## 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 1932.

EXTREMES.—Maximum discharge during year, 1,810 second-feet Aug. 1 (gage height, 2.86 feet); minimum, 4 second-feet July 19–23 (estimated).

1928–32: Maximum discharge, 1,810 second-feet June 4, 1930, Aug. 1, 1932; maximum gage height, 2.90 feet June 4, 1930; no flow during parts of summers of 1929–31.

REMARKS.—Records good. Discharge estimated Nov. 19 to Feb. 23, Mar. 7–14, July 10–23. Diversions for irrigation above station.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	78			190	142	206	216	74	1,170	43
2	20	74			180	128	211	171	54	206	38
3	22	74			171	132	200	161	61	5 <sup>39</sup>	32
4	23	82			156	142	195	200	54	3 <sup>99</sup>	27
5	18	95			100	137	180	345	50	180	24
6	27	100			128	123	156	345	40	1 <sup>90</sup>	27
7	31	104				109	171	264	35	176	30
8	32	104			100	128	176	222	25	151	25
9	38	113				137	166	161	21	128	23
10	38	118				151	161	161	18	118	24
11	40	142				146	151	195	15	87	25
12	50	142			110	128	142	696	12	65	22
13	43	142				104	123	430	8	174	23
14	54	161				87	123	300	5	273	23
15	65	151	200		118	91	123	336	5	171	20
16	59	142			228	78	123	211	5	128	18
17	54	142			195	74	128	151	5	174	20
18	54	137			176	87	109	128	5	82	20
19	50	135			166	87	74	421	4	70	19
20	54	140			166	87	65	354	4	59	24
21	59				176	78	61	244	4	52	32
22	59				161	70	56	200	4	37	35
23	65	160			166	87	50	161	4	27	37
24	61			228	161	166	47	128	32	31	37
25	70			206	166	318	61	402	23	25	40
26	70			200	137	273	965	195	21	22	52
27	70			200	146	233	345	176	14	430	78
28	65	180		190	156	309	264	132	10	273	95
29	70			195	166	300	238	113	8	118	82
30	65				146	244	318	104	374	87	61
31	70				146		228		1,430	59	

Month	Maximum	Minimum	Mean	R.m-off in acre-feet
October	70	18	48.8	3,000
November		74	136	8,090
December			160	9,840
January			180	11,100
February			150	8,630
March	228		146	8,980
April	318	70	146	8,690
May	965	47	181	11,100
June	696	104	244	14,500
July	1,430	4	78.2	4,810
August	1,100	22	174	10,700
September	95	18	35.2	2,090
The year	• 1,430	4	140	102,000

• Result of discharge measurement.

## 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 1932.

EXTREMES.—Maximum discharge during year, 3,570 second-feet July 31 (gage height, 3.5 feet); no flow July 1-3, July 15-30.

1931-32: Maximum discharge, that of July 31, 1932; no flow for several days during summers of 1931 and 1932.

REMARKS.—Records fair. Discharge estimated Oct. 1 to Mar. 2. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Nov.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			130	130	179	194	79	865	28
2			130	130	180	180	57	705	13
3			130	130	180	117	48	500	10
4			145	130	180	224	46	340	10
5			130	130	145	470	33	242	10
6			104	130	130	278	29	206	10
7			130	130	104	190	28	161	9
8			130	130	104	157	30	142	8
9			130	130	104	179	14	120	7
10			130	130	104	136	4	101	11
11			130	130	104	125	4	93	10
12			130	130	104	130	3	81	7
13			130	130	92	410	3	62	7
14			179	130	80	250	2	84	8
15		* 198	250	104	80	190	1	168	9
16			250	130	80	198	0	142	6
17			250	104	80	142	0	98	13
18			224	92	69	145	0	77	13
19			198	117	49	650	0	62	13
20		* 178	178	104	44	275	0	57	14
21			178	104	58	276	0	50	16
22			145	80	47	158	0	42	16
23			160	80	33	134	0	23	18
24			160	160	32	109	0	18	20
25			160	480	58	91	0	18	28
26			160	295	295	88	0	18	30
27			145	198	250	128	0	11	34
28			130	224	245	122	0	234	46
29			130	198	160	98	0	136	70
30			130	198	240	86	0	73	70
31			130		245		2,670	45	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October			60.0	3,690
November			165	9,820
December			170	10,500
January			190	11,700
February			160	9,200
March	250	104	156	9,590
April	480	80	150	8,930
May	295	32	122	7,500
June	650	86	193	11,500
July	2,670	0	98.4	6,050
August	865	11	160	9,840
September	70	6	18.8	1,120
The year	2,670	0	137	99,400

\* Result of discharge measurement.

## REPUBLICAN RIVER AT McCOOK, NEBR.

LOCATION.—Staff gage in sec. 32, T. 3 N., R. 29 W., at highway bridge half a mile south of McCook.

DRAINAGE AREA.—9,790 square miles.

RECORDS AVAILABLE.—March 1931 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 5,450 second-feet June 19 (gage height, 7.5 feet); minimum, 21 second-feet May 21 (gage height, 3.05 feet).

1931-32: Maximum discharge, that of June 19, 1932; no flow several days during July and August 1931.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Feb. 29, Mar. 4-14. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Mar.	Apr.	May	June	Day	Oct.	Mar.	Apr.	May	June
1.....	23	345	290	345	318	16.....	41	665	240	190	290
2.....	23	345	318	345	1,840	17.....	62	540	240	168	290
3.....	23	345	345	345	805	18.....	100	455	240	122	570
4.....	26	320	345	345	372	19.....	100	455	240	100	2,200
5.....	26	300	345	345	840	20.....	100	455	240	100	1,040
6.....	26	260	345	290	920	21.....	100	400	240	52	735
7.....	26		318	290	455	22.....	62	345	240	26	600
8.....	26		290	290	400	23.....	62	345	240	23	482
9.....	29		290	290	318	24.....	62	345	240	21	318
10.....	29		345	265	1,290	25.....	62	290	455	52	240
11.....	29	300	290	240	482	26.....	100	290	510	240	290
12.....	41		290	215	318	27.....	100	290	428	570	455
13.....	41		290	190	700	28.....	145	290	428	372	240
14.....	41		290	190	510	29.....	145	240	400	345	145
15.....	41		290	190	318	30.....	145	240	372	482	100
						31.....	145	265	-----	400	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	145	23	63.9	3,930
November.....	-----	-----	185	11,000
December.....	-----	-----	180	11,100
January.....	-----	-----	210	12,900
February.....	-----	-----	225	12,900
March.....	665	240	341	21,000
April.....	510	240	314	18,700
May.....	570	21	240	14,800
June.....	2,200	100	596	35,500
The period.....	-----	-----	-----	142,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 7,370 second-feet Feb. 24 (gage height, 7.37 feet); minimum, 28 second-feet Oct. 11 (gage height, 0.6 foot).

1929-32: Maximum discharge, 11,000 second-feet June 5, 1930 (gage height, 8.54 feet); minimum, 17 second-feet Sept. 16, 1931 (gage height, 0.54 foot).

REMARKS.—Records good except those for Nov. 27 to Feb. 23, which were based on two discharge measurements and temperature records. Minor diversions for irrigation.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	81	116	170	210	270	989	546	735	1,070	683	754	54	
2	46	123				961	546	702	2,320	612	905	54	
3	46	128				926	528	664	2,840	464	1,490	46	
4	45	144				849	528	592	2,460	442	1,400	52	
5	48	152	180	180	440	780	540	540	1,810	800	996	67	
6	39	164				774	534	534	1,680	638	856	57	
7	36	171				794	486	528	1,770	442	780	52	
8	36	180				680	474	486	1,460	1,210	683	48	
9	36	177	170	180	440	480	447	469	2,980	822	780	48	
10	36	174				320	469	452	1,640	224	540	54	
11	32	171				270	480	408	2,060	198	447	2,420	
12	49	171				270	464	398	2,270	155	1,150	2,910	
13	48	190	170	160	420	370	464	386	2,080	136	498	1,750	
14	70	299				540	452	344	1,350	125	289	1,010	
15	106	257				644	452	313	1,060	123	253	344	
16	90	228				849	452	313	1,060	102	177	184	
17	79	220	160	279	380	842	442	289	960	90	150	138	
18	68	220				982	436	275	1,770	84	133	104	
19	70	236				982	447	253	1,730	84	141	81	
20	63	299				849	420	228	2,360	77	133	72	
21	72	354	220	300	500	849	676	209	2,580	66	138	62	
22	73	370				1,500	800	598	180	1,800	168	123	55
23	75	354				2,500	742	528	190	1,330	308	100	52
24	77	266				6,940	702	425	168	1,120	224	96	51
25	84	194	250	280	1,980	3,160	664	420	164	977	190	84	
26	72	187				1,980	657	386	177	933	187	81	54
27	77	170				1,440	644	381	386	1,330	190	77	51
28	84					1,210	624	598	474	1,330	108	77	49
29	84					1,080	598	702	469	933	88	77	45
30	84					598	664	828	784	130	75	44	
31	96					579		1,530		220	65		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	106	32	64.6	3,970
November	370	116	208	12,400
December			194	11,900
January			240	14,800
February	6,940		961	55,300
March	989	270	697	42,900
April	702	381	500	29,800
May	1,530	164	441	27,100
June	2,930	754	1,650	98,200
July	1,210	66	293	18,000
August	1,490	65	437	26,900
September	2,910	44	335	19,900
The year	6,940	32	498	361,000

## REPUBLICAN RIVER AT BOSTWICK, NEBR.

LOCATION.—Chain gage in sec. 23, T. 1 N., R. 8 W., 1 mile southwest of Bostwick.

DRAINAGE AREA.—20,300 square miles.

RECORDS AVAILABLE.—June 1904 to September 1914; February to June 1932 (discontinued). From June 1896 to November 1903 station maintained at Superior.

EXTREMES.—Maximum discharge during year, about 32,000 second-feet Feb. 25 (gage height, 10.09 feet); minimum occurred during October.

1904-14, 1932: Maximum discharge, that of Feb. 25, 1932; minimum, 6 second-feet Aug. 27 to Sept. 7, 1913 (gage height, 0.4 foot).

REMARKS.—Records good except those for Feb. 1-24, 26, which were estimated.

Discharge not computed Oct. 1 to Jan. 31. Minor diversions above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June
1					1,350	540	720	1,580
2					1,160	540	720	2,640
3					1,040	524	790	4,220
4					920	564	750	5,960
5					832	532	683	3,200
6					832	524	638	2,500
7					810	548	656	2,500
8					500	532	612	2,260
9					250	524	612	2,160
10					200	524	548	4,130
11					250	524	532	3,140
12					700	524	508	3,820
13					1,290	524	468	1,900
14					1,350	524	453	4,160
15					1,260	540	453	1,580
16					1,370	540	453	1,160
17					1,430	540	439	1,220
18					810	540	390	1,170
19					920	556	366	1,260
20					1,020	548	360	-----
21					898	524	325	-----
22					710	1,430	310	-----
23					692	720	305	-----
24					656	692	290	-----
25					656	596	280	-----
26					8,000	656	508	290
27					2,640	596	476	290
28					2,010	580	468	285
29					1,570	540	476	468
30					516	821	532	-----
31					524	-----	620	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February	21,900	-----	2,970	171,000
March	1,430	200	817	50,200
April	1,430	468	591	35,200
May	790	280	489	30,100
June 1-19	5,960	1,160	2,660	100,000
The period				336,000

\* Result of discharge measurement.

## 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.

RECORDS AVAILABLE.—May to September 1932.

EXTREMES.—Maximum discharge during period, 5,420 second-feet June 4 (gage height, 8.1 feet); minimum not determined.

REMARKS.—Records fair. Discharge estimated June 28 to July 19, Aug. 16 to Sept. 22. Power plant 8 miles above station regulates flow.

## Discharge, in second-feet, 1932

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1.....		666	730	680	54	16.....		1,160	190	350	700
2.....		2,150	730	329	54	17.....		1,010	170	255	450
3.....		3,140	570	931	38	18.....		980	162	235	350
4.....		3,420	570	1,340	42	19.....	364	1,060	144	163	250
5.....		3,830	510	1,370	36	20.....	351	2,300	126	148	150
6.....		2,660	360	1,540	38	21.....	338	1,720	133	125	125
7.....		2,380	570	787	34	22.....	329	3,300	131	110	120
8.....		1,940	730	659	34	23.....	303	2,250	162	140	112
9.....		1,910	570	562	35	24.....	299	1,720	316	145	112
10.....		2,680	360	540	36	25.....	287	1,560	212	110	102
11.....		2,260	730	535	41	26.....	312	1,670	295	100	99
12.....		3,050	350	450	1,800	27.....	308	1,870	226	80	95
13.....		2,260	220	475	3,500	28.....	316	1,500	193	70	102
14.....		2,890	215	666	2,200	29.....	364	1,000	274	70	97
15.....		1,630	200	475	800	30.....	480	1,100	325	60	90
						31.....	540		470	150	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 19-31.....	540	287	353	9,100
June.....	3,830	666	2,040	121,000
July.....	730	126	353	21,700
August.....	1,540	60	440	27,100
September.....	3,500	34	390	23,200
The period.....				202,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 7,270 second-feet Feb. 25 (gage height, 7.78 feet); minimum, 50 second-feet Sept. 3 (gage height, 1.87 feet).

1919-25, 1928-32: Maximum discharge, 16,700 second-feet June 12, 1923 (gage height, 11.4 feet); minimum, 2 second-feet Oct. 9, 13, 16, 1923 (gage height, 1.50 feet). Bank-full stage, 9 feet.

Maximum stage known, 14.2 feet June 30, 1915.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 7 to Feb. 16, Mar. 8-15. Discharge interpolated Dec. 16.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	194	123	236	720	325	1,600	630	785	545	820	1,260	91	
2.....	162	132	286	630		1,480	630	742	1,490	820	435	89	
3.....	250	144	266	550		1,370	630	742	2,430	630	470	63	
4.....	162	150	282	470		1,260	630	828	2,430	630	1,260	69	
5.....	159	162	258	400		1,150	630	785	4,350	550	1,720	60	
6.....	102	147	262	290	345	1,040	630	742	2,840	400	1,830	64	
7.....	93	187	290	350		930	550	742	2,560	630	1,150	56	
8.....	95	208	340			550	700	2,060	820	820	56	58	
9.....	72	208	236			550	828	2,180	630	820	53	60	
10.....	102	194	435			550	660	1,940	400	720	60	58	
11.....	159	226	470	300	345	1,000	550	582	2,840	820	930	68	
12.....	218	215	470				550	545	2,700	370	820	87	
13.....	340	215	470				470	545	2,700	250	930	3,570	
14.....	266	229	315				470	509	3,270	246	720	2,840	
15.....	153	250	370				470	509	2,060	222	1,040	1,490	
16.....	138	246	342	350	2,840	1,370	470	545	1,480	212	470	870	
17.....	115	286	315			1,040	470	473	1,150	190	340	785	
18.....	138	254	315			1,150	550	509	1,260	180	315	441	
19.....	135	246	340			2,180	930	550	473	1,260	159	243	305
20.....	135	270	400			2,060	1,040	473	441	2,300	144	232	246
21.....	129	370	400	325	2,060	1,150	545	409	1,940	123	212	214	
22.....	126	435	435			2,300	930	509	409	3,270	118	208	199
23.....	120	315	370			2,060	820	353	381	2,300	132	198	187
24.....	115	550	400			5,650	930	700	353	1,720	290	212	175
25.....	115	290	470			7,080	820	785	353	1,260	290	165	166
26.....	126	315	550	325	5,310	820	582	381	1,150	250	141	166	
27.....	118	270	630			3,270	720	509	329	1,940	315	112	166
28.....	129	315	630			2,430	720	545	353	1,600	212	102	166
29.....	123	370	630			1,940	720	509	353	1,040	270	108	175
30.....	120	315	630			630	473	473	1,150	340	87	166	
31.....	120	720	720	720	630	630	620	620	720	222	222	166	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	340	72	146	8,980
November.....	550	123	255	15,100
December.....	720	236	405	24,900
January.....	720	-----	368	22,600
February.....	7,080	-----	1,870	108,000
March.....	1,600	630	1,010	62,000
April.....	785	353	550	32,800
May.....	828	329	552	33,900
June.....	4,350	545	2,040	121,000
July.....	820	118	393	24,200
August.....	1,830	87	590	36,300
September.....	3,570	56	438	26,100
The year.....	7,080	56	711	516,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 8,760 second-feet Sept. 1 (gage height, 8.85 feet); minimum, 54 second-feet Oct. 10 (gage height, 2.06 feet).

1917-32: Maximum discharge, 20,100 second-feet June 4, 1923 (gage height, 12.86 feet); minimum, 8 second-feet Sept. 19, 1931. Bank-full stage, 11 feet.

REMARKS.—Record fair. Discharge interpolated Dec. 26, Jan. 25, 31.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	238	77	542	600		2,770	872	542	420	1,160	442	7,860
2	164	87	465	600		2,380	872	515	465	1,260	515	2,870
3	146	74	442	465		2,000	872	542	1,360	1,060	570	1,370
4	215	84	378	465		1,780	800	695	990	872	630	760
5	122	70	420	422		1,670	730	662	2,250	835	465	521
6	164	87	399	378	350	1,560	730	662	3,030	1,260	600	422
7	189	74	378	276		1,360	730	1,460	3,310	910	1,080	340
8	104	168	357	490		1,460	730	990	2,380	800	1,030	300
9	94	97	357	316		695	695	990	2,120	695	1,030	300
10	64	150	378	378		600	662	835	1,890	662	730	201
11	142	132	420	442			630	765	2,000	730	662	168
12	800	153	442	442	1,460	990	630	800	2,000	600	695	204
13	1,360	186	515	399	1,260	990	630	662	2,770	542	1,670	197
14	1,360	208	515	357	950	1,160	600	662	2,770	600	1,370	175
15	950	257	465	357	1,460	1,460	600	600	2,250	465	830	980
16	765	200	490	378	1,560	1,160	600	570	2,380	420	694	2,140
17	515	253	542		1,780	1,360	600	570	1,780	399	760	1,370
18	357	246	490		2,120	1,360	570	515	1,360	336	604	905
19	257	257	399		2,000	1,360	910	515	1,890	316	446	760
20	208	276	378		1,670	1,260	872	490	2,380	296	422	632
21	197	257	378	300	1,460	1,260	835	465	1,360	257	340	980
22	175	276	399		1,560	1,160	662	465	1,560	242	300	1,480
23	175	357	399		1,670	1,160	662	442	1,670	204	280	760
24	178	1,360	399		2,120	1,160	1,030	420	2,640	238	242	380
25	139	2,000	442	465	6,160	1,360	1,260	399	2,770	257	223	300
26	111	1,560	420	515	7,820	1,260	950	442	2,000	227	193	261
27	118	872	399	542	5,820	1,160	800	420	1,780	204	150	300
28	97	630	442	465	4,210	1,080	730	399	1,360	378	136	380
29	77	600	490	336	3,310	990	630	420	1,890	257	105	261
30	84	490	570	378	-----	950	570	442	1,560	399	107	179
31	77	-----	570	350	-----	910	-----	442	-----	378	795	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,360	64	311	19,100
November	2,000	70	385	22,900
December	570	357	441	27,100
January	600	276	394	24,200
February	7,820	-----	1,800	104,000
March	2,770	-----	1,300	80,200
April	1,260	570	749	44,600
May	1,460	399	606	37,300
June	3,310	420	1,950	116,000
July	1,260	204	557	34,300
August	1,670	105	584	35,900
September	7,860	168	925	55,100
The year	7,860	64	827	600,000



## KANSAS RIVER AT OGDEN, KANS.

LOCATION.—Chain gage in SE¼ 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 1932.

EXTREMES.—Maximum discharge during year, 14,200 second-feet July 6 (gage height, 13.54 feet); minimum, 360 second-feet Nov. 5, 7, 9 (gage height, 5.00 feet).  
1917-32: Maximum discharge, 32,600 second-feet June 10, 1923 (gage height, 18.15 feet); minimum, 103 second-feet Oct. 30, 1922. Bank-full stage, 18 feet.

REMARKS.—Records good except those for July and August and those for period of ice effect, Jan. 6-8, Jan. 30 to Feb. 7, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	572	445	1,020	870	650	3,910	1,380	1,020	760	3,080	945	2,850
2	470	400	945	908		3,300	1,380	945	692	2,420	1,020	6,300
3	422	400	945	908		2,880	1,280	945	520	2,850	760	5,720
4	495	400	870	870		2,500	1,280	945	1,960	2,960	1,260	6,490
5	520	380	760	795		2,280	1,200	1,020	2,880	4,130	1,260	5,910
6	495	400	760	600	834	2,060	1,200	1,020	4,600	14,200	908	3,490
7	470	380	795			1,960	1,110	2,740	4,600	10,800	908	2,200
8	445	380	760			1,660	1,110	2,280	3,600	8,520	1,350	1,440
9	422	380	725			1,200	1,110	1,960	2,880	10,500	1,350	1,260
10	422	380	725			1,020	1,110	1,660	2,620	11,300	1,260	1,100
11	445	422	725	600	1,020	1,280	1,110	1,460	2,380	8,950	1,100	945
12	445	445	725	600	1,110	1,380	1,020	1,280	3,010	4,130	1,020	945
13	945	445	795	795	1,860	1,380	1,020	1,200	4,420	2,630	945	834
14	1,380	1,110	834	692	1,460	1,380	1,020	1,110	3,750	2,000	1,800	795
15	1,380	1,560	834	520	1,200	1,460	945	1,020	3,910	1,710	1,710	795
16	1,110	1,020	834	545	1,560	1,460	945	1,110	3,300	1,440	2,000	2,960
17	908	1,020	795	630	1,960	1,560	1,020	945	3,440	1,350	1,620	7,690
18	795	725	760	660	2,170	1,660	1,020	908	2,500	1,180	1,900	8,100
19	795	660	795	630	2,380	1,760	1,020	908	2,380	1,180	2,200	7,080
20	692	600	692	795	2,500	1,760	1,110	908	9,170	1,020	1,620	5,170
21	600	630	725	725	2,170	1,760	1,020	834	7,480	945	1,180	3,080
22	572	630	725	760	2,060	1,660	1,200	834	6,300	908	945	4,640
23	520	1,960	725	834	2,170	1,760	1,280	760	5,530	725	870	3,490
24	495	2,280	725	760	2,280	1,760	1,200	760	3,960	834	795	2,310
25	495	2,280	725	760	2,740	1,960	1,560	725	4,640	834	692	1,710
26	422	2,380	795	692	8,250	1,960	1,380	760	3,960	870	692	1,440
27	422	1,860	692	725	8,050	1,860	1,460	834	3,640	834	725	1,440
28	445	1,380	725	660	5,690	1,760	1,280	760	3,080	795	630	1,440
29	445	1,110	795	600	4,600	1,660	1,110	692	2,960	908	630	1,530
30	422	1,200	795	545	-----	1,560	1,110	795	3,350	1,020	520	1,260
31	422	-----	834	545	-----	1,460	-----	834	-----	1,260	600	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,380	422	609	37,500
November	2,380	380	922	54,900
December	1,020	692	786	48,300
January	908	520	688	42,300
February	8,250	-----	2,160	124,000
March	3,910	1,110	1,840	113,000
April	1,560	945	1,160	69,200
May	2,740	692	1,100	67,400
June	9,170	520	3,610	215,000
July	14,200	725	3,430	211,000
August	2,200	520	1,140	69,800
September	8,100	795	3,150	187,000
The year	14,200	380	1,710	1,240,000

## 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 1932. Inter-mittent observations made by United States Weather Bureau 1914-19.

EXTREMES.—Maximum discharge during year, 22,200 second-feet Nov. 25 (gage height, 10.2 feet); minimum, 590 second-feet Nov. 8, 9, 10 (gage height, 1.7 feet).

1919-32: Maximum discharge, 53,400 second-feet May 8, 1930 (gage height, 16.3 feet); minimum, 330 second-feet in October 1922. Bank-full stage, 15 feet.

REMARKS.—Records good except those for period of ice effect, Feb. 1-8 and those for August and September, which are fair.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,680	800	3,490	1,850	2,000	8,790	2,760	2,120	1,680	4,870	1,960	3,510
2.....	1,680	720	3,300	2,430		8,300	2,760	1,980	3,320	4,470	1,820	16,600
3.....	1,540	720	3,110	3,110		5,340	2,760	1,850	2,960	4,080	1,820	8,520
4.....	1,540	650	2,760	2,270		6,670	2,430	1,720	6,100	4,080	3,700	5,890
5.....	1,410	650	2,590	2,270		6,000	2,270	1,720	11,400	4,470	5,680	7,150
6.....	1,410	650	2,590	1,980	2,590	5,130	2,120	1,850	12,700	10,000	6,310	5,470
7.....	1,290	650	2,430	1,850		4,710	2,120	2,120	10,700	14,800	4,870	3,320
8.....	1,290	650	2,120	1,850		3,490	2,120	4,710	10,000	10,700	3,510	2,440
9.....	1,180	590	2,120	1,850		2,120	2,120	3,510	11,000	11,000	3,510	1,820
10.....	980	650	2,120	1,850		2,760	2,120	2,960	10,700	12,000	3,140	1,820
11.....	1,820	650	2,120	1,590	3,880	1,850	1,980	2,610	7,800	12,000	2,440	1,290
12.....	7,800	720	2,120	1,590	5,560	2,430	1,980	2,270	7,800	8,520	2,440	1,290
13.....	7,360	720	2,120	1,590	9,310	3,110	1,850	2,110	7,360	5,680	2,110	1,080
14.....	5,890	1,680	2,270	1,590	9,310	2,930	1,850	2,270	8,020	3,890	2,780	1,080
15.....	5,270	2,610	2,760	1,590	6,900	3,110	1,850	2,110	6,940	3,320	3,890	1,080
16.....	4,080	2,610	2,430	1,590	3,880	3,110	1,850	1,960	7,150	2,960	3,890	980
17.....	2,960	2,440	2,120	1,590	3,880	3,110	1,850	1,820	6,520	2,610	4,270	5,070
18.....	2,270	1,960	2,120	1,720	3,490	3,110	1,850	1,680	5,070	2,270	3,510	7,360
19.....	1,820	1,680	2,120	1,850	3,490	3,490	1,850	1,540	5,070	2,110	3,320	7,150
20.....	1,540	1,960	2,120	1,590	3,680	3,490	2,120	1,410	9,680	2,110	3,320	6,310
21.....	1,290	1,680	1,850	1,590	6,000	3,680	2,120	1,410	10,000	2,960	2,440	4,670
22.....	1,290	1,820	1,850	2,760	5,130	3,490	2,120	1,410	8,260	2,270	2,110	4,470
23.....	1,180	3,320	1,850	4,500	3,880	3,110	2,430	1,290	7,360	1,960	1,820	8,800
24.....	1,180	10,000	1,850	3,110	6,000	3,110	2,430	1,180	6,940	1,960	1,540	6,310
25.....	1,080	20,600	1,720	2,430	7,820	3,490	2,270	1,180	5,680	1,820	1,540	3,890
26.....	890	15,600	1,720	2,120	7,360	4,500	2,270	1,180	5,680	1,820	1,540	3,140
27.....	980	9,850	1,590	2,120	12,500	4,710	2,120	1,180	5,270	1,820	1,540	2,610
28.....	890	7,360	1,590	2,120	11,300	4,080	2,430	1,180	5,270	2,110	1,290	2,110
29.....	800	5,130	1,590	2,120	9,580	3,490	2,120	1,180	5,270	1,960	1,080	2,110
30.....	800	3,680	1,590	2,120	-----	3,110	2,120	1,180	5,070	1,960	1,290	2,110
31.....	800	-----	1,720	2,120	-----	2,760	-----	1,410	-----	1,960	1,290	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	7,800	800	2,130	131,000
November.....	20,600	590	3,430	204,000
December.....	3,490	1,590	2,190	135,000
January.....	4,500	1,590	2,090	128,000
February.....	12,500	-----	4,980	286,000
March.....	8,790	1,720	3,920	241,000
April.....	2,760	1,850	2,170	129,000
May.....	4,710	1,180	1,870	115,000
June.....	12,700	1,680	7,230	430,000
July.....	14,800	1,820	4,790	295,000
August.....	6,310	1,080	2,770	170,000
September.....	16,600	980	4,320	257,000
The year.....	20,600	590	3,470	2,520,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 25,600 second-feet Nov. 24 (gage height, 12.7 feet); minimum, 940 second-feet Nov. 4 (gage height, 2.3 feet).

1917-32: Maximum discharge, 73,700 second-feet June 10, 1923 (gage height, 21.5 feet); minimum, 480 second-feet in January 1925.

REMARKS.—Records good except those estimated for period of ice effect, Jan. 14, 15, Jan. 30 to Feb. 8, Mar. 10-15, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,270	990	5,870	2,780		9,710	3,510	2,780	2,120	5,580	2,120	1,980
2	2,430	990	5,270	3,320		9,270	2,960	2,780	2,600	5,200	2,430	1,840
3	2,270	990	4,870	3,700		8,610	2,960	2,600	4,080	4,440	5,270	14,500
4	1,980	940	4,470	3,890		7,960	2,780	2,600	3,140	13,600	2,120	8,830
5	1,840	990	4,080	3,890	2,200	7,120	2,600	2,270	7,960	6,770	5,070	7,750
6	1,700	960	3,700	3,140		6,280	2,600	2,270	11,000	10,200	6,280	8,170
7	1,570	990	3,700	2,960		5,670	2,430	2,960	11,500	13,000	6,700	6,280
8	1,310	990	3,510	2,960		5,070	2,270	5,270	9,170	14,500	5,270	4,270
9	1,230	990	3,320	2,120	2,600	4,670	2,270	4,870	10,000	12,400	4,270	2,960
10	1,230	990	3,510	2,270	2,780		2,120	6,070	11,000	12,000	4,080	2,270
11	1,160	960	4,080	2,430	3,890		2,120	4,670	9,170	14,200	3,510	1,980
12	1,160	1,040	4,670	2,270	4,080	3,000	2,120	3,890	7,370	13,200	2,960	1,840
13	9,270	1,230	3,890	2,780	5,270		2,120	3,320	7,170	9,490	2,600	1,570
14	7,330	5,270	3,510	2,600	9,270		1,980	3,140	7,170	6,700	3,510	1,310
15	6,490	13,400	4,080	2,500	8,610		1,980	3,140	8,170	5,070	6,070	1,230
16	5,470	8,610	3,890	2,430	6,070	3,320	1,980	4,470	6,970	4,080	5,870	1,310
17	4,470	19,200	3,700	2,600	4,470	3,700	4,270	2,960	7,370	3,700	4,470	1,160
18	2,960	11,700	3,320	2,960	5,470	3,510	2,270	2,960	6,570	3,140	5,270	4,870
19	2,270	5,670	2,960	2,600	5,670	3,510	1,980	2,430	6,370	2,960	4,080	8,170
20	1,980	3,890	2,960	2,600	6,070	3,510	6,070	2,270	13,900	2,430	3,890	8,170
21	1,840	3,700	2,960	2,600	6,280	4,080	4,470	2,120	14,500	2,430	3,890	6,910
22	1,570	3,510	2,780	3,700	6,700	3,890	3,510	1,980	10,000	2,430	3,140	6,700
23	1,440	4,670	2,780	5,470	5,870	3,510	3,510	1,980	8,970	2,960	2,430	6,490
24	1,440	25,600	2,780	4,870	6,280	3,700	3,320	1,840	7,570	2,430	2,120	10,400
25	1,310	20,500	2,600	3,700	8,830	4,470	3,320	1,840	7,370	2,430	1,840	6,490
26	1,230	21,200	2,600	3,140	7,960	4,470	3,140	1,840	8,170	2,270	1,840	5,070
27	1,160	16,300	2,430	2,960	7,120	4,670	3,320	1,840	10,500	2,270	1,570	3,700
28	1,090	10,400	2,430	2,780	12,400	4,670	2,960	1,840	6,170	2,120	1,440	4,270
29	1,090	7,960	2,430	2,780	11,300	4,270	3,140	1,840	5,770	2,120	1,310	2,960
30	990	6,700	2,430	2,600		3,700	2,960	1,840	5,390	2,270	1,310	2,600
31	990		2,430	2,400		3,510		2,270		2,120	1,310	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	9,270	990	2,400	148,000
November	25,600	940	6,710	399,000
December	5,870	2,430	3,480	214,000
January	5,470	2,120	3,030	186,000
February	12,400		5,330	307,000
March	9,710		4,670	287,000
April	6,070	1,980	2,900	173,000
May	6,070	1,840	2,870	176,000
June	14,500	2,120	7,910	470,000
July	14,500	2,120	6,080	374,000
August	6,700	1,310	3,380	208,000
September	14,500	1,160	4,870	290,000
The year	25,600	940	4,450	3,230,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 63,600 second-feet Nov. 24 (gage height, 17.22 feet); minimum, 1,170 second-feet Nov. 8, 9 (gage height, 3.32 feet).

1917-32: Maximum discharge, 110,000 second-feet Apr. 21, 1929 (gage height, 22.20 feet); minimum, 650 second-feet during January 1925.

REMARKS.—Records good except those for October to December, July and August, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,750	1,330	8,460	8,210	2,270	11,000	4,080	4,300	8,770	6,300	2,420	2,420
2	3,230	1,330	7,250	13,100	2,580	9,700	3,860	3,860	5,970	6,300	2,420	3,100
3	3,230	1,330	6,770	8,710	2,580	9,080	3,860	3,230	3,640	5,940	2,750	5,610
4	3,040	1,250	6,300	5,610	2,580	8,460	3,430	3,430	4,520	5,380	2,420	11,000
5	3,040	1,250	6,070	7,010	2,580	8,160	3,230	3,230	3,860	30,600	2,580	8,550
6	2,690	1,170	5,610	8,210	2,920	7,280	3,230	3,230	6,730	30,600	2,920	3,190
7	2,530	1,250	5,160	7,010	3,470	6,470	3,230	3,860	11,000	18,700	6,070	7,680
8	2,220	1,250	5,160	4,940	4,080	5,970	3,230	2,470	12,300	16,100	6,300	6,140
9	2,080	1,170	4,940	4,080	3,870	5,220	3,230	7,000	12,600	12,800	5,160	4,780
10	2,080	1,250	6,070	3,870	3,670	3,230	3,040	5,970	17,200	10,500	4,290	3,560
11	2,220	1,330	7,490	4,080	3,670	2,860	3,040	6,470	15,900	11,200	4,080	3,190
12	2,530	1,420	9,710	4,500	4,940	3,040	3,040	4,980	11,000	11,500	3,670	3,010
13	2,860	2,220	8,460	4,940	4,940	2,690	2,690	4,300	9,590	10,200	3,670	2,840
14	9,390	6,220	7,250	8,710	6,070	3,430	2,690	3,860	8,770	7,730	3,470	2,510
15	8,160	35,300	5,840	7,730	8,460	4,080	2,690	3,430	8,770	6,070	3,670	2,360
16	6,470	31,900	5,610	4,940	7,730	5,220	2,690	3,430	8,460	4,940	6,070	2,360
17	5,470	26,600	5,380	4,290	6,300	5,220	4,080	5,720	7,570	4,290	5,610	2,100
18	4,520	48,200	5,160	4,500	6,070	4,520	6,730	4,080	7,860	3,870	4,720	2,220
19	3,430	30,200	4,500	4,500	6,300	4,300	5,220	3,230	7,570	3,100	4,940	3,370
20	2,860	14,600	4,500	4,290	6,070	4,300	6,730	3,040	10,300	3,280	4,080	7,400
21	2,220	9,080	4,500	4,500	6,300	4,520	12,300	2,690	25,600	3,100	3,870	7,400
22	2,220	11,000	4,500	4,940	6,770	4,750	8,460	2,530	14,100	2,750	4,080	6,870
23	2,220	33,000	4,290	5,380	6,530	4,300	6,220	2,370	9,960	3,670	3,280	7,970
24	1,950	60,200	4,080	6,070	6,070	4,520	7,280	2,530	8,960	3,280	2,920	8,550
25	1,830	55,000	3,870	5,610	6,770	6,470	8,160	2,370	8,210	2,750	2,580	9,450
26	1,610	44,000	3,870	4,720	8,210	7,860	5,970	2,080	7,730	2,580	2,420	6,870
27	1,720	26,100	3,870	4,290	7,490	6,470	5,220	1,950	8,960	2,750	2,580	5,220
28	1,610	16,100	3,870	4,290	8,210	5,720	4,750	2,220	10,200	2,920	2,920	4,570
29	1,510	11,800	3,470	4,080	12,600	5,470	4,300	2,080	7,250	2,580	3,280	5,220
30	1,510	9,710	3,470	3,670	-----	5,220	4,300	2,220	6,530	2,580	2,420	3,750
31	1,330	-----	3,870	2,130	-----	4,750	-----	2,370	-----	2,420	2,000	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	9,390	1,330	3,110	191,000
November	60,200	1,170	16,200	965,000
December	9,710	3,470	5,460	336,000
January	13,100	2,130	5,580	343,000
February	12,600	2,270	5,520	318,000
March	11,000	2,690	5,620	346,000
April	12,300	2,690	4,700	280,000
May	7,000	1,950	3,600	221,000
June	25,600	3,640	9,660	575,000
July	30,600	2,420	7,760	477,000
August	6,300	2,000	3,670	225,000
September	11,000	2,100	5,110	304,000
The year	60,200	1,170	6,310	4,580,000

## 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 to September 1932.

EXTREMES.—Maximum discharge during period, 2,330 second-feet Aug. 27 (gage height, 6.1 feet); minimum, 1 second-foot Sept. 14–16 (gage height, 1.05 feet).

REMARKS.—Records good. Discharge estimated Mar. 1, 2, 7–12. Discharge not computed October to February. Small diversions for irrigation above station.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.				30	15	41	12	13	39	21
2.				30	15	37	6	11	675	21
3.				28	15	28	16	6	128	15
4.				30	15	28	49	8	56	14
5.				26	15	28	34	15	42	13
6.				28	15	26	26	6	28	8
7.				26	15	32	26	6	28	8
8.				24	15	28	24	4	27	6
9.				22	15	24	18	4	22	3
10.				18	15	22	21	2	21	3
11.				20	15	22	52	3	17	3
12.				28	15	22	34	2	14	3
13.		a 2		30	15	22	27	3	133	3
14.				32	15	22	13	1	26	1
15.		a 618		39	15	22	13	.4	14	1
16.				62	15	22	13	.4	12	1
17.				58	15	21	13	.4	16	3.
18.				41	18	16	10	.2	14	3
19.		a 18		30	22	15	73	.2	16	3
20.				30	18	16	27	.1	21	6
21.				28	16	18	21	0	18	8
22.				34	15	15	18	.2	16	8
23.				30	18	15	13	.2	15	8
24.				26	34	15	13	6	10	11
25.				24	49	16	13	9	6	11
26.				26	44	24	84	13	4	35
27.				21	47	30	30	6	1,200	17
28.				18	51	34	33	4	21	9
29.				16	44	34	30	206	21	6
30.				15	44	30	18	84	21	3.
31.				15		21		44	21	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	62	15	28.5	1,750
April	51	15	22.5	1,340
May	41	15	24.1	1,480
June	84	6	26.0	1,550
July	206	0	14.8	910
August	1,200	4	87.2	5,360
September	35	1	8.5	506
The period				12,900

a Result of discharge measurement.

## NORTH FORK OF ARIKAREE RIVER AT COLORADO-NEBRASKA LINE

LOCATION.—Staff gage in sec. 10, T. 1 N., R. 42 W., 100 feet east of Colorado-Nebraska line.

DRAINAGE AREA.—395 square miles.

RECORDS AVAILABLE.—March 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 378 second-feet July 30 (gage height, 3.5 feet); no flow Aug. 25, 26.

1931-32: Maximum discharge, that of July 30, 1932; no flow Aug. 25, 26, 1932.

REMARKS.—Records good except those for Nov. 19 to Mar. 15, which were based on two discharge measurements and temperature records. Small diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	21	36	-----	110	94	78	24	8	105	78
2.....	24	37	-----	110	94	76	1 <sup>9</sup>	8	99	43
3.....	25	37	-----	110	91	73	9	8	88	39
4.....	27	37	-----	113	86	62	22	8	65	39
5.....	22	39	-----	110	83	36	5 <sup>9</sup>	8	36	32
6.....	21	37	-----	110	78	32	3 <sup>9</sup>	7	52	22
7.....	29	37	-----	116	88	36	20	5	47	20
8.....	34	41	-----	100	60	37	22	5	36	17
9.....	32	39	-----	90	69	39	20	7	34	16
10.....	32	39	-----	90	74	41	12	7	29	16
11.....	30	43	-----	100	81	39	13	7	25	21
12.....	25	43	-----	100	83	27	1 <sup>9</sup>	5	25	20
13.....	16	47	-----	110	83	20	21	5	255	20
14.....	8	54	-----	120	81	16	1 <sup>9</sup>	6	192	22
15.....	9	56	* 81	127	72	19	12	6	86	16
16.....	18	72	-----	118	43	17	12	6	43	17
17.....	22	72	-----	127	37	14	1 <sup>9</sup>	5	39	21
18.....	36	69	-----	121	41	9	74	6	52	37
19.....	39	59	-----	113	16	10	94	7	36	39
20.....	50	56	-----	107	10	9	69	6	32	36
21.....	56	60	-----	105	10	9	32	6	47	22
22.....	47		-----	105	9	8	29	198	39	18
23.....	45		-----	105	11	8	17	14	39	27
24.....	39		-----	105	34	8	1 <sup>9</sup>	74	25	36
25.....	39		-----	99	78	10	1 <sup>9</sup>	20	0	32
26.....	37		-----	99	67	10	1 <sup>9</sup>	12	0	116
27.....	36		-----	99	60	18	1 <sup>9</sup>	10	107	88
28.....	36		-----	99	116	29	17	9	74	78
29.....	36		-----	96	107	56	11	20	65	65
30.....	43		-----	88	69	83	1 <sup>9</sup>	348	47	47
31.....	47	-----	-----	94	-----	47	-----	264	41	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	56	8	31.6	1,940
November.....	72	36	51.7	3,080
December.....	-----	-----	75	4,610
January.....	-----	-----	80	4,920
February.....	-----	-----	85	4,890
March.....	127	88	106	6,520
April.....	116	9	64.2	3,820
May.....	83	8	31.5	1,940
June.....	94	9	24.9	1,480
July.....	348	5	35.6	2,190
August.....	255	0	60.0	3,690
September.....	116	16	36.7	2,180
The year.....	348	0	56.9	41,300

\* Result of discharge measurement.

## 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 to September 1932.

REMARKS.—Records good. Discharge estimated Aug. 3-5. Diversions for irrigation above station.

*Discharge, in second-feet, 1932*

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1		40	28	11		20	28	21		24	26
2		36	28	12		18	29	22		25	26
3		30	28	13		27	30	23		22	24
4		25	28	14		28	25	24		19	23
5		17	29	15		27	25	25		19	26
6		22	30	16		25	23	26		20	36
7		20	28	17		25	23	27		32	32
8		20	25	18		25	23	28	38	32	31
9		19	27	19		30	30	29	58	29	32
10		20	27	20		28	27	30	77	28	32
								31	58	28	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
August	40	17	25.2	1,550
September	36	23	27.6	1,640
The period				3,190

## 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. Prior to Apr. 19 staff gage at same location was used.

DRAINAGE AREA.—1,420 square miles.

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 567 second-feet July 31 (gage height, 5.86 feet); minimum, 55 second-feet July 13 (gage height, 1.06 feet).

1929-32: Maximum discharge, 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 Jan. 16-19, Jan. 31 to Feb. 8, Mar. 9-14. Diversions for irrigation above station.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	86	87	88	72	105	130	89	103	95	87	151	73
2.....	90	87	93	77	108	129	92	103	124	95	171	73
3.....	87	82	97	91	110	124	91	100	103	127	160	72
4.....	86	91	89	129	110	118	92	100	115	109	137	72
5.....	87	88	88	116	114	114	91	103	119	87	126	71
6.....	81	89	88	110	120	111	93	102	111	75	119	71
7.....	84	89	89	114	124	103	91	101	106	70	116	71
8.....	81	87	88	124	130	100	93	98	99	75	104	71
9.....	85	87	87	107	134	103	93	97	102	75	91	71
10.....	83	84	91	108	132	105	93	95	95	69	75	70
11.....	86	87	91	110	132	110	93	95	102	67	83	69
12.....	92	91	89	106	131	115	91	95	99	67	79	68
13.....	87	86	92	111	131	120	95	93	99	61	81	68
14.....	91	88	87	108	130	122	90	94	98	63	79	73
15.....	92	89	85	105	128	127	87	92	95	67	127	84
16.....	91	91	96	106	134	119	89	91	119	63	121	83
17.....	92	84	97	110	140	121	86	90	136	67	93	83
18.....	89	89	99	112	129	127	91	86	123	75	92	82
19.....	90	87	101	116	131	100	96	81	167	68	88	77
20.....	86	89	98	118	128	94	98	80	157	65	87	85
21.....	92	87	88	116	133	97	97	81	126	67	86	87
22.....	91	81	89	113	135	100	96	77	152	77	84	88
23.....	87	83	97	114	132	98	97	79	112	99	83	87
24.....	83	89	93	116	135	102	114	80	100	86	81	87
25.....	87	87	91	114	135	95	107	75	106	83	80	87
26.....	90	105	97	121	137	95	103	87	106	80	79	92
27.....	79	104	94	122	139	92	101	78	102	78	78	91
28.....	87	93	91	122	137	93	108	85	101	77	76	94
29.....	86	92	89	116	135	94	109	87	94	76	75	98
30.....	91	89	95	115	-----	89	103	88	91	109	75	98
31.....	89	-----	97	100	-----	80	-----	99	-----	288	74	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	92	79	87.4	5,370
November.....	105	81	88.7	5,280
December.....	101	85	92.1	5,660
January.....	129	72	110	6,760
February.....	140	105	128	7,360
March.....	130	80	107	6,580
April.....	114	86	95.6	5,690
May.....	103	75	90.8	5,580
June.....	167	91	111	6,600
July.....	288	61	85.5	5,260
August.....	171	74	98.4	6,050
September.....	98	68	79.9	4,750
The year.....	288	61	97.8	70,900



## 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.—March 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 408 second-feet July 31, Aug. 1 (gage height, 3.00 feet); minimum, 9 second-feet Sept. 9, 10 (gage height, 1.00 foot).

1931-32: Maximum discharge, 420 second-feet Aug. 10, 1931 (gage height, 3.9 feet); minimum, that of 1932.

REMARKS.—Records fair. Discharge estimated Nov. 1 to Mar. 2, Mar. 9-14. Diversions for irrigation above station.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	48			200	140	160	110	64	333	16
2.	48			200	140	160	135	45	186	12
3.	48			205	140	160	124	43	144	10
4.	48			218	160	140	123	46	135	10
5.	48			205	160	140	164	56	102	16
6.	61			205	160	140	140	44	81	14
7.	61			205	171	140	130	48	75	13
8.	61			205	160	140	128	43	65	10
9.	61			190	160	140	126	26	57	9
10.	61			190	171	115	126	21	44	9
11.	104			200	182	107	126	20	40	14
12.	58			200	182	99	126	20	48	14
13.	58			210	160	91	113	33	38	17
14.	58		a 170	220	160	91	110	28	37	16
15.	58			231	160	75	92	28	37	15
16.	58			244	150	75	78	33	40	16
17.	58			218	115	68	133	32	77	16
18.	58			231	150	48	120	32	48	17
19.	58			231	150	48	393	30	40	16
20.	58	a 146		218	131	42	226	26	36	17
21.	56			205	107	36	198	35	31	21
22.	56			205	107	33	144	77	28	21
23.	60			205	99	33	144	28	26	22
24.	60			205	115	33	144	34	25	23
25.	56			205	123	34	126	42	24	26
26.	60			205	107	36	120	39	21	34
27.	133			182	115	35	130	37	21	34
28.	133			182	182	39	116	37	23	39
29.	133			182	171	53	91	46	23	39
30.	133			193	171	71	75	57	19	39
31.	133			182	---	88	---	276	17	---

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.	133	48	70.5	4,330
November.			145	8,630
December.			150	9,220
January.			155	9,530
February.			170	9,780
March.	244	182	206	12,700
April.	182	99	147	8,750
May.	160	33	86.1	5,290
June.	393	75	137	8,150
July.	276	20	46.0	2,830
August.	333	17	62.0	3,810
September.	39	9	19.2	1,140
The year.	393	9	117	84,200

a Result of discharge measurements.

## SAPPA CREEK NEAR OBERLIN, KANS.

LOCATION.—Staff gage in NW¼ sec. 6, T. 3 S., R. 29 W., 1½ miles east of Oberlin.

DRAINAGE AREA.—1,050 square miles.

RECORDS AVAILABLE.—March 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 138 second-feet June 5 (gage height, 4.70 feet); minimum, 1 second-foot several days in October, May, and June.

1929-32: Maximum discharge, 1,380 second-feet June 19, 1930 (gage height, 15.8 feet); minimum, 0.1 second-foot during 1929 and 1930. Bank-full stage, 8.0 feet.

REMARKS.—Records fair. Discharge estimated for periods of ice effect Nov. 22-28, Dec. 14-16, Jan. 4 to Feb. 7, Mar. 5-22.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	2	2	6	7		4	4	6	1
2.....	2	2	4	7		4	4	5	1
3.....	2	2	4	7		4	4	5	1
4.....	2	3	4	6		4	4	4	1
5.....	2	3	4		5		4	4	75
6.....	2	3	5				4	3	23
7.....	2	3	5	5		3	4	2	15
8.....	2	3	5		23		4	3	8
9.....	2	3	6		42		4	3	8
10.....	2	4	5		48		5	3	6
11.....	2	4	5		39		5	3	5
12.....	2	4	5		34		4	3	3
13.....	2	4	7		28		4	3	3
14.....	2	4			26		4	2	4
15.....	3	4			24		4	2	5
16.....	3	7		3	32		4	2	4
17.....	2	6	7		45	3	5	2	3
18.....	2	5	5		71		5	2	3
19.....	2	5	5		45		6	1	2
20.....	2	6	6		32		5	1	2
21.....	2	7	6		18		5	1	2
22.....	2		6		10		4	1	2
23.....	2		6		9	4	7	1	2
24.....	1		5		8	4	7	1	1
25.....	1	8	5		8	4	8	1	1
26.....	1		8	4	6	4	9	63	12
27.....	2		7		6	4	10	24	10
28.....	2		6		5	4	14	14	8
29.....	2	2	6		5	4	8	3	5
30.....	2	7	6			4	7	2	3
31.....	2		6			4		1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3	1	2.0	121
November.....		2	5.2	309
December.....	8	4	5.7	349
January.....	7		4.2	260
February.....	71		20.7	1,190
March.....	4		3.4	210
April.....	14	4	5.5	329
May.....	63	1	5.5	339
June.....	75	1	7.3	434
The period.....				3,540

## BEAVER CREEK AT LUDELL, KANS.

LOCATION.—Staff gage in SW $\frac{1}{4}$  sec. 30, T. 2 S., R. 32 W., on Chicago, Burlington & Quincy Railroad bridge at Ludell, 6 miles below mouth of Little Beaver Creek.

DRAINAGE AREA.—1,460 square miles.

RECORDS AVAILABLE.—March 1929 to June 1932.

EXTREMES.—Maximum discharge during period October to June, 134 second-feet May 26 (gage height, 7.46 feet); minimum, about 0.1 second-foot during October and November.

1929-32: Maximum gage height, 15.0 feet Sept. 8, 1930 (discharge not determined); minimum discharge, 0.1 second-foot during September and November 1931.

REMARKS.—Records fair. Stage-discharge relation affected by ice Nov. 20 to Dec. 13, Jan. 11 to Feb. 8.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0.2		0.4		2	3	7	6
2		.2		.4		2	3	7	6
3		.2		.4		2	3	6	5
4		.2		.5		2	3	6	4
5		.2		.5	0.5	2	3	6	39
6				.5		2	3	6	61
7		.2	0.2	.4		2	4	6	22
8		.2		.4		2	3	6	10
9		.2		.5	1	2	3	5	41
10		.2		.5	1	2	3	5	112
11		.3			.7	2	4	5	43
12		.2			1	2	4	5	18
13		.2			1	2	4	4	14
14		.2	.3		.8	2	4	4	11
15		.2	.3		1	3	4	4	10
16	0.1	.2	.3	.4	2	4	4	4	9
17		.2	.3		2	4	4	3	9
18		.2	.3		2	3	4	3	8
19		.2	.3		2	3	4	3	8
20			.3		2	2	4	3	8
21			.3		3	2	4	2	8
22			.4		4	2	4	2	7
23			.4		6	2	4	2	7
24			.3		4	3	4	2	6
25		.1	.3	.3	2	4	4	33	45
26			.3		4	4	5	130	15
27			.3		3	4	5	33	9
28			.4		2	4	8	16	6
29			.4		2	4	9	12	6
30			.4			3	8	8	6
31			.3			3		7	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October			0.10	6
November	0.3		.16	10
December	.4		.27	17
January	.5		.38	23
February	6		1.74	100
March	4	2	2.6	163
April	9	3	4.2	250
May	130	2	11.1	684
June	112	4	18.6	1,110
The period				2,360

**PRAIRIE DOG CREEK NEAR WOODRUFF, KANS.**

**LOCATION.**—Chain gage in NW¼ sec. 9, T. 1 S., R. 19 W., 3 miles west of Woodruff.

DRAINAGE AREA.—900 square miles.

**RECORDS AVAILABLE.**—March 1929 to June 1932 (discontinued).

**EXTREMES.**—Maximum discharge during period October to June, 1,400 second-feet Feb. 21 (gage height, 16.07 feet); minimum, 4 second-feet Oct. 29 (gage height, 1.96 feet).

1929-32: Maximum discharge, 2,830 second-feet July 25, 1929 (gage height, 25.02 feet); minimum, 4 second-feet in 1929 and 1931. Bank-full stage, 16 feet.

REMARKS.—Records good except those estimated for periods of ice effect, Jan. 10 to Feb. 12, Mar. 5-15, and those for October, November, and June, which are fair.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Ma <sup>r</sup> .	Apr.	May	June
1.-----	17	5	7	11	9	32	16	14	16
2.-----	16	4	7	9		30	15	14	54
3.-----	16	4	7	9		28	15	14	12
4.-----	16	5	8	10		26	15	14	146
5.-----	15	5	7	9		15	15	15	194
6.-----	15	5	7	9		13	14	15	238
7.-----	15	5	7	9			14	14	98
8.-----	15	5	7	9			13	14	64
9.-----	14	6	8	9			14	13	48
10.-----	14	6	8	6			15	15	12
11.-----	14	6	9		300		15	12	98
12.-----	57	6	10		800		15	12	28
13.-----	104	6	7		608		15	11	18
14.-----	18	6	7		390		15	11	15
15.-----	10	6	7		254		15	10	14
16.-----	7	7	8		5	194	28	14	9
17.-----	6	6	8			146	32	14	9
18.-----	5	6	8			67	36	14	9
19.-----	5	7	8			194	26	15	9
20.-----	5	12	8	230		22	15	8	
21.-----	5	116	9	1,220		20	15	8	
22.-----	4	22	10	1,220		20	15	8	
23.-----	5	13	11	483		20	15	7	
24.-----	5	8	12	194		20	15	6	
25.-----	5	8	13	122		20	14	6	
26.-----	5	8	10	8	58	19	14	159	
27.-----	5	8	24		40	19	14	238	
28.-----	4	9	9		38	18	15	110	
29.-----	4	8	9		32	18	15	38	
30.-----	5	8	10		-----	16	15	538	
31.-----	5	10				16	110		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	104	4	14.1	865
November-----	116	4	10.9	647
December-----	24	7	9.0	551
January-----	11	-----	7.5	462
February-----	1,220	-----	230	13,300
March-----	36	-----	20.4	1,250
April-----	16	13	14.7	873
May-----	538	6	47.3	2,910
June-----	238	7	55.3	3,290
The period-----	-----	-----	-----	24,100

## SMOKY HILL RIVER AT JEROME, KANS.

LOCATION.—Staff gage in NW¼ sec. 23, T. 15 S., R. 29 W., half a mile south of Jerome, Gove County, and 5 miles above Plum Creek.

DRAINAGE AREA.—3,900 square miles.

RECORDS AVAILABLE.—August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 313 second-feet June 6 (gage height, 3.78 feet); minimum, about 0.2 second-foot Oct. 7, 11 (gage height, 1.48 feet).

1928-32: Maximum discharge, 5,500 second-feet June 4, 1930 (gage height, 9.9 feet); minimum, 0.2 second-foot several days in September and October 1931. Bank-full stage, 8 feet.

REMARKS.—Records good except those estimated for period of ice effect, Jan. 6 to Feb. 20, Mar. 8-16, which are fair.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June		
1.-----	0.3	0.7	1	3	8	3	4	11	2		
2.-----	.2	.7	1	3		3	3	9	2		
3.-----	.2	.7	2	2		4	3	7	2		
4.-----	.2	.8	1	3		2	3	8	3		
5.-----	.2	.8	1	1		2	3	7	42		
6.-----	.2	1	3	1	17	2	4	9	313		
7.-----	.2	1	2			2	4	11	106		
8.-----	.2	1	5			4	13	72			
9.-----	.2	.8	8			3	11	54			
10.-----	.2	.8	7			4	7	42			
11.-----	.2	.8	6	4		7	4	4	4	40	
12.-----	2	.8	5				3	4	4	42	
13.-----	2	1	5				3	4	23		
14.-----	.8	1	5				3	3	19		
15.-----	.7	1	5				3	4	15		
16.-----	.5	1	4	4			28	3	4	12	
17.-----	.5	1	5					5	3	5	11
18.-----	.4	1	5					5	3	9	
19.-----	.4	1	4					4	5	3	141
20.-----	.4	2	7		19			4	3	75	
21.-----	.5	2	7	7	2			3	3	45	
22.-----	.5	2	7		5			3	3	21	
23.-----	.4	1	6		5			4	2	15	
24.-----	.5	1	5		5			5	2	16	
25.-----	.4	1	6		4	5		6	2	15	
26.-----	.4	1	6	7	4	5		6	2	106	
27.-----	.4	2	5		3	5		6	2	69	
28.-----	.4	3	5		3	5		27	2	40	
29.-----	.4	2	5		3	4		13	2	37	
30.-----	.4	2	5		4	4	13	2	25		
31.-----	.2	3	3	4		2	2	2			
Month				Maximum	Minimum	Mean	R m-off in acre-feet				
October.....				2	0.2	0.47	28.8				
November.....				3	.7	1.20	71.2				
December.....				8	1	4.6	282				
January.....						3.8	236				
February.....				28	3	9.8	565				
March.....				6	2	3.6	224				
April.....				27	3	5.2	309				
May.....				13	2	5.0	305				
June.....				313	2	47.1	2,800				
The period.....							4,830				

• Estimated.

## SMOKY HILL RIVER AT PFEIFER, KANS.

LOCATION.—Chain gage in SW¼ sec. 6, T. 15 S., R. 16 W., on highway bridge 1 mile east of Pfeifer.

DRAINAGE AREA.—6,070 square miles.

RECORDS AVAILABLE.—March 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 2,750 second-feet June 27 (gage height, 7.23 feet); minimum, 2 second-feet Jan. 27–31.

1929–32: Maximum discharge, 6,750 second-feet May 11, 1929 (gage height, 11.24 feet); minimum not determined.

REMARKS.—Records fair. Discharge estimated for period of ice effect, Jan. 8 to Feb. 14, and for May 10, 11.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	5	20	11		23	18	19	19
2	17	11	8	12		23	16	21	20
3	11	8	34	12		30	19	20	19
4	11	11	37	11		25	20	19	19
5	6	14	59	12		28	18	18	54
6		8	37	13	3	25	15	16	74
7	6	11	14	12		30	18	16	84
8	4	5	11			25	18	16	92
9	4	8	11			28	17	18	95
10	4	5	17			25	21	18	103
11	5	5	17	10		21	19	19	103
12	11	8	17		25	15	20	19	67
13	14	11	14		30	18	18	18	54
14	11	11	14		20	19	16	19	52
15	11	8	9		15	23	16	18	46
16	10	11	13		17	28	15	19	42
17	6	5	14		13	30	16	16	36
18	10	11	16		25	25	15	16	34
19	12	11	14	6	38	18	33	14	99
20	10	17	14		44	25	38	10	111
21	14	17	14		33	23	29	14	138
22	14	14	12		28	30	20	14	121
23	14	20	14		35	33	19	14	105
24	11	23	14	5	30	35	18	14	90
25	5	20	12		25	25	20	14	90
26	11	17	14		28	28	16	18	92
27	11	11	14		25	28	17	20	2,750
28	11	14	12		25	25	16	88	685
29	11	17	12	2	28	19	18	36	381
30	14	20	12			18	19	31	103
31	8		12			18		29	
Month	Maximum			Minimum			Mean		Run-off in acre-feet
October	17			4			9.8		603
November	23			5			11.9		708
December	59			8			17.2		1,060
January	13						7.5		464
February	44						17.8		1,030
March	35			15			24.7		1,520
April	38			15			19.3		1,150
May	88			10			20.7		1,270
June	2,750			19			193		11,500
The period									19,300

## 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 September 1925; August 1928 to September 1932.

**EXTREMES.**—Maximum discharge during year, 8,470 second-feet Sept. 12 (gage height, 15.46 feet); minimum, 12 second-foot Oct. 2 (gage height, 1.61 feet).

1895-1905; 1918-25; 1928-32: Maximum discharge, 21,000 second-feet July 5, 1895; minimum, 1.6 second-feet Oct. 8, 9, 1922. Bank-full stage, 20 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, Jan. 7-9, 14-19, Jan. 28 to Feb. 5, Feb. 10-15, and those for December, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	19	36	31		62	50	34	52	540	76	908
2	14	18	37	28		57	47	37	52	347	102	252
3	17	20	27	28	18	53	46	45	71	295	82	158
4	17	19	21	22		50	41	308	50	246	109	116
5	29	19	33	20		39	40	136	46	3,580	102	102
6	22	19	33	26	17	23	39	90	136	757	88	88
7	18	21	31		18	23	36	69	136	453	76	82
8	22	21	33	26	20	39	32	53	78	1,140	70	76
9	20	21	38		20	53	34	51	100	547	66	77
10	18	21	36	26		40	37	45	136	423	69	65
11	16	23	33	24		48	37	41	258	339	63	2,500
12	15	23	29	28	30	45	33	46	295	264	60	7,990
13	22	24	27	29		36	36	56	193	278	60	7,630
14	20	31	29			72	34	53	183	188	95	4,980
15	21	48	26			64	33	46	154	158	95	1,840
16	24	31	40	28	65	72	33	41	110	140	95	1,020
17	24	30	31		92	62	32	39	94	132	88	647
18	24	29	33		100	60	34	38	82	116	76	483
19	26	29	33		94	65	53	34	193	109	68	365
20	24	33	38	30	82	57	48	28	540	109	63	288
21	24	33	36	41	84	51	50	25	282	95	58	240
22	24	34	38	39	79	50	48	26	193	95	56	218
23	22	104	30	41	84	61	53	27	224	88	52	198
24	22	31	29	39	79	61	48	34	295	88	50	168
25	25	40	28	40	73	60	46	32	235	168	49	158
26	27	41	30	28	71	55	44	52	224	116	47	140
27	17	42	30	18	68	62	39	78	258	88	49	757
28	18	40	31		68	65	39	110	1,100	95	51	440
29	16	39	31		62	64	38	85	1,980	88	48	124
30	16	32	31	20		58	33	57	794	88	47	116
31	17		31			52		71		82	5,520	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	29	14	20.6	1,270
November	104	18	31.2	1,850
December	40	21	31.9	1,960
January	41	18	27.9	1,710
February	100		49.9	2,870
March	72	23	53.5	3,290
April	53	32	40.4	2,410
May	308	25	60.9	3,740
June	1,980	46	285	16,900
July	3,580	82	361	22,200
August	5,520	47	246	15,100
September	7,990	65	1,070	63,900
The year	7,990	14	189	137,030

## SMOXY HILL RIVER AT LINDSBORG, KANS.

LOCATION.—Chain gage in NE¼ sec. 20, T. 17 S., R. 3 W., on highway bridge at Lindsburg.

DRAINAGE AREA.—8,100 square miles.

RECORDS AVAILABLE.—February 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 4,530 second-feet Sept. 15 (gage height, 21.5 feet); minimum, 26 second-feet during October and January (gage height, 3.3 feet).

1930-32: Maximum discharge, 5,390 second-feet June 7, 1930 (gage height, 23.6 feet); minimum, 22 second-feet Sept. 20, 30, 1931 (gage height, 3.2 feet). Maximum stage known, 31.5 feet in May 1903.

REMARKS.—Records good except those for July to September, which are fair.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	26	30	52	52	30	117	66	52	8	805	98	52
2.....	30	30	52	52	30	117	66	52	5	512	117	2,450
3.....	30	30	52	46	30	117	66	52	8	391	127	450
4.....	30	30	52	46	30	107	66	52	70	350	98	236
5.....	26	30	52	40	30	107	66	52	15	1,060	89	190
6.....	26	30	46	40	30	107	66	201	10	3,660	89	147
7.....	26	30	46	35	30	81	66	157	13	1,490	98	127
8.....	26	30	46	35	30	73	66	127	9	576	107	117
9.....	26	30	46	26	30	66	66	98	117	1,210	117	98
10.....	26	30	46	26	30	52	59	81	9	592	107	89
11.....	26	30	46	30	30	46	52	66	8	496	98	89
12.....	26	30	46	26	30	46	59	52	117	405	98	89
13.....	26	35	46	26	35	46	59	52	127	350	98	2,920
14.....	26	46	46	26	35	46	52	46	22	285	81	3,950
15.....	30	46	46	26	35	46	52	52	15	260	73	4,530
16.....	30	46	46	30	40	66	52	52	147	236	73	4,400
17.....	30	46	46	30	46	59	52	52	127	201	66	1,130
18.....	30	46	46	30	52	66	52	46	117	179	66	839
19.....	30	46	46	30	66	73	52	46	179	157	81	147
20.....	30	46	46	30	73	73	59	46	3,110	137	89	465
21.....	30	46	52	30	73	73	59	40	62	137	81	435
22.....	30	46	52	30	81	73	59	35	435	127	81	405
23.....	30	59	52	30	89	73	59	35	298	127	73	377
24.....	30	59	52	30	89	73	59	35	260	117	73	350
25.....	30	52	52	30	98	73	59	35	435	127	66	311
26.....	30	52	52	30	107	73	59	59	285	127	59	272
27.....	30	52	52	30	107	73	59	52	1,550	127	52	248
28.....	30	52	52	30	117	73	59	52	856	147	52	391
29.....	30	52	52	30	117	73	59	98	337	137	46	298
30.....	30	52	52	30	-----	73	52	73	1,560	117	46	260
31.....	30	-----	52	30	-----	73	-----	81	-----	117	46	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	30	26	28.6	1,760
November.....	59	30	41.3	2,460
December.....	52	46	49.1	3,020
January.....	52	26	32.6	3,010
February.....	117	30	55.9	3,210
March.....	117	46	74.6	4,590
April.....	66	52	59.5	3,540
May.....	201	35	65.5	4,020
June.....	3,110	59	422	25,100
July.....	3,660	117	476	29,300
August.....	127	46	82.1	5,050
September.....	4,530	52	862	51,300
The year.....	4,530	26	186	135,000



## SMOKY HILL RIVER NEAR MENTOR, KANS.

LOCATION.—Chain gage in SE¼ sec. 18, T. 15 S., R. 2 W., 1½ miles east of Mentor and 26 miles above Saline River.

DRAINAGE AREA.—8,210 square miles.

RECORDS AVAILABLE.—December 1923 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 2,450 second-feet June 20 (gage height, 17.1 feet); minimum, 37 second-feet in October and November (gage height, 3.1 feet).

1923-32: Maximum discharge, 7,450 second-feet Aug. 17, 1927 (gage height, 25.8 feet); minimum discharge, 12 second-feet in August 1926. Bank-full stage, 20 feet.

REMARKS.—Records good except those for December to March and May, which are fair. State-discharge relation affected by ice Jan. 6 to Feb. 13.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	37	37	65	58		101	93	72	93
2.....	37	37	58	58		101	86	72	86
3.....	37	37	58	58		101	86	72	93
4.....	44	37	58	58		93	79	72	1,400
5.....	37	27	58	58		93	79	65	411
6.....	37	37	58	58	35	93	79	65	182
7.....	37	37	58			79	79	200	133
8.....	37	37	58			65	79	165	141
9.....	37	37	58			58	72	149	133
10.....	37	44	58			51	72	149	149
11.....	37	44	58			44	65	79	117
12.....	37	44	58		40	51	65	79	101
13.....	37	44	58		50	51	65	72	133
14.....	37	44	58		72	51	65	65	227
15.....	37	58	58		72	65	65		246
16.....	37	58	51		72	86	65	65	182
17.....	37	58	51		79	101	65	65	165
18.....	37	58	51		79	101	65	65	157
19.....	37	58	51	35	86	101	72	58	371
20.....	37	58	58		93	93	79	58	1,680
21.....	37	58	65		101	93	79	58	1,640
22.....	37	58	58		101	93	79	51	607
23.....	37	65	58		101	93	86	51	425
24.....	44	65	58		101	93	86	51	320
25.....	44	65	58		101	93	79	51	425
26.....	44	58	58		101	93	79	58	384
27.....	44	65	58		93	93	79	65	320
28.....	44	65	58		101	93	79	72	1,550
29.....	44	65	58		101	93	79	79	500
30.....	37	65	58			93	79	79	485
31.....	37		58			93		93	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	44	37	38.6	2,370
November.....	65	37	51.0	3,030
December.....	65	51	57.5	3,640
January.....	58		39.5	2,430
February.....	101		66.5	3,330
March.....	101	44	83.9	5,160
April.....	93	65	76.0	4,520
May.....	200	51	79.4	4,880
June.....	1,680	86	429	25,500
The period.....				55,300

## 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 1932.

EXTREMES.—Maximum discharge during year, 11,300 second-feet July 9 (gage height, 22.2 feet); minimum, 137 second-feet on Nov. 1, 8, Feb. 11 (gage height, 3.3 feet).

1904; 1922-32: Maximum discharge, 18,400 second-feet Aug. 10, 1928 (gage height, 28.0 feet); minimum discharge, 25 second-feet Oct. 14, 1925. Bank-full stage, 24.0 feet.

Maximum stage known, about 35.0 feet during flood of 1903.

REMARKS.—Records good except those for periods of ice effect, Jan. 6-22, Jan. 27 to Feb. 10, Mar. 7-14, and those for June to September, which are fair.

Gage-height record furnished by United States Weather Bureau.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	180	137	295	247		736	345	295	270	952	395	986
2	224	158	270	247		736	295	247	224	2,490	445	5,270
3	270	180	320	247		763	320	202	470	1,970	574	7,010
4	202	180	320	295		763	270	270	1,940	1,190	420	5,920
5	224	202	345	295		470	224	202	1,040	2,600	370	2,650
6	224	180	295		150	295	180	224	1,010	6,360	345	1,100
7	202	158	270				270	247	628	8,210	395	750
8	180	137	224				247	655	420	6,420	420	642
9	180	158	224				270	495	395	11,300	445	537
10	202	202	247				295	395	955	6,760	395	485
11	202	180	224	275	137	250	224	320	763	2,700	345	410
12	202	158	247		202		247	270	601	1,430	320	360
13	202	158	270		180		247	224	574	955	345	385
14	224	180	270		180		295	247	1,010	790	1,720	615
15	202	247	247		520	270	270	295	763	709	1,330	4,420
16	520	295	247		547	295	224	370	709	628	806	7,770
17	470	202	295		790	345	247	320	601	574	2,440	8,060
18	420	270	345		682	395	202	270	445	420	1,720	6,340
19	295	247	295	250	520	370	270	270	709	420	750	3,200
20	270	247	295		520	395	295	247	3,040	420	537	1,550
21	270	202	295		574	420	270	224	4,260	420	485	1,350
22	247	202	270		628	470	247	180	4,140	370	435	1,470
23	224	202	247	202	709	420	370	158	1,570	345	410	984
24	224	445	295	180	844	345	420	202	1,280	370	336	817
25	202	370	295	180	871	295	395	224	1,380	445	336	736
26	180	270	295	180	817	420	395	247	1,100	445	360	736
27	180	345	295		790	445	345	270	1,280	420	312	763
28	158	420	270	170	871	395	370	247	1,670	709	264	628
29	158	370	270		817	370	295	224	1,770	574	217	574
30	180	370	270	160		320	270	202	1,380	495	217	574
31	158		295	160		224		202		445	288	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	520	158	235	14,400
November	445	137	236	14,000
December	345	224	279	17,100
January	295		239	14,700
February	871		438	25,200
March	763	224	386	23,700
April	420	180	287	17,100
May	655	158	272	16,800
June	4,260	224	1,210	72,200
July	11,300	345	2,010	124,000
August	2,440	217	586	36,100
September	8,060	360	2,240	133,000
The year	11,300		700	508,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 2,300 second-feet Sept. 13 (gage height, 10.10 feet); minimum, 6 second-feet Feb. 14 (gage height, 2.73 feet).

1929-32: Maximum discharge, 4,140 second-feet Sept. 10, 1930 (gage height, 13.50 feet); minimum, 5 second-feet in January 1930. Bank-full stage, about 20 feet.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 4 to Feb. 13, Mar. 6-14.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	27	34	32		71		62	46	111	33	117
2	34	27	34	32		69		60	46	96	42	76
3	34	31	32	21		68		65	45	77	45	64
4	32	29	32	14		61		67	43	77	40	60
5	29	27	32	10	a 27	57		76	45	62	45	52
6	31	27	35					74	98	57	39	46
7	29	27	35					67	155	59	35	43
8	29	29	37				a 30	83	189	62	29	42
9	24	29	35					174	136	57	29	39
10	24	27	39	a 20	a 50			159	202	46	35	38
11	17	21	44					148	250	48	32	224
12	14	31	40	a 25				121	167	46	29	1,030
13	23	26	42					104	226	45	23	2,070
14	23	21	40		21			92	453	42	29	1,510
15	24	29	35		42	67		79	290	39	32	548
16	26	32	34		68	62		76	157	39	33	359
17	24	34	35		66	52	54	74	125	38	35	248
18	24	34	34		71	60	48	69	125	36	35	228
19	23	26	35		76	54	54	65	161	35	35	202
20	21	34	37		74	46	64	65	140	33	33	148
21	19	37	35	a 25	66	40	90	64	496	32	32	138
22	18	32	32		110	36	74	59	281	31	32	117
23	14	40	34		126	42	69	60	176	26	31	115
24	18	37	37		122	33	67	70	119	25	35	108
25	18	37	39		111	70	60	79	119	29	32	100
26	14	34	37		97	76	56	87	324	28	29	90
27	26	31	37		88	60	59	76	602	31	23	98
28	31	31	37	a 20	83	52	59	67	237	40	29	90
29	29	32	35		76	48	59	60	138	35	29	83
30	27	34	34			40	60	52	115	35	35	81
31	27		32			a 35		51		33	23	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	34	14	24.4	1,500
November	40	21	30.4	1,810
December	44	32	35.8	2,200
January	32	10	21.9	1,350
February	126		56.6	3,260
March	76		53.2	3,270
April	90		45.1	2,680
May	174	51	80.8	4,970
June	602	43	191	11,400
July	111	25	46.8	2,880
August	231	26	39.6	2,440
September	2,070	38	272	16,200
The year	2,070		74.3	53,900

a 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 1932.

EXTREMES.—Maximum discharge during year, 1,600 second-feet Sept. 2 (gage height, 17.90 feet); minimum, 7 second-feet Aug. 29 (gage height, 2.38 feet).

1919-32: Maximum discharge, 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.

REMARKS.—Records fair. Discharge estimated because of ice Jan. 7-15, Jan. 29 to Feb. 6. Discharge interpolated Mar. 9, June 26.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	45	46	56	25	80	68	52	56	184	23	1,060
2	32	44	48	52		76	64	48	64	147	45	1,400
3	36	44	48	42		76	56	48	68	117	34	465
4	45	40	46	42		80	60	52	45	112	42	156
5	42	42	45	44		76	56	56	56	135	46	90
6	39	44	42	44	29	68	60	56	56	1,420	56	72
7	40	44	44	44		68	60	56	56	525	44	56
8	40	40	42	42		29	56	45	56	60	142	28
9	42	39	42	42		34	54	45	60	95	90	38
10	44	36	46	46		44	52	48	80	129	80	20
11	39	40	46	35	46	46	46	56	149	72	19	56
12	38	38	48		52	42	48	135	123	72	23	40
13	39	40	46		60	42	46	117	173	60	29	615
14	42	40	46		68	42	48	111	177	52	34	1,150
15	44	68	45		68	46	52	100	149	56	25	1,510
16	44	68	42	52	80	48	48	85	225	45	46	1,510
17	48	60	46	45	46	48	45	80	375	52	40	686
18	48	60	45	44	52	76	45	72	198	52	45	338
19	40	60	40	38	60	80	68	68	165	45	39	249
20	46	60	52	33	68	85	56	64	177	48	21	201
21	52	60	48	30	72	85	48	68	226	46	22	170
22	48	56	40	34	85	80	60	56	226	42	24	156
23	45	56	40	38	85	76	64	60	274	42	22	185
24	39	48	44	34	90	80	76	56	337	46	22	129
25	38	45	45	32	105	72	76	60	191	30	20	123
26	48	52	48	33	105	68	64	60	166	45	18	117
27	38	56	48	30	105	72	64	68	141	48	21	111
28	40	52	48	30	95	76	64	80	205	30	19	105
29	44	60	46	20	85	80	60	80	498	36	15	105
30	44	60	64		80	48	68	68	337	34	21	105
31	45		56		76		68			24	76	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	52	32	42.2	2,590
November	68	36	49.9	2,970
December	64	40	46.2	2,840
January	56		36.4	2,240
February	105		59.1	3,400
March	85	42	67.3	4,140
April	76	45	56.3	3,350
May	135	48	69.5	4,280
June	498	45	174	10,300
July	1,420	24	127	7,790
August	76	15	31.5	1,940
September	1,510	40	370	22,000
The year	1,510	15	93.5	67,900

## SOUTH FORK OF SOLOMON RIVER AT ALTON, KANS.

LOCATION.—Chain gage in SW¼ sec. 12, T. 7 S., R. 15 W., three quarters of a mile south of Alton.

DRAINAGE AREA.—1,720 square miles.

RECORDS AVAILABLE.—August 1919 to June 1925; August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 1,040 second-feet June 6 (gage height, 7.16 feet); minimum, 19 second-feet June 4 (gage height, 2.23 feet).

1919-25, 1928-32: Maximum discharge, 9,340 second-feet Sept. 16, 1919 (gage height, 19.5 feet), minimum, 0.1 second-foot Sept. 7, 1922. Bank-full stage, 23 feet.

Maximum stage known, 24.5 feet Aug. 1, 1928.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 12 to Feb. 23, Mar. 5-12.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1. ....	13	21	30	23	} * 20	110	58	51	22
2. ....	12	21	34	21		110	58	51	21
3. ....	11	22	26	17		104	58	48	20
4. ....	11	23	30	18		104	58	44	19
5. ....	13	22	34	19			54	48	20
6. ....	14	21	37	20	} * 60		54	51	710
7. ....	15	22	39	19			51	51	158
8. ....	14	23	43	14			51	51	70
9. ....	15	25	47	15			54	51	66
10. ....	16	23	* 46	18			58	48	70
11. ....	* 20	26	46	19	} * 24		58	48	70
12. ....	* 40	27	40				54	34	70
13. ....	* 35	27	41			78	54	34	* 65
14. ....	30	30	48			78	51	33	* 60
15. ....	30	29	46			83	51	31	* 55
16. ....	28	27	42	} * 10	} * 24	83	48	30	48
17. ....	26	29	39			78	48	29	44
18. ....	26	32	37			74	48	29	44
19. ....	22	38	39			74	48	28	41
20. ....	19	44	39			70	48	27	38
21. ....	18	34	38	} * 14	70	70	44	26	36
22. ....	19	31	37		170	70	48	25	34
23. ....	19	28	37		200	74	48	24	31
24. ....	19	28	35		200	74	48	23	30
25. ....	22	28	33		174	74	44	* 23	* 30
26. ....	22	30	33	} * 14	166	70	44	* 22	29
27. ....	19	31	32		150	66	44	* 21	28
28. ....	19	33	31		129	66	48	21	28
29. ....	18	35	30		122	62	48	21	37
30. ....	17	37	26			62	48	22	36
31. ....	19		25			62		22	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October .....	40	11	20.0	1,230
November .....	44	21	28.2	1,680
December .....	48	25	36.8	2,260
January .....	23		14.4	887
February .....	200		62.8	3,610
March .....	110		73.4	4,510
April .....	58	44	50.9	3,030
May .....	51	21	34.4	2,120
June .....	710	19	67.7	4,030
The year .....				23,400

\* Estimated.

## 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 1932.

EXTREMES.—Maximum discharge during year, 5,320 second-feet Sept. 13 (gage height, 18.48 feet); minimum, 5 second-feet at times of low flow during which power plant is shut down.

1929-32: Maximum discharge, 11,900 second-feet June 8, 1929 (gage height, 26.40 feet); minimum, 5 second-feet 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, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	64	* 75	78	67	179	52	62	76	107	71	179
2	13	85		90	67	158	57	80	73	106	97	163
3	41	61		65	69	163	30	44	123	73	57	92
4	49	74		82	68	148	57	* 52	143	83	66	41
5	49	89	85	114	68	118	69	59	218	79	44	39
6	36	89	74	65	68	114	40	60	148	* 79	89	38
7	46	61	101	65	* 70	* 80	40	76	1,080	* 79	61	37
8	48	* 80	89	88			43	34	936	79	63	37
9	45		95	74			54	61	422	35	63	36
10	13		103	88			57	* 85	380	* 50	79	52
11	174	* 80	114	82	* 70	* 80	81		1,140		53	54
12	266		109	80			49		706		104	1,290
13	332		104	86			49	88	366		168	4,940
14	306	85	114	82	174	51	80	240	34	5	3,000	2,270
15	174	75	64	* 70	123	78	73	81	170	* 50	1,270	498
16	148	96	99	59	143	94	47	80	174	* 55	292	273
17	143	60	118	71	306	107	41	78	148	37	212	218
18	81	82	63	83	325	143	65	79	128	35	163	118
19	123	87	88	60	286	118	48	81	123	34	114	123
20	61	108	88	82	306	100	68	84	123	34	96	104
21	91	85	123	64	352	85	61	78	118	34	49	86
22	93	* 80	89	79	516	98	56	76	94	55	83	50
23	59	254	102	86	514	85	73	75	174	32	42	61
24	114	236	104	65	467	86	43	65	179	514	73	41
25	69	123	92	83	760	85	72	74	178	292	41	72
26	91	118	123	82	724	107	78	78	128	128	68	92
27	59	123	85	82	422	89	43	67	133	100	39	54
28	91	85	114	* 70	273	88	61	68	266		* 60	190
29	74	* 80	101	* 60	218	79	65	76	478			467
30	75	* 80	89	59	-----	78	57	74	236			224
31	68	-----	109	69	-----	61	-----	66	-----	-----	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	332	13	98.7	6,070
November	254	60	95.3	5,670
December	123	-----	94.8	5,830
January	114	59	76.2	4,690
February	760	67	255	14,700
March	179	61	100	6,150
April	81	30	56.0	3,330
May	88	34	72.0	4,430
June	1,140	73	288	17,100
July	514	5	87.9	5,400
August	3,000	-----	219	13,500
September	4,940	36	398	23,700
The year	4,940	5	152	111,000

\* 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 1932.

EXTREMES.—Maximum discharge during year, 6,800 second-feet Sept. 2 (gage height, 22.32 feet); minimum, 43 second-feet Nov. 16 (gage height, 2.70 feet).

1897-1903, 1919-32: Maximum discharge, 10,600 second-feet June 3, 1903; minimum, 1 second-foot Sept. 4, 1926. Bank-full stage, 22 feet.

REMARKS.—Records fair. Discharge estimated Jan. 29 to Feb. 1, Feb. 3-4.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	81	52	86	118	62	443	157	111	76	186	148	4,040
2	111	48	111	92	76	350	166	125	71	380	132	6,400
3	98	63	111	92	76	229	166	148	253	350	125	3,630
4	104	55	104	86	71	217	166	140	196	350	111	910
5	98	50	111	118	71	229	166	140	98	1,020	111	321
6	98	50	98	98	71	217	166	148	92	1,170	111	176
7	92	50	86	118	66	293	166	528	104	511	157	148
8	66	50	76	104	86	321	166	196	206	2,800	140	140
9	66	50	71	92	111	157	104	186	511	4,950	132	140
10	71	50	71	92	111	140	111	166	1,020	1,980	111	132
11	71	60	76	86	76	132	104	132	477	528	118	125
12	92	58	71	92	81	125	125	98	241	293	118	118
13	132	60	86	104	71	125	132	92	511	266	582	111
14	196	66	111	111	104	118	111	86	861	157	1,750	350
15	307	84	104	111	196	111	111	86	411	125	658	3,140
16	267	45	111	118	350	98	111	86	307	118	2,020	3,540
17	241	50	111	111	266	140	111	92	217	132	2,550	1,110
18	180	84	132	111	241	176	111	92	157	118	724	350
19	130	60	118	111	266	104	111	92	176	104	336	241
20	130	58	86	111	293	125	118	92	1,870	98	241	229
21	130	60	86	104	411	118	148	92	861	92	228	196
22	113	91	92	104	335	196	148	86	365	86	204	176
23	72	78	81	104	380	176	148	86	293	86	139	166
24	58	91	81	104	528	176	148	92	266	92	121	157
25	50	78	76	76	564	176	140	98	176	92	130	132
26	50	139	81	71	582	176	148	92	148	98	113	132
27	50	216	76	76	639	176	140	92	140	111	84	132
28	55	166	81	66	658	166	125	98	140	253	75	125
29	60	148	104	62	460	176	118	76	140	176	75	118
30	55	140	132	58	-----	157	125	76	132	166	75	118
31	52	-----	132	58	-----	176	-----	81	-----	176	280	-----

Month	Maximum	Minimum	Mean	Pun-off in acre-feet
October	307	50	109	6,700
November	216	45	78.3	4,660
December	132	71	95.3	5,860
January	118	58	95.5	5,870
February	658	62	252	14,500
March	443	98	184	11,300
April	166	104	136	8,070
May	528	76	123	7,550
June	1,870	71	351	20,900
July	4,950	86	550	33,800
August	2,550	75	384	23,600
September	6,400	111	893	53,200
The year	6,400	45	270	196,000

## NORTH FORK OF SOLOMON RIVER AT KIRWIN, KAN.

LOCATION.—Chain gage in SW $\frac{1}{4}$  sec. 34, T. 4 S., R. 16 W., half a mile south of Kirwin and three quarters of a mile below Bow Creek.

DRAINAGE AREA.—1,290 square miles.

RECORDS AVAILABLE.—August 1919 to June 1925; August 1928 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 1,140 second-foot June 5 (gage height, 8.02 feet); minimum, 2 second-foot Oct. 3, 6 (gage height, 1.92 feet).

1919-25, 1928-32: Maximum discharge (estimated), 15,500 second-foot Sept. 18, 1919 (gage height, 22.5 feet); minimum, 0.5 second-foot Dec. 5, 1922, Oct. 1, 5, 12, 19, 1924, July 20, 1929. Bank-full stage, 13 feet.

REMARKS.—Records fair. Discharge estimated for period of ice effect, Jan. 1 to Feb. 13, Mar. 4-13.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	18	21	23	18		46	36	33	19
2	3	24	20			46	33	30	23
3	2	24	21		15	46	33	30	28
4	6	24	20				33	30	28
5	4	30	26				33	30	585
6	2	24	28	17			33	30	290
7	6	33	28				33	30	110
8	6	19	24			35	33	30	89
9	3	25	21		20		33	30	257
10	3	26	23				28	33	152
11	27	23	28				30	40	80
12	16	25	30		30		28	36	60
13	24	19	20		150		28	24	63
14	46	33	23		89	38	28	30	46
15	36	28	21		56	36	30	30	36
16	30	24	24	15	49	40	30	30	28
17	27	23	21		56	40	30	26	33
18	26	28	24		60	38	30	24	30
19	26	33	28		67	38	33	22	33
20	22	43	26		171	38	33	23	30
21	21	33	24		257	46	33	23	30
22	21	28	24		134	43	30	26	30
23	33	26	26		84	43	30	26	28
24	30	28	28		171	38	30	25	28
25	22	24	24		84	38	30	27	30
26	33	28	26	10	67	36	30	30	43
27	23	30	24		56	36	30	27	184
28	21	33	28		52	36	30	28	110
29	23	30	27		52	36	33	30	46
30	23	22	25			36	30	27	36
31	23		20			38		27	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	46	2	19.5	1,200
November	43	19	27.0	1,610
December	30	20	24.4	1,500
January			13.9	855
February	257		64.8	3,730
March	46		38.1	2,340
April	36	28	31.1	1,850
May	40	22	28.6	1,760
June	585	19	86.2	5,130
The period				20,000



## BIG BLUE RIVER AT BARNSTON, NEBR

**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 to September 1932.

**EXTREMES.**—Maximum discharge during period, 7,210 second-feet June 4 (gage height, 16.23 feet); no flow frequently, when reservoir gates are closed (gage height, 1.78 feet).

**REMARKS.**—Records good. Low-water flow regulated by power plant at Barnston, which has pondage of about 1,500 acre-feet.

*Discharge, in second-feet, 1932*

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1.....		921	412	426	2,000	16.....	289	1,640	397	817	157
2.....		672	372	2,870	720	17.....	186	1,160	143	672	174
3.....		3,750	350	4,020	474	18.....	179	1,540	252	648	120
4.....		6,530	422	4,950	220	19.....	189	1,450	983	644	302
5.....		5,600	548	3,740	207	20.....	202	1,080	672	647	336
6.....		4,130	688	2,390	202	21.....	240	1,020	740	596	836
7.....		4,640	1,190	1,690	212	22.....	134	1,130	620	592	2,030
8.....		4,600	1,770	1,020	186	23.....	215	939	390	448	1,600
9.....		3,840	1,910	652	52	24.....	102	823	280	292	882
10.....		2,730	1,400	430	106	25.....	220	704	361	289	592
11.....		1,960	1,010	401	102	26.....	292	728	930	264	444
12.....		2,530	744	921	202	27.....	186	1,020	430	372	207
13.....		2,560	644	852	116	28.....	194	1,160	237	948	261
14.....	576	2,820	584	802	123	29.....	92	692	218	305	240
15.....	232	2,640	482	1,260	143	30.....	340	448	199	283	270
						31.....	948	-----	160	2,817	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 14-31.....	948	92	268	9,570
June.....	6,530	448	2,180	130,000
July.....	1,910	143	630	38,700
August.....	4,950	264	1,200	73,800
September.....	2,030	52	451	26,800
The period.....				279,000

## BIG BLUE RIVER AT HULL, KANS.

LOCATION.—Water-stage recorder in NW¼ sec. 3, T. 2 S., R. 7 E., a 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 1932.

EXTREMES.—Maximum discharge during year, 10,200 second-feet Nov. 24 (gage height, 17.99 feet); minimum, 38 second-feet Oct. 26 (gage height, 1.98 feet).

1919-25, 1928-32: Maximum discharge, 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.

Maximum stage known, 31.7 feet in May 1903.

REMARKS.—Records fair except those estimated, which are poor.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		167	678	672		2,470	428	217	1,020	476	622	2,770
2		73	508	412		2,410	412	236	1,170	444	2,080	910
3		98	380	341	300	1,970	280	214	3,020	412	3,480	622
4		113	338	300		1,610	255	194	6,900	460	5,040	347
5	400	72	314	323		1,340	335	202	5,760	573	4,400	244
6		90	300	258	428	1,160	306	317	3,890	739	2,300	303
7		83	220	412	540	980	241	250	4,550	945	1,560	326
8		98	241	540	1,450		285	228	4,630	1,520	1,120	303
9		71	182	875	1,230		212	283	3,680	1,920	639	124
10	291	115	263	540	1,480		186	306	2,770	1,480	320	109
11	2,300	115	556	590	3,410	600	252	460	1,890	1,120	258	158
12		392	910	428	3,820		323	524	2,140	858	1,300	320
13		380	824	428	2,710		199	508	2,360	722	841	212
14		283	556	476	1,300	460	162	428	2,530	639	500	162
15		428	263		824	606	186	300	2,570	524	1,230	184
16		444	320	500	841	508	212	350	1,760	476		184
17		678	341	573	1,160	622	277	222	1,270	167		209
18		739	300	573	1,560	656	236	196	1,370	231		247
19		756	285	556	1,920	656	294	172	1,490	841	750	269
20		492	206	656	1,560	524	217	196		807		392
21		94	255	300	1,090	1,450	622	236		756		875
22		172	428	263	807	2,410	540	338	184	722	590	2,770
23		172	2,770	231	606	2,770	508	274	172	492	428	1,660
24		72	9,700	206	524	1,920	672	308	196	428	297	1,020
25		72	5,040	300	492	1,340	910	165	160	412	263	
26		61	2,590	244	347	1,810	875	269	300		247	650
27		156	1,480	258	220	1,920	722	209	231	1,050	263	
28		139	1,090	192	317	1,920	590	255	214		945	
29		63	910	202	2,240	540	214	202	824	550	380	335
30		63	824	239		460	194	524	540		311	362
31		65	444			444		1,120			3,610	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October		61	739	45,500
November	9,700	71	1,030	61,000
December	910	182	350	21,500
January	1,090	220	487	30,000
February	3,820		1,500	86,300
March	2,470	444	853	52,500
April	428	162	259	15,400
May	1,120	160	301	18,500
June	6,900	540	2,220	133,000
July	1,920	167	709	43,600
August	5,040	247	1,210	74,400
September	2,770	109	601	35,700
The year	9,700	61	850	617,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 16,900 second-feet Nov. 25 (gage height, 17.70 feet); minimum, 285 second-feet Sept. 11 (gage height, 2.69 feet). 1918-32: Maximum discharge, 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.

Maximum stage known, 31.7 feet May 31, 1903.

REMARKS.—Records good except those estimated for periods of ice effect during January, February, and March, which are fair.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,090	292	1,820	1,160	650	4,460	903	660	2,560	903	560	10,000
2.....	903	311	1,520	1,900		4,360	845	610	1,720	790	610	5,200
3.....	963	311	1,090	963		4,040	790	610	3,650	790	3,050	1,940
4.....	845	408	1,020	736		3,300	790	710	8,020	684	4,460	1,180
5.....	790	349	963	790		2,790	634	610	9,120	1,590	5,510	760
6.....	684	368	845	586	1,100	2,300	586	660	6,460	2,400	4,150	585
7.....	736	349	903	586		1,900	736	660	5,620	2,060	2,850	510
8.....	563	349	790	634		1,520	684	820	7,450	2,590	2,100	510
9.....	517	349	634	600		4,360	684	880	7,560	2,660	1,510	488
10.....	429	330	736				684	820	5,720	2,660	1,060	465
11.....	5,510	349	790				586	820	3,940	1,940	760	332
12.....	8,500	429	1,220				540	760	4,250	1,510	820	332
13.....	6,140	349	1,740				684	820	3,940	1,180	2,660	385
14.....	4,360	517	1,520				586	880	3,720	1,000	1,860	445
15.....	2,990	684	1,090				586	820	3,830	880	1,860	385
16.....	1,740	684	903	790	1,740	1,290	540	660	3,720	760	2,460	385
17.....	1,170	790	790	790	2,690	1,360	586	610	2,490	660	1,580	425
18.....	845	963	790	684	3,200	1,440	586	610	2,790	610	1,240	405
19.....	684	963	684	790	3,620	1,440	684	510	2,220	610	1,060	445
20.....	517	1,020	736	1,590	3,940	1,440	790	510	2,300	2,380	1,000	368
21.....	429	790	684	3,520	3,200	1,160	1,090	488	1,820	1,310	940	560
22.....	494	1,980	684	3,410	3,410	1,220	820	465	1,590	1,000	880	5,200
23.....	472	3,720	790	1,670	5,930	1,090	820	488	1,670	1,000	760	4,670
24.....	450	14,200	684	1,160	5,400	1,160	880	465	1,590	820	760	2,380
25.....	450	16,000	634	1,020	3,830	1,740	820	465	1,360	760	660	1,510
26.....	408	7,340	586	963	3,200	2,060	710	488	1,160	880	488	1,060
27.....	292	4,040	684	963	4,560	1,740	710	465	1,090	1,440	510	760
28.....	368	2,690	586	790	4,880	1,360	820	610	1,900	880	488	660
29.....	429	1,980	634	600	4,460	1,160	710	610	2,060	610	510	465
30.....	388	1,900	563		1,020	710	760	1,360	610	510	510	535
31.....	330	-----	634		-----	903	-----	1,720	-----	610	488	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	8,500	292	1,430	88,200
November.....	16,000	292	2,160	129,000
December.....	1,820	563	895	55,000
January.....	3,520	-----	1,020	62,500
February.....	5,930	-----	2,870	165,000
March.....	4,460	903	1,750	107,000
April.....	1,090	540	720	42,800
May.....	1,720	465	679	41,800
June.....	9,120	1,090	3,560	212,000
July.....	2,660	560	1,240	76,400
August.....	5,510	488	1,550	95,500
September.....	10,000	332	1,440	86,000
The year.....	16,000	292	1,600	1,160,000

## LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.

LOCATION.—Water-stage recorder in sec. 5, T. 1 N., R. 3 E., 1½ miles southwest of Endicott.

DRAINAGE AREA.—2,590 square miles.

RECORDS AVAILABLE.—April 1929 to September 1932. At print several miles upstream May 1908 to September 1915.

EXTREMES.—Maximum discharge during year, 3,510 second-feet June 3 (gage height, 9.32 feet); minimum, 61 second-feet Sept. 28 (gage height, 0.06 foot). 1908-15, 1929-32: Maximum discharge, 13,700 second-feet June 6-7, 1908; minimum, 16 second-feet Sept. 28, 1931 (discharge measurement).

REMARKS.—Records good. Discharge estimated Jan. 11-16, Jan. 31 to Feb. 9, Mar. 9-13. No diversions. Diurnal fluctuations caused by operation of power dams above.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	188	114	199	155	130	851	188	158	161	128	124	215
2.....	207	120	188	148	140	682	184	150	821	113	142	144
3.....	211	119	188	136	150	558	175	155	2,980	109	128	126
4.....	179	119	182	144	149	474	172	155	1,490	168	305	120
5.....	155	120	173	145	110	422	170	145	1,040	660	318	113
6.....	147	123	173	113	140	358	168	152	855	492	217	112
7.....	139	126	172	124	180	292	168	292	625	209	168	110
8.....	138	126	165	130	150	188	165	289	862	240	138	112
9.....	130	127	170	155	170	175	155	182	784	175	144	112
10.....	132	128	170	177	228	170	158	165	374	165	134	107
11.....	397	124	217	190	755	200	160	161	34	158	127	109
12.....	330	133	226	200	847	210	158	155	65	155	161	120
13.....	574	128	220	180	372	230	161	153	542	148	138	124
14.....	289	130	201	150	228	264	156	145	453	147	542	133
15.....	203	180	188	110	211	279	158	152	456	144	532	166
16.....	186	170	180	140	257	327	152	148	372	136	279	123
17.....	161	156	172	160	419	297	143	150	302	152	224	116
18.....	150	153	166	153	352	289	160	147	276	282	197	109
19.....	148	139	155	161	338	272	158	142	27	128	180	105
20.....	144	160	156	163	318	262	163	140	27	114	170	105
21.....	134	175	163	160	492	254	161	136	276	112	155	184
22.....	139	173	153	166	1,010	237	153	138	25	112	155	195
23.....	132	1,500	155	155	844	242	152	138	275	117	153	110
24.....	126	2,190	147	148	674	257	161	140	197	139	144	105
25.....	120	628	150	152	1,230	269	173	147	191	123	140	103
26.....	119	374	148	145	1,760	262	177	197	378	116	147	105
27.....	120	297	148	147	1,800	264	173	226	370	114	140	105
28.....	116	274	142	148	1,570	247	165	205	27	110	132	103
29.....	113	245	147	139	1,090	224	160	175	150	113	128	105
30.....	112	220	150	133	-----	211	148	163	142	120	132	108
31.....	110	-----	158	120	-----	191	-----	161	-----	119	247	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	574	110	179	11,000
November.....	2,190	114	292	17,400
December.....	226	142	172	10,600
January.....	200	110	150	9,220
February.....	1,800	110	556	32,000
March.....	851	170	305	18,800
April.....	188	148	163	9,700
May.....	292	136	167	10,300
June.....	2,980	142	537	32,000
July.....	660	109	172	10,600
August.....	542	124	195	12,000
September.....	215	103	123	7,320
The year.....	2,980	103	249	181,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 8,280 second-feet Aug. 31 (gage height, 15.4 feet); minimum, 112 second-feet Aug. 30 (gage height, 2.09 feet). 1922-25, 1928-32: Maximum discharge, about 13,200 second-feet July 13, 1923 (gage height, 15.4 feet); minimum, 76 second-feet in December 1924.

REMARKS.—Records good except those estimated for periods of ice effect in January, February, and March and those for September, which are fair. Discharge interpolated Oct. 4, Apr. 17, 26, 27, May 5.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	227	127	460	266	400	1,270	322	275	460	298	220	3,130
2-----	251	136	360	242		1,000	310	264	305	264	254	1,220
3-----	290	136	318	210		790	298	252	1,800	241	292	360
4-----	250	136	279	200		680	288	252	3,420	220	231	251
5-----	216	136	254			584	288	246	1,600	959	182	194
6-----	184	136	266	150	500		288	241	1,180	1,180	148	174
7-----	174	136	242				288	310	1,130	790	292	154
8-----	154	136	231				288	310	3,130	403	220	145
9-----	145	136	231			1,360	275	461	2,100	403	200	145
10-----	136	136	242			1,980	275	279	959	335	182	136
11-----	4,920	136	242	200	2,290		264	242	1,310	264	182	127
12-----	2,770	154	346		2,840		275	231	873	230	790	145
13-----	2,980	204	402		2,290	552	264	210	873	220	360	136
14-----	1,920	227	360		916	521	264	200	752	200	264	145
15-----	1,040	360	292		592	616	252	191	648	200	750	136
16-----	454	227	279	250	522	521	252	200	682	190	630	164
17-----	330	204	242		830	584	252	191	491	190	488	154
18-----	264	239	231		959	584	252	191	403	461	330	136
19-----	216	194	231		1,220	552	264	182	375	1,920	239	127
20-----	194	184	220		1,040	491	288	191	348	522	204	120
21-----	184	184	220	800	1,000	461	298	182	322	242	184	145
22-----	164	194	220	670	1,980	403	288	182	310	191	164	112
23-----	164	1,550	210	430	2,360	403	275	164	322	182	154	488
24-----	154	5,850	200	374	1,600	552	275	173	298	200	154	227
25-----	145	5,510	200	630	1,180	648	275	164	283	346	136	174
26-----	145	1,310	200	556	1,700	616	275	191	298	231	127	145
27-----	145	710	200	460	2,100	521	275	231	716	182	120	136
28-----	136	522	200		1,920	431	275	266	648	164	127	127
29-----	136	460	200	425	1,600	403	288	305	461	156	120	127
30-----	136	556	200			348	264	318	322	164	127	120
31-----	127		220			335		1,000		191	2,770	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	4,920	127	605	37,200
November-----	5,850	127	678	40,300
December-----	460	200	258	15,900
January-----	800		313	19,200
February-----	2,840		1,230	71,000
March-----	1,270	335	538	33,100
April-----	322	252	278	16,500
May-----	1,000	164	261	16,100
June-----	3,420	283	894	53,200
July-----	1,920	156	379	23,300
August-----	2,770	120	343	21,100
September-----	3,130	112	303	18,000
The year-----	5,850	112	503	365,000

## SOLDIER CREEK AT TOPEKA, KANS.

LOCATION.—Chain gage in NW¼ sec. 18, T. 11 S., R. 15 E., at State Industrial School, in Topeka.

DRAINAGE AREA.—304 square miles.

RECORDS AVAILABLE.—May 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 5,780 second-feet Nov. 17 (gage height, 19.36 feet); minimum, 5 second-feet Sept. 21 (gage height, 2.79 feet).

1929-32: Maximum discharge, that of Nov. 17, 1931; no flow July 29, 1931.

REMARKS.—Records fair except those estimated, which are poor.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	30	332	530	95	102	80	143	164	50	26	50
2	70	30	259	490		103	76	94	99	34	37	53
3	66	31	259	225		103	80	80	72	37	37	40
4	62	32	277	430		104	76	85	85	1,470	33	18
5	50	31	259	430			72	76	68	3,800	32	14
6	54	31	220	410	125		68	72	64	910	21	12
7	50	30		370	131		80	193	53	193	29	11
8	50	44		193	131		76	171	131	510	33	10
9	42	44		186	137		80	109	370	150	33	10
10	44	44		193	137	90	76	80	209	85	23	10
11	58	46	220	193	137		68	76	120	85	20	9
12	97	46		209	131		68	72	64	80	23	10
13	117	45		1,030	104		85	64	193	76	37	11
14	97	44		591	99		109	64	56	64	17	14
15	84	4,760		186	114		60	99	43	56	193	12
16	62	650	200	242	125	120	72	99	43	53	34	12
17	54	5,500		209	332	114	114	94	43	60	46	8
18	50	3,550		225	277	114	50	94	40	50	28	9
19	45	550		209	143	104	120	90	600	43	12	8
20	45	410		225	125	104	430	90		40	18	7
21	44	351	3,500	259	110	109	193	99	150	37	12	6
22	41			242		85	157	56		37	12	277
23	45			137		99	125	570		34	8	277
24	44			94		259	120	120		33	9	37
25	42			94		277	120	85		29	9	30
26	34		175	109	110	171	109	76	125	33	16	22
27	28			157		120	99	72	209	33	8	26
28	29			157		99	99	68	85	43	10	171
29	54	430		150		94	99	53	60	33	9	43
30	34	370		94		80	120	64	56	34	10	27
31	32			85		76		679		60	209	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	117	28	54.6	3,360
November		30	1,100	65,300
December	332		214	13,200
January	1,030	85	269	16,600
February	332		128	7,360
March	277	76	111	6,800
April	430	50	106	6,310
May	679	53	125	7,710
June		40	177	10,500
July	3,800	29	266	16,400
August	209	8	33.7	2,070
September	277	6	41.5	2,470
The year		6	218	158,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 16,700 second-feet Nov. 17 (gage height, 23.13 feet); minimum, 16 second-feet Sept. 20, 21 (gage height, 2.51 feet).

1922-32: Maximum discharge, 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.

REMARKS.—Records fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	83	860	7,630	185	285	159	655	1,440	86	44	} 40
2	141	83	725	1,600	275	265	156	255	285	79	113	
3	172	86	725	860	255	242	152	255	373	118	92	
4	89	83	860	795	242	237	143	237	344	2,040	56	
5	97	81	725	1,090	280	214	136	214	185	7,560	45	
6	79	77	580	1,040	327	210	133	202	146	1,490	41	22
7	115	79	655	725	462	162	265	90	123	3,050	47	21
8	95	83	690	725	462	126	242	655	860	655	46	20
9	91	81	1,290	618	418	101	198	280	1,490	290	42	20
10	87	84	1,490	618	500	106	181	219	3,050	219	39	19
11	130	250	4,230	655	580	152	149	198	1,140	149	34	18
12	942	280	1,550	980	366	146	136	181	580	118	40	42
13	860	214	860	5,280	237	166	131	156	280	106	69	51
14	725	10,500	618	1,710	250	224	126	152	228	92	113	43
15	246	9,960	590	580	290	300	120	143	146	79	101	35
16	173	3,670	540	690	618	399	349	146	110	75	115	27
17	146	14,700	540	795	1,290	338	1,090	190	108	75	84	20
18	128	4,870	540	795	690	344	540	143	99	69	67	18
19	115	1,040	540	760	618	354	860	126	1,660	61	39	18
20	115	1,040	500	1,190	462	322	3,170	108	6,150	55	34	17
21	115	980	540	1,290	462	156	1,240	108	655	50	30	18
22	120	1,880	500	860	500	131	265	106	305	46	27	2,550
23	123	8,690	462	655	462	406	1,040	103	214	44	26	462
24	113	14,000	462	392	406	980	795	97	173	47	26	81
25	101	5,280	406	1,090	386	980	980	90	152	980	25	54
26	97	1,140	360	618	360	655	580	118	152	1,190	27	45
27	185	1,240	349	540	322	332	399	120	399	1,136	24	795
28	206	1,290	344	500	305	265	1,040	101	280	66		120
29	110	1,090	332	425	300	214	655	101	143	50		66
30	101	1,090	344	169	-----	177	462	4,540	118	46		46
31	84	-----	4,480	152	-----	166	-----	4,850	-----	45	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	942	79	195	12,000
November	14,700	77	2,800	167,000
December	4,480	332	893	54,900
January	7,630	152	1,160	71,100
February	1,290	185	424	24,400
March	980	101	295	18,200
April	3,170	120	530	31,500
May	4,850	90	482	29,600
June	6,150	99	713	42,400
July	7,560	44	618	38,000
August	115	24	54.4	3,340
September	2,550	17	160	9,510
The year	14,700	17	691	502,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 10,500 second-feet Nov. 24 (gage height, 27.82 feet); no flow several days during October and November.

1929-32: Maximum discharge, that of Nov. 24, 1931; no flow at times during 1930, 1931, and 1932. Bank-full stage, 22 feet.

REMARKS.—Records good except those for period of ice effect, Jan. 1 to Feb. 7, and those for September, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	0	263	122	54	43	66	122	16	40	6	40
2	3	0	225	106		49	62	106	9	26	6	114
3	2	0	201	106	58	46	55	106	19	25	5	32
4	1	1	201	106		43	52	114	18	263	7	20
5	2	0	201	225	58	46	49	98	13	3,310	7	8
6	2	0	180	946		43	49	86	11	3,270	5	4
7	1	0	160	346	80	46	58	140	10	776	13	6
8	1	1	160	201		43	72	150	16	237	23	5
9	0	1	263	140	76	37	66	150	17	180	7	4
10	0	1	390	150	76	34	62	250	263	160	5	4
11	1	2	390	131	76	32	49	98	106	114	4	3
12	1	5	554	150	69	34	55	90	237	170	4	3
13	1	49	360	170	55	32	49	80	72	69	25	3
14	114	1,110	592	160	49	34	43	72	55	40	32	3
15	66	3,910	250	122	55	40	40	55	52	32	14	3
16	83	535	201	94	66	46	25	49	46	30	10	3
17	43	3,470	190	114	86	55	407	49	23	23	6	2
18	7	4,250	180	131	106	55	332	66	16	21	7	2
19	5	390	170	122	90	37	263	43	19	11	6	1
20	5	304	160	122	86	46	1,080	34	1,720	18	4	0
21	4	263	160	122	69	49	799	27	1,590	14	3	2
22	3	999	535	122	76	46	332	22	461	12	4	4
23	2	8,960	250	106	76	62	225	16	86	10	3	9
24	2	9,920	131	98	72	201	237	18	69	5	3	7
25	1	2,240	114	131	66	443	225	18	49	9	2	6
26	1	535	106	90	52	225	225	14	375	8	2	5
27	0	611	106	98	37	131	180	16	799	6	1	5
28	0	535	106	98	49	114	160	18	611	5	1	4
29	0	407	106	98	49	94	150	19	106	4	1	4
30	0	332	106	58	-----	86	131	19	122	4	1	4
31	0	-----	122	50	-----	72	-----	18	-----	6	2	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	114	0	11.4	702
November	9,920	0	1,290	77,000
December	592	106	230	14,100
January	946	50	156	9,590
February	106	37	65.9	3,790
March	443	32	76.3	4,690
April	1,080	25	187	11,100
May	250	14	69.8	4,290
June	1,720	9	234	13,900
July	3,310	4	287	17,600
August	52	1	7.1	454
September	114	0	10.3	615
The year	9,920	0	218	158,000



## STRANGER CREEK NEAR TONGANOXIE, KANS.

LOCATION.—Chain gage in NE¼ sec. 13, T. 11 S., R. 21 E., 4 miles east of Tonganoxie and 9 miles above junction with Kansas River.

DRAINAGE AREA.—406 square miles.

RECORDS AVAILABLE.—May 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 8,700 second-feet Nov. 24 (gage height, 26.36 feet); minimum, 3 second-feet Sept. 26.

1929-32: Maximum discharge, 10,600 second-feet June 2, 1929 (gage height, 26.46 feet); minimum, 1 second-foot Sept. 30, 1929, Aug. 6-11, 1930. Bank-full stage, 23 feet.

Maximum stage known, 27.31 feet Apr. 21, 1929 (discharge, 15,307 second-feet).

REMARKS.—Records good except those for October, November, and September and those estimated for period of ice effect, Jan. 27 to Feb. 7, which are fair.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	29	274	2,160	110	101	131	177	1,630	116	14	81
2	12	26	246	2,540		96	126	161	342	49	14	126
3	11	23	216	1,080		96	121	151	255	31	29	43
4	101	20	209	354		96	121	146	216	31	61	18
5	77	17	202	1,200		96	116	136	101	1,220	20	12
6	47	16	189	1,250	136	91	116	131	77	1,080	39	6
7	31	14	171	632		81	126	195	69	264	65	5
8	13	13	166	330		73	116	223	390	101	106	4
9	4	12	284	295		69	111	183	1,250	53	39	4
10	3	14	570	264		69	106	136	1,330	37	20	3
11	29	69	1,120	246	151	69	101	116	1,060	53	14	3
12	230	354	1,200	264	151	73	96	106	189	49	11	3
13	246	971	696	648	131	73	96	96	189	39	9	4
14	116	2,810	342	1,270	126	77	96	86	318	35	9	16
15	81	2,810	274	794	121	81	91	86	216	31	10	22
16	49	3,150	255	442	141	86	101	264	101	26	9	13
17	19	4,020	230	246	202	91	442	429	69	24	7	6
18	22	3,640	216	238	416	96	777	126	57	22	6	4
19	18	4,120	202	223	177	96	284	86	57	20	6	4
20	14	1,950	195	223	141	96	1,060	73	1,060	19	6	3
21	14	483	195	274	136	91	1,470	69	1,550	18	6	3
22	13	1,770	189	284	131	91	342	65	209	17	5	4
23	13	5,530	183	216	126	101	1,930	61	101	16	4	3
24	11	7,820	171	177	121	195	2,600	61	77	14	4	3
25	11	5,700	156	156	116	777	1,710	57	69	15	4	3
26	12	4,020	151	166	111	953	416	61	81	16	15	3
27	14	1,270	146	177	106	264	318	65	96	26	39	8
28	26	555	146	166	106	171	246	69	65	41	13	18
29	31	442	146	146	101	166	216	69	61	23	8	26
30	33	354	141	126	-----	151	195	69	61	18	6	7
31	29	-----	935	121	-----	141	-----	171	-----	16	9	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	246	3	43.2	2,660
November	7,820	12	1,730	103,000
December	1,200	141	317	19,500
January	2,540	121	539	33,100
February	416	101	138	7,910
March	953	69	155	9,530
April	2,600	91	459	27,300
May	429	57	127	7,780
June	1,630	57	378	22,500
July	1,220	14	113	6,970
August	106	4	19.6	1,200
September	126	3	15.3	908
The year	7,820	3	334	243,000

## GRAND RIVER BASIN

## GRAND RIVER NEAR GALLATIN, MO.

LOCATION.—Chain gage in NW¼ sec. 16, T. 59 N., R. 27 W., 1,000 feet above Chicago, Rock Island & Pacific Railway bridge and 2 miles northeast 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 1932.

EXTREMES.—Maximum discharge during year, 33,600 second-feet Nov. 25 (gage height, 33.16 feet); minimum, 50 second-feet Sept. 29, 30 (gage height, 2.52 feet).

1921-32: Maximum discharge, 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).

Maximum stage known, 39.3 feet in July 1909.

REMARKS.—Records good. Discharge estimated Nov. 6.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	422	235	2,400	17,800	497	840	524	470	2,570	235	66	524
2.....	326	226	1,960	23,000	578	721	470	422	900	207	2,510	578
3.....	280	207	1,620	21,100	524	810	446	374	10,600	180	1,620	350
4.....	246	198	1,540	4,140	422	810	398	350	16,300	198	2,460	246
5.....	216	198	1,540	2,960	422	1,380	374	326	12,400	3,940	840	198
6.....	216	189	1,580	6,460	422	551	350	303	3,880	3,940	398	162
7.....	216	180	1,420	3,660	446	634	326	326	1,340	964	280	135
8.....	6,810	180	1,270	1,910	524	374	470	446	996	578	1,380	119
9.....	5,760	180	1,310	1,580	551	374	1,200	1,420	750	350	1,230	108
10.....	1,960	180	2,960	1,420	692	374	780	840	810	268	721	119
11.....	3,940	180	6,740	1,420	840	374	470	470	2,020	257	303	119
12.....	13,100	524	10,400	1,340	1,620	350	398	374	996	235	235	98
13.....	8,450	2,570	6,110	7,480	964	280	326	303	1,420	189	226	98
14.....	6,040	11,800	3,620	8,980	750	257	326	257	1,090	153	1,340	119
15.....	2,680	19,200	2,120	3,750	578	280	292	235	1,270	135	2,680	85
16.....	1,540	20,300	1,670	2,020	524	326	292	326	1,270	108	5,830	78
17.....	1,030	14,700	1,540	1,500	721	470	326	280	634	98	5,970	72
18.....	750	17,300	1,500	1,810	1,860	524	497	422	634	98	6,460	69
19.....	634	18,700	1,720	1,500	1,500	578	470	303	840	350	4,530	60
20.....	524	6,530	1,420	1,380	1,230	578	398	235	1,270	78	1,960	63
21.....	470	2,900	1,380	2,020	1,130	497	470	198	1,500	69	1,030	58
22.....	422	4,660	1,270	3,690	1,090	446	840	162	470	63	524	81
23.....	398	15,500	1,230	2,290	1,340	235	3,200	153	350	63	374	115
24.....	374	23,800	1,200	1,500	1,060	470	4,200	135	303	78	303	119
25.....	326	31,600	1,060	932	932	3,380	4,600	135	268	303	257	78
26.....	326	31,100	932	810	840	5,900	2,570	121	257	470	257	63
27.....	326	9,200	870	964	840	2,960	1,030	110	470	126	470	63
28.....	551	3,380	840	900	870	1,620	692	103	326	85	326	55
29.....	350	3,140	810	900	870	1,030	551	100	268	72	268	50
30.....	303	2,850	810	750	-----	810	497	103	246	58	207	50
31.....	292	-----	1,760	578	-----	634	-----	750	-----	55	189	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acro-feet
October.....	13,100	216	1,910	0.849	0.98	117,000
November.....	31,600	180	8,060	3.58	3.99	480,000
December.....	10,400	810	2,150	.956	1.10	132,000
January.....	23,000	578	4,210	1.87	2.16	259,000
February.....	1,860	422	851	.378	.41	49,000
March.....	5,900	235	931	.414	.48	57,200
April.....	4,600	292	926	.412	.46	56,100
May.....	1,420	100	340	.151	.17	20,900
June.....	16,300	246	2,210	.982	1.10	132,000
July.....	3,940	55	443	.197	.23	27,200
August.....	6,460	66	1,460	.649	.75	89,800
September.....	578	50	138	.061	.07	8,210
The year.....	31,600	50	1,970	.876	11.90	1,430,000

## GRAND RIVER NEAR SUMNER, MO.

LOCATION.—Chain gage in NE¼ sec. 29, T. 56 N., R. 21 W., 80 feet below Chicago, Burlington & Quincy Railroad bridge 2 miles southwest 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 1932.

EXTREMES.—Maximum discharge during year, 84,600 second-feet Nov. 26 (gage height, 33.30 feet); minimum, 180 second-feet Aug. 1 (gage height, 3.40 feet).

1924-32: Maximum discharge, 110,000 second-feet June 4, 1929; maximum gage height, 35.35 feet Nov. 20, 1928; minimum discharge, 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. Discharge estimated Dec. 31 and for period of ice effect, Mar. 10-13.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,540	1,160	14,800	31,300	1,430	2,840	2,000	1,880	6,100	1,380	180	1,600
2	1,160	940	8,280	41,400	1,650	2,720	1,650	1,700	5,370	940	11,800	2,660
3	940	840	5,130	51,100	1,820	2,600	1,480	1,540	9,620	740	17,300	2,180
4	790	790	4,200	52,900	1,540	2,910	1,380	1,380	23,500	1,160	14,500	1,380
5	690	690	3,910	43,500	1,540	3,040	1,210	1,260	30,300	3,560	7,740	990
6	840	640	3,840	37,400	1,700	2,600	1,160	1,160	31,300	9,900	2,540	740
7	1,260	640	3,630	35,000	1,650	1,940	1,040	1,160	15,300	7,120	1,480	640
8	12,600	590	3,300	22,200	1,760	1,480	990	2,240	4,890	2,840	6,520	590
9	18,200	590	3,100	11,300	1,880	1,040	2,540	6,440	2,600	1,540	8,460	545
10	15,300	545	4,080	4,970	2,180	1,040	2,840	5,610	2,060	1,040	4,500	590
11	5,690	590	8,540	3,980	2,840	990	2,000	3,700	2,120	940	1,940	840
12	16,600	7,740	22,200	4,130	3,770	990	1,260	2,240	2,980	1,260	1,260	1,260
13	24,900	9,800	24,900	4,430	5,280	1,040	1,160	1,600	2,360	790	1,160	940
14	25,700	10,400	20,800	16,100	3,770	1,160	990	1,260	4,080	545	1,210	790
15	16,600	31,300	13,800	18,400	2,660	1,210	890	1,040	2,910	545	14,500	790
16	9,000	38,600	7,030	10,700	2,240	1,320	840	890	4,080	465	21,900	690
17	4,130	48,400	5,530	5,850	3,500	1,540	940	1,210	2,720	385	23,500	545
18	2,720	56,500	4,660	5,450	6,100	1,760	1,160	1,430	1,650	385	25,300	545
19	2,120	60,500	4,730	5,610	6,690	2,000	1,540	1,380	1,700	365	28,100	1,210
20	1,700	58,500	4,660	4,660	5,050	2,180	1,430	1,040	2,540	345	28,500	1,040
21	1,430	50,200	4,810	4,500	4,430	2,180	1,260	840	4,280	325	15,400	590
22	1,320	38,600	5,130	6,600	3,700	2,000	10,300	690	3,040	305	7,460	545
23	1,160	37,400	3,910	8,100	3,630	2,240	15,300	590	1,540	305	2,660	590
24	1,100	47,500	3,700	6,440	3,700	3,170	14,800	505	1,100	305	1,700	545
25	1,040	64,800	3,430	4,430	3,360	6,100	12,700	465	990	285	1,380	505
26	990	83,300	2,980	3,100	2,910	13,300	8,180	465	790	405	2,180	445
27	1,260	76,800	2,660	2,910	2,660	15,800	5,210	445	890	2,180	2,840	405
28	5,210	67,000	2,360	3,170	2,720	8,180	3,170	405	3,700	840	2,600	385
29	3,630	47,500	2,420	3,040	2,840	4,280	2,420	385	3,170	425	1,760	345
30	1,940	28,100	8,000	2,780	-----	2,980	2,060	365	2,420	325	1,160	325
31	1,320	-----	13,000	1,700	-----	2,420	-----	425	-----	248	890	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	25,700	690	5,900	0.858	0.99	363,000
November	83,300	545	29,000	4.22	4.71	1,730,000
December	24,900	2,360	7,210	1.05	1.21	443,000
January	52,900	1,700	14,700	2.14	2.47	904,000
February	6,690	1,430	3,070	.446	.48	177,000
March	15,800	990	3,200	.465	.54	197,000
April	15,300	840	3,460	.503	.56	206,000
May	6,440	365	1,480	.215	.25	91,000
June	31,300	790	6,000	.872	.97	357,000
July	9,900	248	1,360	.198	.23	83,600
August	28,500	180	8,470	1.23	1.42	521,000
September	2,660	325	842	.122	.14	50,100
The year	83,300	180	7,060	1.03	13.97	5,120,000

## THOMPSON RIVER AT TRENTON, MO.

LOCATION.—Chain gage in SE¼ sec. 20, T. 61 N., R. 24 W., 1 mile south of Trenton. Chain gage located 2 miles upstream was used prior to Oct. 1, 1930.

DRAINAGE AREA.—1,680 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 26,700 second-feet Dec. 31 (gage height, 21.1 feet); minimum, 57 second-feet July 29, 30.

1928-32: Maximum discharge, 26,700 second-feet Nov. 18, 1928, Dec. 31, 1931; maximum gage height, 22.31 feet (former location) Nov. 18, 1928; minimum discharge, 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, Jan. 31 to Feb. 10, Mar. 8-15, which are poor.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	235	210	1,350	20,100	685	940	464	685	1,350	342	6,100	510
2.....	182	196	1,260	14,500	685	887	424	635	735	233	9,420	408
3.....	160	182	1,180	6,420	685	1,350	368	568	8,850	195	8,490	266
4.....	131	157	1,110	2,100	685	1,440	349	504	6,420	1,090	2,000	205
5.....	116	157	1,110	2,000	685	887	313	504	4,750	3,740	510	170
6.....	258	152	995	4,190	685	635	313	464	2,330	1,250	303	151
7.....	13,300	143	940	1,900	685	226	295	568	887	538	6,420	137
8.....	8,130	143	835	1,440	685	210	2,570	3,350	565	303	6,760	107
9.....	4,750	143	785	1,350	735	210	1,110	1,260	565	233	1,010	99
10.....	2,100	139	2,830	1,180	835	210	685	1,110	484	233	408	484
11.....	10,400	148	6,930	1,440	940	210	464	785	362	183	284	433
12.....	6,250	1,900	7,270	1,440	3,220	242	386	590	322	153	266	249
13.....	3,350	2,960	3,910	5,500	1,260	242	349	484	1,700	144	745	176
14.....	2,960	18,800	2,000	6,590	835	313	313	424	842	144	6,930	192
15.....	1,350	11,300	1,530	2,700	635	313	277	386	3,880	126	11,700	137
16.....	735	7,100	1,530	1,900	504	386	295	464	940	95	7,780	119
17.....	590	14,500	1,620	1,900	1,260	464	368	940	458	91	11,300	160
18.....	525	10,800	1,530	2,100	2,830	484	386	785	362	87	12,700	119
19.....	424	9,610	1,530	1,530	2,000	546	313	464	284	80	12,900	115
20.....	368	2,210	2,000	1,530	1,900	590	313	368	342	76	5,050	95
21.....	331	2,210	1,530	2,210	1,260	504	735	295	385	74	875	408
22.....	295	3,630	1,350	3,220	1,440	424	8,670	277	322	73	538	249
23.....	295	18,000	1,180	3,490	1,180	349	8,130	260	249	70	510	181
24.....	277	24,700	1,050	1,710	1,260	484	7,270	242	217	119	362	119
25.....	242	16,100	887	995	887	4,470	4,190	242	192	84	303	103
26.....	242	11,500	785	887	785	5,350	1,900	226	176	205	875	91
27.....	835	6,420	735	887	835	2,000	1,180	210	1,800	80	1,010	87
28.....	590	1,800	685	940	940	1,110	995	210	2,220	63	385	80
29.....	349	1,620	685	887	995	785	835	196	2,110	57	284	73
30.....	210	1,710	735	785	-----	635	735	210	778	57	284	70
31.....	277	-----	13,100	785	-----	504	-----	2,330	-----	73	217	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	13,300	116	1,940	1.15	1.33	119,000
November.....	24,700	139	5,620	3.35	3.74	334,000
December.....	13,100	685	2,100	1.25	1.44	129,000
January.....	20,100	785	3,180	1.89	2.18	196,000
February.....	3,220	504	1,100	.655	.71	63,300
March.....	5,350	210	884	.526	.61	54,400
April.....	8,670	277	1,500	.893	1.00	89,300
May.....	3,350	196	646	.385	.44	39,700
June.....	8,850	176	1,500	.893	1.00	89,300
July.....	3,740	57	332	.198	.23	20,400
August.....	12,900	217	3,770	2.24	2.58	232,000
September.....	510	70	193	.115	.13	11,500
The period.....	24,700	57	1,900	1.13	15.39	1,380,000

## WELDON RIVER AT MILL GROVE, MO.

LOCATION.—Chain gage in SE¼ SE¼ sec. 28, T. 64 N., R. 24 W., at county highway bridge in Mill Grove.

DRAINAGE AREA.—494 square miles.

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 12,400 second-feet Aug. 2 (gage height, 20.1 feet); minimum, 4.4 second-feet Sept. 30.

1929-32: Maximum discharge, 14,000 second-feet June 2, 1929 (gage height, 20.6 feet); minimum discharge, 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. Stage-discharge relation affected by ice Jan. 9, 31, Mar. 8-12.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	59	87	330	7, 530	87	200	92	135	315	48	2, 500	118
2-----	55	82	256	4, 900	87	200	87	122	122	45	9, 400	63
3-----	54	77	214	540	68	228	82	103	2, 040	42	2, 540	36
4-----	52	77	228	375	82	161	72	92	1, 860	42	428	22
5-----	48	68	242	466	68	135	72	87	1, 420	77	156	12
6-----	47	68	228	1, 090	77	103	68	82	345	97	92	9
7-----	4, 020	64	200	483	77	92	68	375	174	122	3, 120	8
8-----	5, 060	64	174	300	315	87	984	720	116	64	1, 280	7
9-----	560	59	168	242	256	68	214	228	174	59	259	6
10-----	242	68	580	187	148	68	135	135	97	68	115	400
11-----	1, 860	82	2, 320	174	483	59	97	109	77	48	81	74
12-----	3, 490	900	3, 120	187	680	50	87	87	68	39	69	26
13-----	760	963	800	2, 110	200	55	77	82	270	38	482	79
14-----	820	2, 190	483	1, 500	122	68	72	77	984	36	1, 250	28
15-----	345	4, 410	375	375	116	148	72	72	760	35	5, 310	12
16-----	256	3, 170	405	285	97	142	68	256	187	34	4, 540	9
17-----	187	2, 910	360	300	660	135	77	200	116	34	6, 510	6
18-----	154	5, 840	375	405	760	122	92	103	87	33	8, 560	7
19-----	135	3, 060	520	285	450	109	77	77	285	32	5, 840	6
20-----	122	680	540	256	270	103	72	68	92	31	800	7
21-----	109	942	345	375	187	97	1, 250	59	87	30	300	84
22-----	97	1, 160	300	560	228	116	5, 400	54	77	29	172	24
23-----	87	4, 410	285	315	214	116	1, 500	48	68	30	104	13
24-----	92	10, 900	242	200	161	122	1, 860	47	64	38	74	9
25-----	97	5, 840	200	161	148	1, 130	580	45	54	35	57	6
26-----	330	1, 030	174	174	174	1, 160	360	44	50	34	800	5
27-----	520	501	161	168	200	740	242	43	59	128	300	5
28-----	285	466	161	161	214	242	187	41	54	30	59	4. 7
29-----	148	466	148	168	214	174	161	39	103	29	36	4. 7
30-----	116	420	375	116	-----	135	154	39	64	29	26	4. 4
31-----	97	-----	4, 280	97	-----	109	-----	200	-----	29	16	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October-----	5, 060	47	655	1. 33	1. 53	40, 300
November-----	10, 900	59	1, 700	3. 44	3. 84	101, 000
December-----	4, 280	148	600	1. 21	1. 40	36, 900
January-----	7, 530	97	790	1. 60	1. 84	48, 600
February-----	760	68	235	. 476	. 51	13, 500
March-----	1, 160	50	209	. 423	. 49	12, 900
April-----	5, 400	68	479	. 970	1. 08	28, 500
May-----	720	39	125	. 253	. 29	7, 690
June-----	2, 040	50	342	. 692	. 77	20, 400
July-----	128	29	47. 3	. 096	. 11	2, 910
August-----	9, 400	16	1, 780	3. 60	4. 15	109, 000
September-----	400	4. 4	36. 5	. 074	. 08	2, 170
The year-----	10, 900	4. 4	585	1. 18	16. 09	424, 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 1932.

EXTREMES.—Maximum discharge during year, 7,760 second-feet Aug. 2 (gage height, 11.86 feet); minimum, 3.2 second-feet July 28 (gage height, 3.02 feet).

1921-32: Maximum discharge, that of Aug. 2, 1932; maximum gage height, 15.60 feet Apr. 20, 1929; minimum discharge, less than 1 second-foot Aug. 22, 29, 1922.

REMARKS.—Records fair except those for periods of ice effect, Jan. 30 to Feb. 3, Mar. 6-16, which are poor. Discharge estimated Oct. 21, Dec. 4.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	38	127	3,400	28	61	48	58	61	23	1,570	62
2	14	33	71	2,020	28	58	40	47	53	15	6,000	46
3	9	30	68	178	28	71	35	44	1,930	14	1,840	51
4	8	22	73	135	21	71	30	36	1,930	84	216	24
5	7	22	78	169	50	48	26	32	430	387	51	20
6	8	18	85	1,090	53	40	32	32	143	169	28	13
7	2,920	16	62	267	58	28	32	78	84	92	2,380	8
8	1,010	16	51	135	64	28	29	1,930	53	39	1,840	11
9	348	14	65	104	81	18	97	1,250	36	19	216	71
10	112	16	143	92	84	18	44	178	29	196	65	112
11	1,840	13	970	72	90	18	32	127	25	120	43	135
12	1,570	127	1,090	84	120	18	23	86	21	48	43	57
13	1,250	24	415	324	86	18	21	64	104	20	35	51
14	415	5,100	415	575	41	18	19	50	29	14	2,480	85
15	374	2,380	178	169	53	18	17	44	39	11	2,020	43
16	336	1,660	178	84	39	28	21	44	78	9	1,930	24
17	169	2,800	196	135	178	48	32	47	50	7	4,220	14
18	76	2,290	189	152	187	54	27	39	81	7	2,920	33
19	48	2,290	216	96	120	68	32	32	19	5	2,580	33
20	38	300	236	120	84	57	34	29	41	5	187	35
21	33	206	152	135	81	54	1,570	21	34	7	85	16
22	28	336	127	236	84	14	1,750	19	19	6	57	14
23	28	2,480	127	178	81	46	660	16	14	5	38	33
24	30	5,100	112	96	67	79	336	17	23	7	30	20
25	60	4,360	112	64	61	660	267	15	17	6	26	14
26	79	336	79	72	61	790	143	14	14	7	46	11
27	1,010	169	76	72	78	324	104	14	84	5	152	9
28	790	169	74	78	75	143	78	10	206	3.2	76	11
29	127	160	71	78	67	97	69	8	92	4.0	38	8
30	68	152	91	54	-----	79	67	10	36	4.0	24	8
31	51	-----	6,160	54	-----	57	-----	29	-----	5	20	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	2,920	7	415	1.84	2.12	25,500
November	5,100	13	1,020	4.53	5.05	60,700
December	6,160	51	389	1.73	1.99	23,900
January	3,400	54	339	1.51	1.74	20,800
February	187	21	74.1	.329	.35	4,260
March	790	14	101	.449	.52	6,210
April	1,750	17	190	.844	.94	11,800
May	1,930	8	143	.636	.73	8,790
June	1,930	14	192	.853	.95	11,400
July	387	3.2	43.3	.192	.22	2,660
August	6,000	20	1,010	4.49	5.18	62,100
September	135	8	35.7	.159	.18	2,120
The year	6,160	3.2	331	1.47	19.97	240,000



## 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 1932.

EXTREMES.—Maximum discharge during year, 9,190 second-feet Nov. 24 (gage height, 12.44 feet); minimum, 7 second-feet July 23.

1929-32: Maximum discharge, 10,400 second-feet Apr. 21, 1929 (gage height, 15.74 feet); minimum discharge, 2.5 second-feet Jan. 9-20, 1931; minimum gage height, 3.08 feet Sept. 14, 1931.

REMARKS.—Records fair except those for periods of ice effect, Jan. 30 to Feb. 5, Mar. 6-15, which are poor.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	121	298	6,650	50	97	95	118	99	34	950	350
2	35	117	228	2,940	50	81	76	105	111	19	5,400	120
3	30	106	190	950	50	81	72	89	2,320	17	2,100	129
4	25	95	177	332	50	105	68	74	2,200	1,140	476	83
5	15	88	177	332	68	81	61	63	1,640	2,200	141	54
6	20	92	190	2,290	89	68	50	63	476	610	48	47
7	1,820	85	153	1,140	93	50	54	70	202	153	1,640	40
8	3,300	81	141	430	85	50	61	3,300	109	99	2,100	34
9	1,080	81	141	202	70	34	129	1,820	91	57	640	31
10	238	81	268	177	122	34	107	501	61	190	153	228
11	1,140	81	1,300	190	122	34	68	298	57	254	74	409
12	2,700	950	2,380	190	190	34	44	190	37	99	55	111
13	2,290	950	1,080	553	190	34	44	129	388	54	33	125
14	1,020	4,650	1,380	1,300	118	34	31	107	91	31	1,080	76
15	820	5,400	640	476	66	50	31	91	254	24	3,180	99
16	284	2,700	453	202	74	40	34	79	254	12	2,480	54
17	196	5,250	430	228	670	91	54	107	76	14	4,360	40
18	146	4,220	388	369	453	68	68	87	50	12	4,500	40
19	136	2,820	453	268	350	107	68	72	57	9	3,540	129
20	125	730	453	190	190	99	54	57	388	10	820	54
21	113	530	350	241	177	83	1,140	44	57	9	254	44
22	103	1,080	268	453	141	26	2,820	44	40	9	177	37
23	99	4,080	254	430	141	99	2,000	40	21	7	129	72
24	95	8,920	228	228	127	202	1,550	37	17	14	107	47
25	103	6,010	190	129	105	1,550	730	34	31	9	87	31
26	121	1,460	177	105	101	1,460	298	31	14	68	190	24
27	820	476	141	141	101	730	228	29	700	26	129	29
28	1,640	369	129	141	114	332	153	29	430	14	254	21
29	328	369	125	127	109	228	141	26	282	9	107	14
30	186	369	129	87	-----	177	129	24	64	10	72	14
31	136	-----	6,330	68	-----	120	-----	29	-----	10	57	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	3,300	15	620	1.68	1.94	38,100
November	8,920	81	1,750	4.76	5.31	104,000
December	6,330	125	621	1.69	1.95	38,200
January	6,650	68	695	1.89	2.18	42,700
February	670	50	147	.399	.43	8,460
March	1,550	26	203	.552	.64	12,500
April	2,820	31	349	.948	1.06	20,800
May	3,300	24	251	.682	.79	15,400
June	2,820	14	371	1.01	1.13	22,100
July	2,200	7	168	.457	.53	10,300
August	5,400	33	1,140	3.10	3.57	70,100
September	409	14	86.2	.234	.26	5,130
The year	8,920	7	534	1.45	19.79	388,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 3,230 second-feet Aug. 18 (gage height, 18.12 feet); minimum discharge, 6 second-feet June 25, 26, Sept. 30; minimum gage height, 2.08 feet June 25, 26.

1921-32: Maximum discharge, 3,880 second-feet Nov. 18, 1928 (gage height, 20.07 feet); minimum, 0.1 second-foot Aug. 8, 1930.

REMARKS.—Records fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	34	154	2,650	42	44	44	58	61	19	1,100	96
2	14	30	130	2,770	32	42	39	49	256	16	2,000	50
3	12	28	102	1,060	28	44	36	44	180	13	3,170	31
4	11	25	102	197	26	46	32	42	1,170	58	1,320	29
5	9	23	109	197	24	42	30	36	558	256	110	22
6	8	20	102	1,750	28	30	28	34	198	268	58	16
7	1,290	18	88	1,420	34	32	28	138	52	88	940	15
8	2,260	16	74	268	28	36	28	944	36	52	2,140	13
9	344	16	81	138	46	23	67	630	28	46	1,090	40
10	102	18	179	116	61	8	39	280	25	710	87	33
11	710	17	670	102	70	13	28	102	19	206	87	64
12	1,160	330	1,090	116	138	12	24	64	20	58	40	42
13	1,240	968	508	444	81	9	21	49	18	46	40	35
14	710	1,970	670	508	42	15	20	42	14	28	1,350	61
15	330	2,740	268	162	36	18	19	34	84	24	2,000	47
16	130	2,770	246	102	39	28	18	34	28	23	2,320	21
17	78	2,620	216	138	188	42	22	39	21	20	2,920	15
18	58	2,350	197	197	197	42	30	32	18	17	3,200	154
19	44	2,440	216	130	123	46	26	28	17	16	2,950	100
20	34	476	216	116	74	44	30	22	22	15	964	27
21	30	372	162	138	58	39	1,020	18	11	13	164	15
22	26	372	130	216	64	28	2,320	17	9	13	92	16
23	28	2,000	130	179	55	26	900	14	8	13	61	11
24	30	2,680	102	109	49	81	226	13	7	13	42	9
25	32	3,010	88	58	49	730	162	12	6	13	35	8
26	39	2,680	74	74	49	690	116	12	6	13	134	8
27	256	330	64	70	55	358	84	10	19	11	244	7
28	540	226	61	74	55	146	70	10	812	11	71	10
29	84	226	58	74	49	88	64	9	84	12	37	7
30	49	197	508	55	64	64	8	28	10	12	27	6
31	42	-----	2,350	49	-----	55	-----	3	-----	12	134	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	2,260	8	313	1.39	1.60	19,200
November	3,010	16	967	4.30	4.80	57,500
December	2,350	58	295	1.31	1.51	18,100
January	2,770	49	441	1.96	2.26	27,100
February	197	24	62.8	.279	.30	3,610
March	730	8	94.2	.419	.48	5,790
April	2,320	18	188	.836	.93	11,200
May	944	8	92.1	.406	.47	5,660
June	1,190	6	124	.551	.61	7,380
July	710	10	68.2	.308	.35	4,190
August	3,200	27	936	4.16	4.80	57,600
September	154	6	33.6	.149	.17	2,000
The year	3,200	6	302	1.34	18.28	219,000



## 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 1932.

EXTREMES.—Maximum discharge during year, 8,900 second-feet Nov. 23 (gage height, 16.04 feet); minimum, 12 second-feet July 28, 29 (gage height, 2.78 feet).

1929-32: Maximum discharge, 14,100 second-feet Apr. 21, 1929 (gage height, 20.89 feet); minimum discharge, 3.6 second-feet Oct. 2, 1930; minimum gage height, 2.56 feet Sept. 13, 16, 1931.

REMARKS.—Records good. Discharge estimated Feb. 4, 20, Mar. 9, Apr. 5, May 4, Sept. 26. Stage-discharge relation affected by ice Mar. 7-14.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	82	334	5,760	200	149	109	131	200	40	1,630	224
2	27	60	263	4,030	178	149	102	113	473	35	5,290	168
3	22	63	200	3,010	140	149	93	92	2,030	22	2,770	113
4	19	60	200	2,240	140	140	85	90	1,290	2,380	4,390	109
5	16	56	200	822	140	200	77	89	2,530	1,240	5,380	76
6	102	48	189	3,180	140	319	69	200	606	572	1,450	57
7	40	48	189	2,240	200	131	79	349	178	212	189	45
8	4,120	45	189	748	379	113	73	860	113	106	1,510	40
9	2,240	47	178	473	131	95	212	1,340	82	60	2,240	38
10	319	45	676	276	149	79	122	572	63	168	349	69
11	1,150	379	2,380	276	263	79	113	237	51	290	149	109
12	3,010	1,890	1,890	290	319	79	65	168	40	106	189	99
13	3,520	1,890	1,570	712	263	79	58	131	35	63	89	92
14	2,610	6,800	1,400	1,060	178	95	62	99	69	40	572	89
15	1,060	5,760	940	676	131	131	56	95	63	33	3,520	131
16	410	4,750	538	334	149	140	54	304	149	29	5,470	90
17	212	6,420	473	410	940	140	122	79	69	27	3,100	54
18	189	4,030	473	304	785	149	97	69	82	22	6,420	1,440
19	131	3,260	441	349	410	200	77	63	82	19	6,320	441
20	106	2,170	441	319	311	189	74	54	1,060	17	3,010	100
21	89	900	410	379	212	200	1,150	48	89	15	219	63
22	66	1,690	334	505	212	334	3,350	43	54	16	263	43
23	89	8,040	290	505	200	473	3,100	40	35	16	189	35
24	87	7,280	276	276	189	572	606	38	32	17	122	31
25	85	5,290	224	178	168	1,240	364	33	27	15	54	28
26	89	4,300	200	189	158	1,890	304	31	25	212	122	29
27	640	1,200	168	189	158	712	200	31	606	17	538	25
28	676	606	158	200	158	505	168	29	473	12	263	23
29	364	538	113	212	158	237	149	27	349	12	122	22
30	149	410	189	178	158	168	140	27	73	13	92	22
31	106	7,940	349	-----	-----	140	-----	189	-----	16	58	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	A cre-feet
October	4,120	16	702	1.28	1.48	43,200
November	8,040	45	2,270	4.13	4.61	135,000
December	7,940	113	757	1.38	1.59	46,500
January	5,760	178	992	1.80	2.08	61,000
February	940	131	247	.449	.48	14,200
March	1,890	79	299	.544	.63	18,400
April	3,350	54	378	.687	.77	22,500
May	1,310	27	183	.333	.38	11,300
June	2,530	25	368	.669	.75	21,900
July	2,380	12	188	.342	.39	11,600
August	6,420	54	1,810	3.29	3.79	111,000
September	1,440	22	130	.236	.26	7,740
The year	8,040	12	696	1.27	17.21	504,000

## YELLOW CREEK NEAR ROTHVILLE, MO.

LOCATION.—Chain gage on line between NW¼ sec. 31, T. 56 N., R. 19 W., and NE¼ sec. 36, T. 56 N., R. 20 W., at county highway bridge 2½ miles southwest of Rothville.

DRAINAGE AREA.—442 square miles.

RECORDS AVAILABLE.—April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 7,400 second-feet Nov. 25 (gage height, 21.16 feet); minimum, 7 second-feet Oct. 5, 6, May 28 to June 1.

1929-32: Maximum discharge, that of Nov. 25, 1931; minimum discharge, 0.8 second-foot Nov. 6, 7, 1930; minimum gage height, 2.05 feet Sept. 19, 1931.

REMARKS.—Records good.

*Discharge, in second-feet, 1929-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	28	70	362	2,500	112	85	91	54	7
2.....	16	42	292	3,640	76	85	76	47	8
3.....	11	28	237	3,920	57	98	64	42	373
4.....	8	25	174	2,280	54	119	54	34	384
5.....	7	16	158	1,250	57	126	47	28	571
6.....	7	14	158	1,800	52	119	42	26	450
7.....	76	11	142	2,240	57	98	40	26	637
8.....	34	11	126	1,350	60	91	42	70	228
9.....	73	10	119	538	73	91	42	44	76
10.....	417	11	342	322	112	70	42	73	37
11.....	538	12	858	302	142	52	34	142	24
12.....	362	91	1,320	219	672	44	28	105	18
13.....	648	1,210	1,220	312	505	32	28	62	14
14.....	1,170	1,250	1,240	604	342	25	24	40	22
15.....	1,350	1,320	1,010	538	183	42	20	30	42
16.....	684	1,970	648	450	166	54	20	22	79
17.....	342	2,500	428	312	461	67	28	19	22
18.....	134	3,030	373	312	884	98	40	16	15
19.....	79	3,440	282	342	582	142	34	14	10
20.....	54	3,640	255	312	428	183	32	13	47
21.....	40	2,170	246	264	255	201	67	11	183
22.....	28	1,240	228	322	210	228	527	10	582
23.....	24	1,870	210	494	174	571	975	10	174
24.....	20	3,300	201	406	150	615	672	9	79
25.....	19	7,400	192	312	134	744	312	8	26
26.....	22	5,450	166	192	126	806	174	8	15
27.....	25	3,640	126	183	112	648	119	8	884
28.....	37	2,240	112	174	105	428	85	7	884
29.....	32	897	105	183	91	322	67	7	126
30.....	26	439	91	158	-----	150	57	7	57
31.....	42	-----	793	119	-----	112	-----	7	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	1,350	7	205	0.464	0.53	12,600
November.....	7,400	10	1,580	3.57	3.98	94,000
December.....	1,320	91	394	.891	1.03	24,200
January.....	3,920	119	850	1.92	2.21	52,300
February.....	884	52	222	.502	.54	12,800
March.....	806	25	211	.477	.55	13,000
April.....	975	20	129	.292	.33	7,680
May.....	142	7	32.2	.073	.08	1,980
June.....	884	7	202	.457	.51	12,000
The period.....					-----	231,000

## CHARITON RIVER BASIN

## CHARITON RIVER AT NOVINGER, MO.

LOCATION.—Chain gage in W½ 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 1932.

EXTREMES.—1931-32: Maximum discharge, 15,400 second-feet Nov. 25, 1931 (gage height, 26.03 feet); minimum discharge, 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 good. Discharge estimated Mar. 7, 28, 1931. Stage-discharge relation affected by ice Jan. 16-23, Feb. 10, 1931.

*Discharge, in second-feet, 1931-32*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931									
1. ....		28	26	1,360	270	4,180	86	27	185
2. ....		19	20	1,420	322	1,310	74	23	197
3. ....		26	22	2,070	270	578	152	18	420
4. ....		26	17	2,010	221	435	104	17	163
5. ....		24	18	1,210	209	1,570	70	17	152
6. ....		26	19	860	185	6,350	63	25	113
7. ....		28	20	632	152	6,660	74	21	78
8. ....		32	22	465	174	4,230	95	45	56
9. ....		24	22	405	163	3,070	86	45	41
10. ....		25	35	465	163	3,440	86	86	29
11. ....		19	66	405	174	1,930	78	70	22
12. ....		22	270	296	174	2,860	74	82	17
13. ....		22	716	209	163	1,520	63	46	15
14. ....		26	1,440	163	142	1,040	63	29	14
15. ....		19	1,490	132	113	1,140	132	19	14
16. ....	10	18	810	528	108	885	86	18	12
17. ....	10	22	596	614	90	390	118	17	14
18. ....	10	20	560	1,010	78	296	78	18	14
19. ....	10	20	496	1,110	1,630	221	63	20	13
20. ....	10	19	405	3,400	762	197	100	21	11
21. ....	10	18	296	6,350	376	614	56	16	74
22. ....	10	19	221	6,350	245	960	63	14	1,470
23. ....	13	26	185	4,500	163	960	41	12	1,520
24. ....	14	28	174	3,070	127	786	35	12	3,040
25. ....	19	31	152	1,680	118	528	30	14	1,850
26. ....	19	34	132	1,820	95	405	49	12	2,560
27. ....	20	31	127	1,440	82	560	37	13	2,220
28. ....	20	28	180	985	60	174	29	15	1,680
29. ....	26	-----	233	614	1,570	132	24	17	1,660
30. ....	31	-----	465	496	5,380	104	20	14	1,240
31. ....	33	-----	1,080	-----	4,560	-----	19	13	-----

Discharge, in second-feet, of Chariton River at Novinger, Mo., 1931-32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1.....	560	652	6,990	5,920	496	528	496	322	2'5	221	1,420	1,080
2.....	296	435	5,150	6,350	465	596	405	283	270	118	4,960	426
3.....	185	348	2,300	5,380	390	578	335	245	465	174	4,140	362
4.....	127	283	1,160	4,710	318	596	283	221	1,180	496	1,260	317
5.....	100	257	935	4,640	245	544	257	209	1,900	596	860	228
6.....	86	221	810	7,160	322	480	233	185	1,200	450	480	166
7.....	3,620	197	739	7,520	309	465	233	560	672	910	1,210	134
8.....	4,180	185	672	6,820	335	390	221	1,790	2,070	348	3,820	110
9.....	3,040	163	632	5,150	362	309	1,060	2,160	1,790	197	1,010	101
10.....	2,500	163	935	2,360	390	296	716	2,270	652	405	716	106
11.....	3,220	152	3,160	1,060	544	296	578	2,130	322	335	390	242
12.....	3,500	1,550	3,470	1,040	910	270	560	1,110	260	152	652	1,060
13.....	3,440	2,830	2,950	1,630	860	233	362	560	174	113	739	1,010
14.....	4,140	3,690	3,220	2,070	885	174	245	405	435	86	3,370	569
15.....	3,500	7,160	2,860	2,130	672	209	209	309	309	70	7,710	347
16.....	3,040	7,340	2,390	2,100	544	221	185	257	1,080	63	11,600	257
17.....	2,680	7,340	1,740	1,850	1,010	283	197	221	1,280	56	13,700	173
18.....	1,210	7,710	1,340	1,600	1,080	296	283	197	596	52	13,100	443
19.....	614	7,160	1,310	1,360	835	348	221	197	276	37	10,100	116
20.....	450	6,660	1,420	1,110	885	362	221	197	348	33	7,710	97
21.....	348	6,820	1,470	1,060	694	362	2,770	174	512	32	5,920	89
22.....	283	7,900	1,420	1,210	596	283	2,480	174	322	29	3,910	77
23.....	270	12,100	1,210	1,470	544	283	1,680	152	197	27	3,010	186
24.....	362	15,400	1,060	1,390	496	450	1,630	122	142	26	1,490	228
25.....	322	12,900	835	935	450	2,710	1,210	108	118	24	650	140
26.....	296	10,100	694	672	420	2,950	935	100	104	376	1,210	97
27.....	362	8,300	596	560	420	2,770	694	86	322	113	1,680	74
28.....	1,600	7,710	544	596	435	2,500	578	82	2,300	52	2,010	60
29.....	2,040	7,900	496	560	496	1,990	496	70	1,660	31	1,990	49
30.....	2,010	7,900	496	544	-----	1,180	390	66	435	24	835	46
31.....	1,520	-----	2,830	480	-----	716	-----	174	-----	22	378	-----

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
1931						
January 16-31.....	33	10	16.6	0.012	0.007	527
February.....	34	18	24.3	.018	.02	1,350
March.....	1,490	17	333	.243	.28	20,500
April.....	6,350	132	1,540	1.12	1.25	91,600
May.....	5,380	60	592	.432	.50	36,400
June.....	6,660	104	1,580	1.15	1.28	94,000
July.....	152	19	69.3	.051	.06	4,260
August.....	86	12	26.3	.019	.02	1,620
September.....	3,040	11	630	.460	.51	37,500
The period.....	-----	-----	-----	-----	-----	288,000
1931-32						
October.....	4,180	86	1,610	1.18	1.36	99,000
November.....	15,400	152	5,050	3.69	4.12	300,000
December.....	6,990	496	1,800	1.31	1.51	111,000
January.....	7,520	480	2,630	1.92	2.21	162,000
February.....	1,080	245	566	.413	.45	32,600
March.....	2,950	174	763	.557	.64	46,900
April.....	2,770	185	672	.491	.55	40,000
May.....	2,270	66	488	.356	.41	30,000
June.....	2,300	104	722	.527	.59	43,000
July.....	910	22	183	.134	.15	11,300
August.....	13,700	378	3,610	2.64	3.04	222,000
September.....	1,080	46	280	.204	.23	16,700
The year.....	15,400	22	1,530	1.12	15.26	1,110,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 17,500 second-feet Nov. 27, Aug. 20, 21; maximum gage height, 21.47 feet Aug. 20; minimum discharge, 87 second-feet July 22, 25.

1929-32: Maximum discharge, 18,700 second-feet Apr. 25, 1929 (gage height, 21.66 feet); minimum discharge, 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 Feb. 2, 3, Mar. 9, 11-13.

*Discharge, in second-feet, 1930-31*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,450	1,700	9,500	7,140	700	572	1,070	572	115	952	94	756
2	940	1,060	8,760	7,260	674	622	756	476	548	476	4,080	784
3	528	658	7,400	7,020	622	728	622	404	700	290	4,600	840
4	346	504	4,660	6,800	596	728	524	356	868	230	4,480	548
5	262	412	2,310	6,600	548	700	452	312	812	648	3,070	500
6	214	346	1,550	8,460	596	728	404	290	1,380	1,310	1,280	428
7	176	324	1,280	8,460	572	674	380	270	1,510	784	868	356
8	1,640	282	1,130	8,020	476	572	380	476	924	1,010	3,300	312
9	3,680	262	1,070	7,680	428	500	380	1,580	1,550	700	3,600	290
10	3,270	252	1,190	6,800	500	404	622	2,350	1,550	404	2,070	250
11	2,120	242	1,870	4,360	648	404	980	2,150	1,160	500	1,070	240
12	3,190	1,180	4,140	2,030	1,620	380	700	1,870	548	500	1,440	220
13	3,630	2,480	4,420	1,720	1,100	356	674	1,480	524	356	3,250	476
14	4,960	2,780	4,720	2,190	1,040	334	572	840	270	240	1,190	1,040
15	4,660	3,900	4,300	2,440	1,010	356	404	572	312	180	4,300	840
16	4,100	5,820	3,600	2,400	952	312	334	428	476	151	6,900	524
17	3,230	6,520	2,940	2,440	980	312	312	334	334	124	8,460	380
18	2,700	8,020	2,270	2,350	1,380	380	290	290	1,160	108	11,500	334
19	1,800	7,540	1,720	1,990	1,440	428	380	250	1,130	100	14,500	1,160
20	1,030	8,220	1,550	1,690	1,100	476	356	230	524	94	16,900	728
21	742	8,020	1,620	1,440	1,010	500	380	220	1,130	94	19,900	312
22	553	8,020	1,690	1,350	952	500	4,190	220	404	87	11,500	230
23	480	9,100	1,650	1,440	784	500	3,860	190	476	100	7,400	200
24	412	11,000	1,480	1,580	728	622	2,270	180	312	115	5,140	170
25	467	13,000	1,280	1,580	674	980	1,870	170	210	87	2,980	240
26	480	14,500	1,100	1,280	622	2,980	1,620	151	160	94	1,440	290
27	434	16,900	952	1,130	572	3,300	1,160	132	500	596	1,310	250
28	434	16,300	840	840	548	3,020	952	115	428	700	1,690	190
29	1,090	13,000	756	812	548	2,660	756	100	524	290	1,950	170
30	1,800	11,000	700	756	-----	2,270	674	94	2,150	151	1,990	142
31	1,870	-----	784	728	-----	1,580	-----	87	-----	100	1,280	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	4,960	176	1,700	0.872	1.01	105,000
November	16,900	242	5,780	2.96	3.30	344,000
December	9,500	700	2,680	1.37	1.58	165,000
January	8,460	728	3,570	1.83	2.11	220,000
February	1,620	428	808	.414	.45	46,500
March	3,300	312	932	.478	.55	57,300
April	4,190	290	944	.484	.54	56,200
May	2,350	87	554	.284	.33	34,100
June	2,150	115	756	.388	.43	45,000
July	1,310	87	373	.191	.22	22,900
August	16,900	94	4,860	2.49	2.87	299,000
September	1,160	142	440	.226	.25	26,200
The year	16,900	87	1,960	1.01	13.64	1,420,000

## LAMINE RIVER BASIN

## LAMINE RIVER AT CLIFTON CITY, MO.

LOCATION.—Chain gage in NW¼ sec. 16, T. 46 N., R. 19 W., 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 1932.

EXTREMES.—Maximum discharge during year, 11,200 second-feet Nov. 23 (gage height, 21.65 feet); minimum, 3.2 second-feet July 25 (gage height, 1.38 feet). 1922-32: Maximum discharge, 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).

Maximum stage known, 35.3 feet Sept. 18, 1905.

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	62	22	354	3,420	127	86	36	41	19	15	25	181
2.....	55	21	288	800	118	86	33	39	16	13	19	405
3.....	47	21	227	440	127	90	31	36	22	13	16	160
4.....	41	21	198	371	122	90	31	33	22	11	13	93
5.....	34	21	176	1,080	113	118	27	29	90	55	10	56
6.....	30	20	150	3,500	104	162	25	27	55	70	9	37
7.....	30	20	134	1,440	104	147	23	27	39	184	3,690	28
8.....	28	20	125	475	104	127	29	23	31	104	650	21
9.....	24	18	212	354	95	99	29	27	25	66	176	16
10.....	30	20	510	272	95	78	29	23	22	39	93	14
11.....	49	22	304	242	242	74	27	23	27	27	60	14
12.....	227	21	257	227	615	74	27	20	152	19	37	12
13.....	2,020	18	257	242	212	66	25	19	86	15	68	18
14.....	1,040	60	212	304	168	62	23	17	47	13	720	14
15.....	337	56	198	227	173	62	23	17	47	10	800	37
16.....	198	68	154	184	242	66	25	16	28	8	176	84
17.....	150	93	140	198	580	70	27	15	23	6	198	320
18.....	115	80	130	288	440	70	29	14	19	6	212	101
19.....	88	88	115	212	288	74	31	14	17	3.6	181	49
20.....	76	115	106	173	212	70	44	13	580	4.6	88	30
21.....	60	84	106	152	198	66	49	12	1,120	3.6	97	20
22.....	53	5,040	110	147	179	66	62	12	212	5.0	32	16
23.....	43	8,700	125	184	157	66	66	11	113	4.0	24	12
24.....	37	5,340	120	257	142	66	62	10	78	3.6	20	10
25.....	34	1,760	97	242	127	62	70	11	51	3.2	17	9
26.....	32	580	80	272	113	55	74	14	36	70	2,290	8
27.....	30	580	76	337	104	51	70	13	31	212	1,840	49
28.....	26	920	68	422	99	51	62	22	25	179	272	32
29.....	26	650	68	320	90	47	58	19	20	95	227	60
30.....	22	475	64	227	-----	41	51	17	17	58	125	56
31.....	22	-----	880	162	-----	39	-----	19	-----	36	181	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	2,020	22	163	0.273	0.31	10,000
November.....	8,700	18	832	1.39	1.55	49,500
December.....	880	64	195	.326	.38	12,000
January.....	3,500	147	554	.926	1.07	34,100
February.....	615	90	189	.316	.34	10,900
March.....	162	39	76.8	.128	.15	4,720
April.....	74	23	39.9	.067	.07	2,370
May.....	41	10	20.4	.034	.04	1,250
June.....	1,120	16	102	.171	.19	6,070
July.....	212	3.2	43.6	.073	.08	2,680
August.....	3,600	9	396	.662	.76	24,800
September.....	405	8	65.4	.109	.12	3,890
The year.....	8,700	3.2	223	.373	5.06	162,000

## OSAGE (MARAI DES CYGNES) RIVER BASIN

## OSAGE RIVER NEAR QUENEMO, KANS.

LOCATION.—Chain gage in NW¼ sec. 7, T. 17 S., R. 18 E., 2½ mile below Dragoon Creek and 3 miles east of Quenemo.

DRAINAGE.—1,030 square miles.

RECORDS AVAILABLE.—June 1922 to September 1932.

EXTREMES.—Maximum discharge during year, 20,600 second-feet July 6 (gage height, 35.18 feet); no flow Nov. 9 (gage height, 2.35 feet).

1922-32: Maximum discharge, 32,600 second-feet Nov. 17, 1928 (gage height, 38.38 feet); no flow in July and August 1926, September and November 1931.

Bank-full stage, 27 feet.

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3.0	0.3	496	141	100	93	93	187	22	282	58	19
2.....	2	.4	301	122	80	93	83	168	24	616	50	29
3.....	2	.3	282	132	86	86	76	225	28	216	49	24
4.....	1	.3	320	141	93	100	69	282	26	889	42	21
5.....	3	.3	282	216	86	122	66	225	22	7,540	35	8
6.....	2	.2	263	320	80	159	66	178	18	18,900	33	9
7.....	2	.2	244	282	93	132	100	700	15	12,500	36	8
8.....	1	.1	244	263	100	116	100	556	18	8,040	34	8
9.....	.7	0	358	225	100	83	93	358	263	2,970	31	8
10.....	.6	0	576	196	93	60	83	244	1,820	997	29	6
11.....	.6	.1	700	159	116	52	76	206	516	396	26	6
12.....	.8	.3	826	178	100	46	73	150	225	320	22	4
13.....	.9	1	700	206	93	45	66	108	93	282	19	4
14.....	.9	40	476	187	86	52	63	85	596	225	17	4
15.....	1	2,780	396	168	93	66	69	78	263	178	16	3
16.....	.8	2,280	476	141	122	79	79	68	100	150	14	2
17.....	.7	1,550	377	187	178	93	556	64	73	122	14	2
18.....	.8	7,590	263	206	244	83	847	82	52	122	12	2
19.....	1	4,120	320	216	206	108	320	68	1,060	116	10	2
20.....	2	496	244	216	178	93	556	60	7,640	100	9	2
21.....	3	339	244	187	159	116	1,400	55	9,860	86	8	1
22.....	2	1,020	225	168	168	141	436	39	5,670	75	8	8
23.....	2	8,890	216	150	159	225	436	31	1,270	64	6	5
24.....	3	17,200	206	150	150	377	516	22	282	62	6	4
25.....	3	10,400	187	141	132	496	436	18	225	59	6	3
26.....	1	4,800	168	132	116	576	358	22	263	47	10	3
27.....	.9	953	159	141	108	456	282	27	1,430	35	12	5
28.....	.6	910	141	141	116	216	244	22	4,160	26	11	10
29.....	.4	556	132	122	100	168	216	20	1,430	39	8	26
30.....	.4	516	141	116	-----	132	196	23	282	59	8	30
31.....	.5	-----	150	108	-----	108	-----	22	-----	82	10	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	3	0.4	1.41	86.5
November.....	17,200	0	2,150	128,000
December.....	826	132	326	20,100
January.....	320	108	176	10,800
February.....	244	80	122	7,010
March.....	576	45	154	9,470
April.....	1,400	63	268	16,000
May.....	700	18	142	8,710
June.....	9,860	15	1,260	74,900
July.....	18,900	26	1,790	110,000
August.....	58	6	20.9	1,290
September.....	30	1	8.87	528
The year.....	18,900	0	533	387,000

## 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 1932. August 1902 to October 1905 at Main Street Bridge, at Ottawa.

EXTREMES.—Maximum discharge during year, 14,800 second-feet Nov. 25 (gage height, 29.67 feet); no flow several days in October; minimum gage height, 1.18 feet on Oct. 12.

1918-32: Maximum discharge, 58,400 second-feet Nov. 17, 1928 (gage height, 38.65 feet); no flow at times in 1920, 1930, 1931. Bank-full stage, 27 feet.

REMARKS.—Records good except those for October, November, and May to September and those for period of ice effect, Jan. 27 to Feb. 7, which are fair. Discharge interpolated Nov. 19.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2	1	638	177	110	120	134	209	41	317	85	14
2	1	1	532	167		113	116	191	42	622	75	12
3	1	1	458	159		110	107	196	42	374	64	12
4	1	1	430	159		113	96	388	40	700	57	22
5	1	1	416	216		115	90	346	35	6,210	50	23
6	1	1	416	154	120	127	84	228	37	12,700	50	15
7	1	2	388	532		125	91	732	32	13,600	62	15
8	0	2	360	416		116	94	380	30	13,900	84	13
9	0	2	488	257		108	100		100	8,680	81	12
10	0	6	748	221		99	94		2,490	1,690	58	10
11	1	6	833	198	146	85	85	125	1,260	638	47	8
12	0	4	952	187	148	74	79		592	444	37	10
13	1	6	884	211	135	68	75		264	333	34	8
14		294	622	250	127	72	67		478	264	30	7
15		1,330	592	240	123	75	62		577	216	29	7
16		2,490	416	209	143	81	105	92	225	175	25	5
17	1	3,170	346	191	191	94	333	86	122	148	27	5
18		5,280	333	240	307	102	986		85	128	25	5
19		5,660	325	264	307	110	547		918	118	22	6
20		1,300	312	250	264	113	607		8,210	97	21	6
21		473	304	233	211	130	1,480	88	8,320	82	20	10
22	1	1,730	294	219	196	159	765	74	7,560	86	18	9
23	1	8,210	280	214	196	346	430	53	2,610	68	17	10
24	1	13,200	259	202	191	684	473	46	473	61	16	13
25	1	14,000	240	177	175	716	547	50	323	60	16	11
26	1	12,700	209	156	163	748	458	54	323	69	23	10
27	1	4,100	191		148	562	360	49	1,370	68	21	15
28	1	1,300	183		135	360	287	43	3,170	49	19	18
29	1	1,020	177		127	259	257	43	2,160	47	17	12
30	1	809	179		100	193	235	44	485	52	16	16
31	1	177	177			158	158	41	41	84	18	18

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2	0	0.9	56
November	14,000	1	2,570	153,000
December	952	177	419	25,700
January	532		206	12,700
February	307		158	9,080
March	748	68	204	12,600
April	1,480	62	308	18,300
May	732	41	188	11,600
June	8,320	30	1,410	84,100
July	13,900	47	2,000	123,000
August	85	16	37.5	2,310
September	23	5	11.3	672
The year	14,000	0	624	453,000



## 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 1932.

EXTREMES.—Maximum discharge during year, 19,000 second-feet May 20 (gage height, 25.52 feet); minimum, 0.1 second-foot Nov. 6-9 (gage height, 0.64 foot).

1921-23; 1928-32: Maximum discharge, 120,000 second-feet Nov. 18, 1928 (gage height, 34.45 feet); no flow several days in November 1930 and September 1931. Bank-full stage, 24 feet.

REMARKS.—Records good except those for Oct. 17 to Nov. 15, Aug. 21 to Sept. 30, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	13	0.3	7,080	441	302	353	370	472	109	1,140	72	14
2.....	7	.3	1,590	506	336	330	319	410	117	580	77	13
3.....	4	.3	1,280	472	336	302	291	393	139	688	101	12
4.....	3	.2	1,100	441	330	291	259	382	106	763	95	13
5.....	3	.2	1,020	972	280	291	230	441	104	2,160	77	15
6.....	2	.1	928	2,240	285	313	225	577	88	8,400	72	14
7.....	2	.1	806	2,240	319	302	225	472	74	10,300	90	12
8.....	1	.1	767	1,810	313	291	202	690	72	11,300	70	13
9.....	.7	.1	972	1,190	319	264	202	2,160	477	11,900	60	17
10.....	.7	.3	2,080	845	313	238	216	2,000	615	12,100	70	20
11.....	1	.4	2,240	728	324	220	202	965	3,080	11,200	123	16
12.....	3	.4	2,160	728	410	202	194	763	3,200	6,000	95	13
13.....	6	.6	2,080	767	410	194	190	510	1,620	1,100	85	14
14.....	5	.9	1,910	806	370	187	175	385	1,830	577	72	12
15.....	3	2	1,380	767	441	194	164	314	1,320	410	64	10
16.....	2	1,590	1,190	690	376	194	175	292	1,090	359	75	10
17.....	8	3,080	972	806	577	207	225	256	580	285	80	9
18.....	8	6,600	845	888	1,020	230	382	210	358	254	98	8
19.....	8	7,740	767	928	1,280	230	1,190	185	297	198	95	8
20.....	1	7,580	806	928	888	243	1,190	163	3,980	171	46	7
21.....	.9	4,700	728	806	728	270	1,060	170	10,200	153	18	6
22.....	1	1,280	690	728	652	296	2,000	163	13,300	126	77	13
23.....	1	7,660	652	614	652	382	1,700	145	14,400	109	73	10
24.....	1	12,200	614	540	506	806	1,380	117	12,400	82	28	7
25.....	.9	14,500	577	506	506	1,810	1,100	117	4,220	101	21	8
26.....	.9	15,600	506	540	472	1,700	1,190	106	922	90	19	10
27.....	.8	16,800	472	540	441	1,380	1,020	85	1,420	80	17	26
28.....	.7	18,500	441	506	399	1,100	806	65	2,160	88	15	18
29.....	.6	18,500	441	540	347	767	652	85	3,440	82	16	11
30.....	.4	12,500	404	472	-----	614	540	98	3,080	85	14	10
31.....	.4	-----	410	410	-----	441	-----	90	-----	77	18	-----

Month	Maximum	Minimum	Mean	Run-off in a re-feet
October.....	13	0.4	2.90	179
November.....	18,500	.1	4,960	295,000
December.....	7,080	404	1,220	75,200
January.....	2,240	410	819	50,400
February.....	1,280	280	480	27,000
March.....	1,810	187	472	29,000
April.....	2,000	164	602	35,800
May.....	2,160	65	428	26,300
June.....	14,400	72	2,830	168,000
July.....	12,100	77	2,610	161,000
August.....	123	14	59.8	3,680
September.....	26	6	12.3	732
The year.....	18,500	.1	1,200	873,000

## OSAGE RIVER AT OSCEOLA, MO.

LOCATION.—Water-stage recorder in NE¼NE¼ sec. 17, T. 38 N., R. 25 W., 1 mile northeast of Osceola.

DRAINAGE AREA.—8,220 square miles.

RECORDS AVAILABLE.—November 1930 to September 1932. July 1921 to September 1923 at site 1 mile upstream.

EXTREMES.—Maximum discharge during year, 25,300 second-feet June 30 (gage height, 16.40 feet); minimum, 13 second-feet several short periods Sept. 12–19 (gage height, 0.53 foot).

1921–28, 1930–32: Maximum discharge, 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.

REMARKS.—Records good. Flow regulated by hydroelectric plant of West Missouri Power Co. 1 mile upstream. Discharge July 15–25 computed from records of this plant; estimated Aug. 2, 3.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	196	213	23,100	1,940	3,240	1,720	1,220	1,440	2,240	9,670	443	1,300
2	217	235	21,400	1,940	2,940	1,630	1,560	1,690	6,700	5,970	468	147
3	133	187	16,600	1,940	2,720	1,310	937	1,170	8,220	4,090	307	91
4	307	201	7,460	1,820	2,680	1,510	990	971	4,210	2,930	588	202
5	292	202	4,400	2,330	2,590	1,610	924	850	3,540	3,910	675	248
6	231	196	3,540	4,940	2,270	1,590	850	777	2,290	8,220	354	181
7	183	206	3,380	7,380	2,200	1,460	880	815	1,630	16,800	400	162
8	186	172	2,920	7,190	2,160	1,490	935	1,040	1,330	17,000	335	201
9	196	204	2,770	6,050	2,070	1,360	1,470	1,250	2,110	15,800	506	172
10	159	197	3,070	4,400	1,980	1,220	1,030	1,670	2,520	15,200	569	157
11	436	198	3,700	3,540	2,050	1,180	1,290	2,450	2,430	15,100	479	29
12	845	143	4,530	3,070	2,120	1,100	1,010	2,050	2,850	15,000	417	84
13	2,030	777	4,940	2,770	2,120	827	956	1,520	5,050	13,500	319	104
14	1,800	727	4,220	2,770	2,100	740	892	965	8,830	7,010	478	101
15	1,180	1,350	3,870	2,620	2,090	830	909	859	6,100	2,500	711	99
16	855	1,030	3,380	2,470	2,120	965	841	695	3,930	1,640	850	98
17	880	1,360	2,920	2,920	3,350	997	996	642	2,600	1,600	534	98
18	790	3,030	2,770	4,400	4,900	1,420	1,110	405	1,900	1,130	349	133
19	410	5,990	2,470	4,580	5,330	1,840	1,240	522	1,510	917	357	94
20	500	7,980	2,330	4,220	4,630	1,860	1,750	432	1,930	920	385	111
21	413	8,560	2,330	3,700	3,640	1,720	2,230	405	11,500	856	260	101
22	381	13,200	2,200	3,540	2,980	1,670	2,630	387	18,600	722	308	99
23	342	15,300	2,200	4,790	2,650	1,680	2,920	366	15,500	955	202	99
24	397	18,600	2,070	6,050	2,400	1,460	3,520	322	14,600	743	200	87
25	330	22,500	2,070	5,890	2,240	1,500	3,590	315	14,100	993	188	106
26	327	21,400	1,940	5,120	2,040	2,020	3,630	315	12,700	2,080	173	98
27	280	21,000	1,820	5,480	1,930	2,580	3,170	346	7,390	1,800	170	105
28	225	21,400	1,710	5,300	1,830	2,500	2,710	337	11,400	993	283	139
29	254	21,200	1,600	4,760	1,720	2,220	2,370	488	20,900	955	276	123
30	170	22,400	1,620	4,040	-----	1,910	2,030	392	22,400	837	199	149
31	253	-----	1,610	3,880	-----	1,690	-----	846	-----	554	1,080	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	2,030	133	490	0.060	0.07	30,100
November	22,500	143	7,010	.853	.95	417,000
December	23,100	1,600	4,680	.569	.66	288,000
January	7,380	1,820	4,060	.494	.57	250,000
February	5,330	1,720	2,660	.324	.35	153,000
March	2,580	740	1,540	.187	.22	94,700
April	3,630	841	1,690	.206	.23	101,000
May	2,450	315	862	.105	.12	53,000
June	22,400	1,330	7,370	.897	1.00	439,000
July	17,000	554	5,500	.669	.77	338,000
August	1,080	170	415	.050	.06	25,500
September	1,300	29	164	.020	.02	9,760
The year	23,100	29	3,030	.369	5.02	2,200,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 42,600 second-feet Nov. 27 (gage height, 19.08 feet); minimum, 220 second-feet June 12 (gage height, 2.12 feet). 1925-32: Maximum discharge, 106,000 second-feet Apr. 17, 1927, May 21, 1929; maximum gage height, 36.61 feet Apr. 17, 1927; minimum discharge and gage height, those of June 12, 1932.

Maximum stage known, 43.1 feet in June 1844 (discharge, about 150,000 second-feet).

REMARKS.—Records good. Flow regulated by hydroelectric plant of Union Electric Light & Power Co. 2 miles upstream. Discharge Oct. 1-13, Sept. 23-30 computed from records of this plant.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	400	884	28,100	2,400	14,200	11,700	3,110	644	498	9,580	2,910	2,090
2	700	2,900	27,900	4,830	16,600	11,700	1,690	945	576	7,360	4,050	2,430
3	690	2,450	25,103	2,020	15,400	13,500	1,130	1,250	517	2,410	3,450	2,790
4	315	2,460	19,200	6,400	13,900	11,800	3,860	1,010	505	2,100	3,010	1,170
5	550	2,580	10,700	7,080	16,400	10,100	3,450	639	487	9,210	3,010	1,010
6	1,270	2,490	4,440	6,700	15,000	4,950	3,060	629	519	12,300	1,040	2,520
7	1,400	1,470	8,120	7,780	10,900	11,100	3,750	628	527	12,900	703	2,670
8	480	779	8,610	9,390	14,400	13,700	2,450	569	545	13,700	625	1,430
9	350	2,500	8,740	8,040	14,400	13,300	1,540	668	575	18,100	634	1,650
10	720	2,570	8,800	2,850	13,300	10,700	805	542	558	24,400	655	1,690
11	325	2,390	9,060	8,990	12,600	10,300	2,740	513	558	16,100	667	839
12	2,300	1,610	8,710	11,000	11,800	9,000	3,240	599	497	19,000	906	1,800
13	14,600	1,250	4,630	8,970	10,900	3,630	2,760	565	520	15,400	1,470	1,840
14	15,200	905	8,830	9,220	5,700	9,230	2,150	554	525	14,300	663	1,440
15	9,480	614	10,200	8,230	10,500	9,530	1,660	563	524	14,400	2,160	1,590
16	6,780	792	10,300	7,080	12,300	8,550	1,010	582	532	11,000	2,940	853
17	6,300	829	11,200	4,680	11,900	6,140	636	565	490	3,890	3,500	864
18	4,190	1,790	10,600	8,770	11,200	5,160	1,780	563	536	6,600	3,670	760
19	4,790	1,850	8,780	10,200	9,990	3,040	2,580	578	558	6,960	3,660	1,450
20	4,440	2,180	4,030	10,000	8,390	1,300	2,050	561	566	7,230	1,540	1,650
21	4,570	1,640	10,300	10,600	4,590	7,220	2,340	713	559	7,230	832	940
22	3,420	3,900	10,200	10,800	8,400	5,570	1,480	605	562	6,940	1,220	764
23	2,690	34,500	9,220	9,310	11,300	5,050	1,510	577	526	4,360	1,250	790
24	1,780	38,000	8,210	3,660	11,100	4,890	639	576	546	863	1,460	870
25	998	37,900	3,410	10,200	10,800	3,910	1,560	576	524	3,090	2,160	870
26	3,000	35,300	5,020	12,200	11,700	2,580	2,370	565	499	4,530	1,750	1,090
27	2,830	37,400	3,600	11,000	10,300	1,200	1,420	571	1,160	3,790	2,010	1,250
28	2,380	36,700	9,210	10,200	3,990	4,190	947	526	3,530	3,620	820	950
29	2,460	36,300	8,420	10,400	9,600	4,770	1,450	476	7,960	3,040	1,760	890
30	2,860	25,700	7,510	8,950	-----	5,130	649	477	9,510	1,710	1,800	760
31	1,700	-----	7,000	5,220	-----	4,170	-----	645	-----	727	2,170	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15,200	315	3,350	206,000
November	38,000	614	10,800	643,000
December	28,100	3,410	10,300	633,000
January	12,200	2,020	7,970	490,000
February	16,600	3,990	11,400	656,000
March	13,700	1,200	7,330	451,000
April	3,860	636	2,000	119,000
May	1,250	476	628	38,600
June	9,510	487	1,200	71,400
July	24,400	727	8,610	529,000
August	4,050	625	1,890	116,000
September	2,790	760	1,390	82,700
The year	38,000	315	5,550	4,040,000

## OSAGE RIVER NEAR ST. THOMAS, MO.

LOCATION.—Water-stage recorder in SE¼SW¼ sec. 35, T. 42 N., R. 12 W., half a mile below Sugar Creek and 2½ 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 1932.

EXTREMES.—Maximum discharge during year, 45,300 second-feet Nov. 25 (gage height, 16.90 feet); minimum, 545 second-feet Oct. 6 (gage height, 1.51 feet).

1931-32: Maximum discharge, that of Nov. 25, 1931; minimum, 420 second-feet Aug. 27, 1931 (gage height, 1.30 feet).

Maximum stage known, about 39.7 feet in June 1844.

REMARKS.—Records good. Flow regulated by hydroelectric plant of Union Electric Light & Power Co.

## Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	1,620	1,930	27,100	7,020	10,400	10,600	4,050	1,030	650	11,300	1,090	2,970
2-----	868	1,390	30,500	3,960	16,300	11,800	3,020	837	722	10,600	3,310	3,140
3-----	692	2,770	26,700	5,060	16,000	12,600	1,840	1,040	650	7,580	4,510	2,900
4-----	888	2,560	31,000	4,040	14,600	12,400	1,550	1,320	650	3,250	3,730	3,310
5-----	680	2,600	13,100	8,690	15,900	10,700	3,830	1,140	615	5,020	3,400	1,540
6-----	623	2,720	7,670	9,670	15,900	8,540	3,300	817	615	12,900	3,310	1,250
7-----	1,350	2,690	5,850	8,180	13,000	6,970	3,280	760	615	14,200	1,790	2,690
8-----	1,970	1,820	7,800	9,440	12,400	12,600	3,460	760	615	16,200	1,070	2,970
9-----	1,320	1,270	8,430	8,710	14,600	13,600	2,560	722	615	16,600	730	1,710
10-----	793	2,570	8,710	7,600	13,600	11,600	1,600	685	615	27,000	650	1,730
11-----	1,020	3,100	8,710	4,880	12,800	10,000	1,040	685	650	21,400	685	1,820
12-----	933	2,760	8,820	10,200	12,100	9,770	2,740	615	650	20,200	650	1,120
13-----	9,870	3,890	7,380	10,100	11,000	6,760	3,110	615	615	18,800	895	1,890
14-----	17,100	2,860	6,210	9,400	9,070	5,790	2,640	650	615	15,500	1,910	2,040
15-----	11,600	2,050	9,290	9,150	6,680	9,720	2,170	615	615	15,400	1,820	1,570
16-----	7,370	1,570	10,000	8,390	11,200	8,310	1,750	615	615	14,500	2,390	1,680
17-----	5,750	1,450	10,300	9,380	11,900	7,630	1,210	615	615	9,080	3,530	1,110
18-----	5,040	1,460	10,600	7,300	11,300	5,600	909	580	615	4,960	4,190	923
19-----	4,540	2,270	9,290	10,500	10,400	5,070	1,850	580	615	7,040	4,270	860
20-----	4,380	2,370	6,060	10,700	8,880	3,280	2,630	580	1,090	7,550	4,000	1,330
21-----	4,240	2,540	6,740	10,800	7,120	2,640	2,370	615	1,750	7,980	1,880	1,690
22-----	4,050	2,090	9,210	11,600	5,500	7,100	2,330	650	1,270	7,810	1,110	1,150
23-----	3,420	25,600	9,290	11,700	9,800	5,520	1,710	722	920	6,580	1,270	794
24-----	2,910	42,500	8,650	8,820	10,900	5,090	1,660	650	800	4,470	1,240	820
25-----	2,030	42,500	7,070	6,800	10,600	4,650	989	615	722	1,410	1,540	843
26-----	1,480	37,800	3,560	12,500	10,800	3,640	1,890	615	722	3,570	3,070	890
27-----	2,890	41,500	4,940	12,700	11,600	2,760	2,410	650	2,290	4,570	2,410	1,120
28-----	2,840	39,600	5,760	11,600	7,130	1,840	1,540	615	2,020	4,170	2,480	1,290
29-----	2,550	41,000	8,510	11,100	5,690	4,380	1,190	615	5,370	4,070	1,350	1,000
30-----	2,600	33,500	7,790	10,100	-----	4,580	1,670	580	10,800	3,350	1,780	903
31-----	2,900	-----	9,290	7,420	-----	4,890	-----	580	-----	1,900	2,430	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	17,100	623	3,560	219,000
November-----	42,500	1,270	11,800	702,000
December-----	31,000	3,560	10,800	664,000
January-----	12,700	3,960	8,950	550,000
February-----	16,300	5,500	11,300	650,000
March-----	13,600	1,840	7,430	457,000
April-----	4,050	909	2,210	132,000
May-----	1,320	580	715	44,000
June-----	10,800	615	1,320	78,600
July-----	27,000	1,410	9,970	613,000
August-----	4,510	650	2,210	136,000
September-----	3,310	794	1,640	97,600
The year-----	42,500	580	5,980	4,340,000

## POTTAWATOMIE CREEK AT LANE, KANS.

LOCATION.—Chain gage in NW¼ sec. 34, T. 18 S., R. 21 E., at Lane, Franklin County, 16 miles above mouth.

DRAINAGE AREA.—513 square miles.

RECORDS AVAILABLE.—April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 7,070 second-feet Nov. 25 (gage height, 25.25 feet, affected by backwater from Osage River); minimum, 0.1 second-foot Oct. 1.

1929-32: Maximum discharge, 7,520 second-feet Apr. 22, 1929 (gage height, 22.40 feet); no flow during July 1930 and September 1931. Bank-full stage, 22 feet.

Maximum stage known, 33 feet in November 1928.

REMARKS.—Records good except those for Nov. 17, 18, 23-25, May 10 to June 10, June 20, 21, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	0.1	0.3	340	57	50	64	50	72	6
2.....	1	.3	268	61	43	59	46	64	7
3.....	1	.4	204	52	43	55	40	59	6
4.....	1	.4	170	63	43	57	43	55	5
5.....	.9	.4	151	268	46	64	37	53	3
6.....	.8	.3	118	1,010	48	66	38	50	3
7.....	.7	.2	102	574	43	55	41	52	5
8.....	.6	.4	102	353	38	52	38	48	7
9.....	.6	.4	322	180	41	50	35	46	137
10.....	.6	.8	646	140	43	43	38	286	430
11.....	.8	1	574	137	52	37	45	108	574
12.....	.9	.8	502	123	68	33	37	72	538
13.....	.9	2	358	131	74	29	37	59	204
14.....	.8	5	250	126	98	29	34	40	105
15.....	.8	13	198	102	74	32	35	38	184
16.....	.9	394	151	108	87	35	38	38	131
17.....	1	1,260	137	151	538	30	63	26	46
18.....	.8	2,970	134	250	646	33	64	25	33
19.....	.8	646	120	304	304	38	123	21	970
20.....	.8	1,610	112	161	194	35	140	18	4,190
21.....	.8	93	105	131	167	46	177	16	4,190
22.....	.6	2,100	95	123	140	68	170	13	790
23.....	.8	6,340	89	112	128	145	177	10	268
24.....	.8	6,510	87	93	112	340	180	8	154
25.....	.8	6,600	74	64	110	322	236	6	110
26.....	.5	3,130	68	74	91	194	222	6	394
27.....	.6	1,380	64	89	78	128	137	6	682
28.....	.6	898	61	89	72	118	110	6	538
29.....	.5	646	57	80	70	91	93	7	112
30.....	.6	538	52	76	-----	72	84	7	74
31.....	.6	-----	53	52	-----	61	-----	7	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1	0.1	.74	46
November.....	6,600	.2	1,170	69,700
December.....	646	52	186	11,400
January.....	1,010	52	172	10,600
February.....	646	38	122	7,020
March.....	340	29	80.0	4,920
April.....	236	34	86.9	5,170
May.....	466	6	56.2	3,460
June.....	4,190	3	497	29,500
The period.....				142,000

## BIG BULL CREEK AT PAOLA, KANS.

LOCATION.—Chain gage in NW¼ sec. 17, T. 17 S., R. 23 E., at west edge of Paola, Miami County, 8 miles above mouth.

DRAINAGE AREA.—223 square miles.

RECORDS AVAILABLE.—April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 7,660 second-feet Nov. 24 (gage height, 22.50 feet); no flow Oct. 1 to Nov. 14.

1929-32: Maximum stage, 22.12 feet June 23, 1929 (discharge not determined); no flow for several months each year. Bank-full stage, about 18 feet.

Maximum stage known, 32.03 feet Nov. 17, 1928.

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	118	48	14	12	19	7	0.5
2	0	73	36	21	10	12	6	.5
3	0	53	30	14	16	8	6	.5
4	0	36	51	12	15	7	4	.5
5	0	26	784	12	21	6	4	.5
6	0	36	408	19	21	4	4	.5
7	0	33	91	29	25	5	73	.5
8	0	30	75	46	30	2	384	57
9	0	578	59	40	27	1	198	338
10	0	275	48	27	29	.7	111	479
11	0	431	48	46	27	.8	50	68
12	0	201	85	34	22	3	16	40
13	0	108	105	32	21	3	7	73
14	0	85	77	34	21	2	5	80
15	604	46	55	40	8	3	4	55
16	18	82	46	42	10	4	6	20
17	1,520	66	118	57	11	12	4	15
18	316	53	114	51	11	9	4	29
19	46	46	94	48	8	8	4	80
20	29	55	64	48	21	11	2	3,410
21	22	53	70	44	26	36	1	170
22	1,830	48	51	37	32	40	1	100
23	3,240	51	42	32	124	39	.8	73
24	3,280	42	39	29	384	30	.6	53
25	} a 500	36	34	25	158	19	.5	134
26		30	51	21	114	16	.5	629
27		25	55	19	51	11	.8	361
28		22	70	16	44	12	.7	50
29	137	25	70	16	42	9	.6	33
30	131	25	51		40	8	.5	25
31		30	34		32		.5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	3,280	0	434	25,800
December	578	22	90.9	5,590
January	784	30	96.9	5,960
February	57	12	31.2	1,800
March	384	8	45.6	2,800
April	40	.7	11.4	675
May	384	.5	29.2	1,800
June	3,410	.5	213	12,600
The period				57,100

NOTE.—No flow during October.

## BIG SUGAR CREEK AT FARLINVILLE, KANS.

LOCATION.—Chain gage in NW¼ sec. 11, T. 21 S., R. 23 E., at Farlinville, Linn County, about 14 miles above mouth.

DRAINAGE AREA.—192 square miles.

RECORDS AVAILABLE.—February 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 3,200 second-feet May 19 (gage height, 19.09 feet); no flow Oct. 1 to Nov. 16.

1929-32: Maximum discharge, 7,490 second-feet May 18, 1929 (gage height, 24.14 feet); no flow during several months in 1930 and 1931. Bank-full stage is about 25 feet.

Maximum stage known, 31.9 feet in November 1928.

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	108	20	19	24	12	23	1
2	0	80	22	16	23	10	22	1
3	0	70	18	20	21	10	19	1
4	0	67	59	22	19	10	20	.8
5	0	60	315	21	42	9	1 <sup>3</sup>	.8
6	0	51	227	20	29	8	1 <sup>5</sup>	.6
7	0	42	115	20	23	10	14	.6
8	0	40	81	21	20	16	14	.5
9	0	213	65	20	17	14	79	.6
10	0	185	54	22	12	10	42	19
11	0	129	50	29	11	10	21	49
12	0	108	77	33	10	11	1 <sup>5</sup>	14
13	0	84	69	30	9	10	9	7
14	0	76	51	24	9	9	9	5
15	0	60	41	26	10	9	8	3
16	0	51	43	185	13	9	8	2
17	270	51	81	510	16	16	7	1
18	129	47	143	143	16	23	6	.9
19	30	43	108	108	16	45	5	51
20	13	41	67	87	17	73	3	790
21	7	41	63	74	18	122	3	185
22	490	37	55	67	20	73	2	76
23	850	32	49	58	7	69	2	43
24	1,610	27	38	51	8	143	2	58
25	255	23	30	47	37	87	1	38
26	136	20	43	41	28	60	2	14
27	285	20	84	30	22	43	.9	22
28	213	19	62	27	20	36	.8	16
29	157	18	46	23	18	24	.8	13
30	136	18	34	-----	15	22	.6	10
31	-----	18	20	-----	13	-----	.6	-----

Day	Maximum	Minimum	Mean	Run-off in acre-feet
November	1,610	0	153	9,090
December	213	18	60.6	3,730
January	315	18	71.9	4,420
February	510	16	61.9	3,560
March	42	7	18.2	1,120
April	143	8	33.4	1,990
May	79	.6	12.1	743
June	790	.5	47.5	2,820
The period	-----	-----	-----	27,500

NOTE.—No flow during October.

## LITTLE OSAGE RIVER AT STOTESBURY, MO.

LOCATION.—Chain gage in NE¼ sec. 21, T. 37 N., R. 33 W., at county highway bridge half a mile north of Stotesbury.

DRAINAGE AREA.—427 square miles.

RECORDS AVAILABLE.—April 1929 to June 1932 (discontinued).

EXTREMES.—Maximum discharge during period October to June, 3,780 second-feet Nov. 24 (gage height, 21.68 feet); no flow Oct. 1-27, 31, Nov. 1-10.

1929-32: Maximum discharge, 13,600 second-feet May 13, 1929; no flow many days during 1930 and 1931.

Maximum stage known, 30.7 feet Oct. 4, 1927 (discharge, about 21,000 second-feet).

REMARKS.—Records poor.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	0	0	201	6	54	71	15	60	27
2.....	0	0	149	5	23	64	12	50	17
3.....	0	0	117	5	28	60	11	39	14
4.....	0	0	93	5	38	54	11	35	11
5.....	0	0	74	12	30	74	10	32	14
6.....	0	0	68	165	25	78	9	28	12
7.....	0	0	57	309	22	64	11	24	8
8.....	0	0	46	183	21	54	11	25	4.4
9.....	0	0	54	117	20	39	10	26	31
10.....	0	0	246	74	18	34	14	24	16
11.....	0	.1	273	60	21	32	12	25	33
12.....	0	.1	183	60	228	34	11	24	50
13.....	0	.2	149	68	109	28	11	22	46
14.....	0	.2	125	74	64	27	11	20	25
15.....	0	.3	93	71	54	28	10	16	35
16.....	0	.3	68	46	125	2°	12	14	13
17.....	0	3.2	60	183	1,090	31	15	14	9
18.....	0	920	54	300	650	32	21	13	6
19.....	0	398	50	237	328	30	93	11	57
20.....	0	125	42	149	338	32	101	11	46
21.....	0	60	36	117	201	28	201	9	133
22.....	0	117	36	117	183	28	165	8	29
23.....	0	1,510	32	117	157	27	109	8	17
24.....	0	3,380	23	101	141	26	300	7	17
25.....	0	2,200	20	82	117	24	264	6	31
26.....	0	526	17	71	109	22	165	7	14
27.....	0	309	14	165	93	21	109	3.3	770
28.....	.5	388	11	141	82	1°	85	3.3	101
29.....	.3	309	9	117	74	19	71	2.6	22
30.....	.1	246	6	82	-----	18	71	2.3	13
31.....	0	-----	8	57	-----	15	-----	3.7	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	0.5	0	0.03	0.0001	0.0001	1.8
November.....	3,380	0	350	.820	.91	20,800
December.....	273	6	77.9	.182	.21	4,790
January.....	309	5	106	.248	.29	6,520
February.....	1,090	18	153	.358	.39	8,800
March.....	78	15	36.8	.086	.10	2,260
April.....	300	9	65.0	.152	.17	3,870
May.....	60	2.3	18.5	.043	.05	1,140
June.....	770	4.4	54.0	.126	.14	3,210
The period.....	-----	-----	-----	-----	-----	51,400



## 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 1932.

EXTREMES.—Maximum discharge during year, 5,500 second-feet Nov. 23 (gage height, 27.00 feet); minimum, 0.3 second-foot Sept. 4 (gage height, 2.24 feet).

1921-25, 1929-32: Maximum discharge, 24,400 second-feet (revised) May 12, 1929 (gage height, 37.04 feet); minimum, 0.3 second-foot, occurred this year. Bank-full stage, 34.0 feet.

Maximum stage known, 42.34 feet in 1915.

REMARKS.—Records fair. Discharge interpolated Dec. 14-16. Stage-discharge relation affected by ice Mar. 4-11.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1	1	216	30	71	65	12	44	122	16	1	1
2	1	1	172	28	71	63	11	55	96	9	1	1
3	1	1	128	26	81	59	9	53	64	5	4	.5
4	1	1	122	28	86	55	9	47	76	3	1	.3
5	1	1	86	106	76		9	44	31	4	1	.4
6	1	2	91	384	63		10	39	24	2	1	.4
7	1	2	81	260	65		14	36	17	2	34	.5
8	1	1	81	161	65	40	11	30	76	2	71	.4
9	1	1	194	117	61		11	150	25	1	48	.5
10	2	2	324	96	59		11	150	16	1	21	.4
11	5	3	205	86	57		11	30	11	1	7	.5
12	17	9	172	91	139	32	10	21	56	3	4	1
13	17	5	150	91	150	34	12	16	63	1	2	1
14	10	4	130	86	91	32	14	13	43	1	1	.5
15	5	4	110	71	86	32	12	12	20	1	1	1
16	3	3	95	81	139	35	14	12	14	1	1	1
17	2	32	81	404	872	41	31	8	9	1	1	1
18	2	49	76	282	384	40	31	7	6	1	1	1
19	2	172	66	194	260	40	46	4	10	1	1	1
20	1	81	65	150	194	40	22	3	50	1	1	1
21	1	183	63	134	172	39	139	3	161	1	1	1
22	1	1,120	58	205	150	36	112	2	117	1	1	5
23	1	4,010	53	227	139	32	101	1	58	1	.5	2
24	1	820	49	183	117	31	384	1	39	2	.5	1
25	1	736	44	134	106	31	260	1	34	4	.5	1
26	1	324	39	161	96	29	172	1	96	4	.4	1
27	1	580	35	314	81	32	112	1	424	3	.4	2
28	1	464	33	216	76	27	91	1	91	1	.5	1
29	1	344	31	172	71	19	81	1	57	1	.4	1
30	1	282	34	238		16	71	1	23	1	.5	1
31	1		31	91		14		13		2	.5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	17	1	2.8	171
November	4,010	1	308	18,300
December	324	31	100	6,180
January	404	26	156	9,610
February	872	57	141	8,090
March	65	14	37.2	2,290
April	384	9	61.1	3,640
May	150	1	25.8	1,590
June	424	6	64.3	3,830
July	16	1	2.5	155
August	71	.4	6.75	415
September	5	.3	10.1	603
The year	4,010	.3	75.6	54,900

## 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 1932.

EXTREMES.—Maximum discharge during year, 30,700 second-feet June 28 (gage height, 24.00 feet); minimum, 64 second-feet Sept. 29, 30 (gage height, 2.20 feet).

1921-32: Maximum discharge, 34,800 second-feet Apr. 1, 1927 (gage height, 24.95 feet); minimum, 25 second-feet Sept. 10, 1925 (gage height, 1.62 feet).

Maximum stage known, 29.3 feet in July 1909.

REMARKS.—Records good. Discharge estimated Oct. 7, Dec. 23, July 28.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	114	114	2,260	710	1,290	428	532	710	4,300	2,620	511	143
2	114	114	1,850	618	1,230	428	448	710	7,370	3,100	448	182
3	114	103	1,620	575	1,180	408	448	270	2,200	1,850	428	210
4	110	103	1,400	554	1,070	408	428	270	1,970	1,740	408	157
5	107	100	1,290	618	1,020	448	408	270	1,180	3,360	353	126
6	100	100	1,070	3,100	910	448	408	254	853	9,840	353	114
7	96	100	962	2,080	858	448	428	239	753	8,140	408	103
8	93	100	910	1,740	858	428	758	224	554	5,420	389	100
9	90	100	962	1,450	758	408	710	224	753	2,560	353	96
10	96	100	1,070	1,230	758	389	663	210	910	1,970	303	96
11	155	118	962	1,180	758	370	575	224	753	1,560	286	96
12	575	110	910	1,070	758	370	511	196	710	1,340	254	96
13	575	210	858	1,020	710	353	490	182	460	1,180	210	86
14	575	808	858	858	663	353	448	182	1,850	1,120	575	86
15	532	663	808	808	618	353	448	182	1,290	1,020	808	86
16	408	575	758	858	618	353	428	157	663	910	286	86
17	320	554	663	2,860	962	618	428	157	511	808	254	83
18	254	490	663	2,260	758	910	448	148	403	758	254	88
19	239	448	618	1,790	663	962	428	143	370	710	210	85
20	210	408	618	1,560	618	858	428	139	2,740	710	182	68
21	182	370	618	1,560	618	808	428	136	5,050	663	182	74
22	170	858	575	1,910	575	758	408	128	1,850	618	157	68
23	170	2,140	575	2,920	554	710	408	124	1,180	618	157	71
24	170	4,220	554	3,170	532	618	469	124	803	575	170	82
25	143	3,650	511	2,500	511	618	448	124	753	1,340	148	82
26	143	2,980	480	2,440	490	575	408	136	663	710	143	79
27	143	2,260	448	2,620	469	554	389	428	7,280	575	389	76
28	143	2,140	448	2,080	448	532	336	389	25,100	554	210	91
29	130	2,620	448	1,790	448	511	336	254	8,810	532	170	64
30	114	3,300	448	1,680	490	490	336	182	3,650	663	143	64
31	114	-----	575	1,400	448	-----	-----	196	-----	575	134	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	575	90	210	0.181	0.21	12,900
November	4,220	100	999	.861	.96	59,400
December	2,260	448	864	.745	.86	53,100
January	3,170	554	1,650	1.42	1.64	101,000
February	1,290	448	748	.645	.70	43,000
March	962	353	528	.455	.52	32,500
April	758	336	461	.397	.44	27,400
May	710	124	236	.203	.23	14,500
June	25,100	370	2,860	2.47	2.76	170,000
July	9,840	532	1,880	1.62	1.87	116,000
August	808	134	299	.258	.30	18,400
September	210	64	97.9	.084	.09	5,830
The year	25,100	64	901	.777	10.58	654,000

## 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 1932.

EXTREMES.—1927-32: Maximum discharge, about 40,000 second-feet Aug. 8, 1927 (gage height, 36.45 feet); minimum, 5 second-feet Aug. 8, Sept. 3, 1930 (gage height, 1.42 feet).

1921-32: Maximum discharge, that of Aug. 8, 1927; minimum, 1 second-foot Sept. 8-10, 1925.

REMARKS.—Records for 1927-30 fair except those for estimated periods and those above 20,000 second-feet, which are based on extension of rating curve; records good for 1931-32. Stage-discharge relation affected by ice Feb. 7-12, 1929, Jan. 19-21, 1930.

*Discharge, in second-feet, 1926-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1926-27												
1.....	1,150	762	600	504	1,030	294	19,000	504	16,500	382	568	352
2.....	4,160	632	568	472	966	266	3,950	472	16,700	337	412	337
3.....	1,190	536	536	442	898	266	1,940	442	6,660	294	1,790	322
4.....	6,840	472	504	442	830	253	1,370	412	2,550	266	1,110	308
5.....	13,100	442	504	412	728	240	1,070	1,000	1,500	240	728	294
6.....	2,180	412	442	382	664	294	898	2,360	1,000	294	504	294
7.....	1,320	397	568	352	600	472	830	1,690	898	266	412	442
8.....	898	472	2,060	337	568	2,240	8,500	1,370	2,690	227	30,800	294
9.....	762	1,690	1,550	308	504	1,070	4,970	4,020	1,110	214	23,600	280
10.....	8,100	1,000	1,600	280	472	796	8,100	9,310	796	202	2,760	266
11.....	2,760	898	1,030	253	442	664	2,970	1,640	632	190	2,360	253
12.....	1,110	762	864	240	536	696	4,160	1,030	568	214	1,150	240
13.....	932	600	830	1,110	504	664	4,890	830	1,150	352	898	227
14.....	898	2,620	728	4,230	762	600	7,500	762	1,320	568	6,120	214
15.....	864	2,180	664	1,280	898	504	11,700	664	728	762	2,120	214
16.....	830	1,110	568	932	696	442	13,600	536	568	632	1,690	202
17.....	830	898	504	796	632	600	5,530	472	536	536	4,510	202
18.....	796	1,030	442	696	568	1,030	1,840	442	1,550	504	6,030	190
19.....	632	1,030	367	2,760	504	9,420	6,480	412	796	536	2,620	190
20.....	568	898	322	1,110	504	14,600	5,050	382	4,510	696	1,150	190
21.....	536	762	308	864	472	12,200	1,890	352	17,400	3,810	932	190
22.....	536	762	266	762	442	2,360	1,460	412	3,040	4,970	796	178
23.....	442	762	1,150	696	442	1,840	1,110	352	1,460	2,120	1,030	190
24.....	412	696	2,060	664	382	1,280	966	728	1,070	696	762	178
25.....	397	696	1,190	898	352	1,030	898	11,300	864	504	632	190
26.....	382	664	1,000	4,730	337	898	830	2,480	728	382	536	190
27.....	367	664	830	2,180	322	762	728	1,240	600	308	472	190
28.....	367	664	664	2,180	308	664	664	632	536	352	442	190
29.....	382	762	632	3,040	-----	632	600	536	472	294	412	214
30.....	830	632	568	2,060	-----	1,070	536	472	412	2,240	397	1,600
31.....	762	-----	536	1,370	-----	6,300	-----	3,810	-----	864	382	-----

Discharge, in second-feet, of Pomme de Terre River at Hermitage, Mo., 1926-32—  
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1927-28												
1	8,000	253			504	253	397	664	227	920	10,700	115
2	8,600	266			568	294	352	600	308	1,370	13,700	118
3	7,400	504			337	322	504	504	337	1,080	720	122
4	1,500	442			442	382	568	352	190	960	1,320	115
5	898	337		a 700	664	412	5,850	412	536	640	1,370	111
6	632	322			1,550	472	9,970	367	412	500	1,370	91
7	2,620	294			2,000	504	4,300	322	412	308	1,370	82
8	3,180	504		412	1,190	536	2,120	294	1,420	272	1,320	78
9	2,060	2,970		412	898	337	1,110	294	3,950	500	720	76
10	932	1,110		412	762	308	898	308	17,500	570	430	62
11	762	932		412	696	352	796	352	3,670	680	308	78
12	932	696		412	898	442	762	352	1,240	605	250	323
13	796	536		412	1,110	412	728	568	1,200	236	250	1,550
14	696	412		412	1,110	412	1,370	240	960	170	160	308
15	568	1,500		412	1,000	600	932	227	1,040	153	144	104
16	504	5,210	a1,400	442	966	1,550	696	6,750	1,200	124	148	a 75
17	472	1,740		308	796	3,040	568	2,970	1,320	134	168	a 60
18	442	1,190		442	568	3,390	504	1,190	9,750	141	170	a 54
19	412	966		536	442	3,530	472	830	1,850	74	163	a 50
20	382	796		504	308	2,060	568	632	1,600	64	153	a 47
21	352	696		504	367	1,600	4,650	382	1,750	54	338	a 44
22	337	632		830	412	1,110	5,370	504	2,070	62	1,500	a 41
23	322	568		568	382	830	6,210	932	2,690	60	6,480	a 38
24	308	600		472	337	696	4,160	472	1,650	72	5,370	a 35
25	294	536		536	412	664	1,460	337	1,080	66	1,160	a 32
26	294	504		504	367	600	1,280	308	1,000	74	720	a 29
27	280	472		472	337	536	1,460	294	535	93	500	a 26
28	280	442		397	240	442	1,550	294	2,690	100	148	a 24
29	266	382		202	202	382	1,190	240	13,100	54	141	a 22
30	266	6,930		253		442	932	202	2,190	39	127	a 20
31	253			294		504		155		35	113	
1928-29												
1		22	30	236	368	720	880	500	500	196	16	20
2		45	24	264	272	570	1,160	7,110	430	151	14	18
3		20	31	294	264	500	880	6,390	680	132	100	18
4		24	35	338	236	500	640	1,850	430	132	136	14
5		18	41	760	222	640	570	1,460	353	118	78	18
6		20	52	800	222	570	500	12,500	308	113	50	28
7		22	43	800	215	500	430	14,700	430	104	39	28
8		19	39	880	208	430	6,930	3,110	3,530	87	1,200	58
9		48	31	840	200	368	12,500	4,440	1,600	91	1,000	100
10		35	35	4,020	192	323	6,030	1,850	680	104	605	47
11		35	41	1,500	185	294	2,970	1,320	430	605	250	58
12		41	96	960	178	294	1,550	1,550	383	323	1,500	43
13		37	115	680	170	308	1,120	13,900	368	209	338	39
14		39	80	570	236	323	960	8,200	430	136	196	31
15		43	66	398	272	960	1,040	3,670	430	74	136	20
16		35	62	323	383	183	3,880	960	3,600	250	70	109
17		31	70	3,950	368	170	1,850	720	1,750	196	66	91
18		39	74	2,250	430	338	1,080	605	7,400	170	104	74
19		24	68	1,550	605	368	880	570	14,100	151	50	66
20		22	72	1,120	760	308	720	2,690	3,530	165	43	272
21		47	62	338	570	272	640	5,850	1,950	141	35	54
22		56	76	272	500	294	535	2,190	1,200	141	35	50
23		48	70	308	500	353	500	1,160	960	1,550	43	39
24		35	60	323	500	250	430	1,800	880	465	39	41
25		20	54	250	500	368	430	2,310	720	2,830	31	43
26		31	48	294	880	1,650	2,550	1,240	605	920	24	74
27		24	41	209	605	1,200	1,750	920	640	500	20	28
28		22	45	136	570	720	1,200	760	1,650	353	20	37
29		19	48	82	430		920	1,000	880	264	18	33
30		28	39	a 75	368		1,040	500	760	222	19	28
31		24	a 70	338			a 960		570		20	24

a Estimated.

Discharge, in second-feet, of Pomme de Terre River at Hermitage, Mo., 1926-32—  
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1929-30												
1-----	15	800	68	171	264	430	148	1,000	30	60	12	7
2-----	15	535	65	465	272	398	137	605	36	54	11	6
3-----	13	368	49	840	1,370	323	171	294	33	49	9	5
4-----	17	236	62	500	6,930	272	209	209	38	54	12	7
5-----	15	196	60	430	4,440	250	184	196	36	44	11	11
6-----	17	160	58	368	2,490	250	160	184	30	48	8	17
7-----	15	148	58	368	2,550	1,750	124	184	42	40	9	21
8-----	16	126	46	398	1,900	1,080	124	148	33	33	5	86
9-----	29	109	65	430	1,460	920	116	250	38	22	6	640
10-----	17	105	62	398	1,200	570	109	209	33	70	8	236
11-----	23	109	65	338	920	465	103	880	1,200	57	7	308
12-----	62	105	55	1,200	800	368	88	2,000	3,600	38	9	1,200
13-----	800	122	62	2,620	720	323	99	1,200	960	33	7	1,040
14-----	272	105	68	5,290	570	294	88	800	353	14	8	308
15-----	137	105	72	3,810	760	264	92	600	1,370	30	9	1,850
16-----	94	137	75	1,650	430	236	103	500	2,370	18	17	2,190
17-----	82	148	126	1,120	430	222	111	1,850	920	16	7	640
18-----	68	126	171	570	368	222	148	1,280	570	18	8	308
19-----	55	122	196	535	323	209	126	500	383	14	8	196
20-----	55	97	184	500	308	294	99	368	294	12	7	137
21-----	43	113	184	465	272	264	88	209	209	12	72	122
22-----	40	94	171	430	264	196	92	137	160	12	43	97
23-----	34	97	148	338	250	184	96	148	137	12	31	82
24-----	37	101	137	383	272	171	70	137	126	13	23	75
25-----	34	86	126	338	353	184	88	137	111	18	19	68
26-----	29	79	126	323	1,420	196	84	107	99	21	12	62
27-----	29	82	126	272	880	209	99	92	88	26	11	58
28-----	49	79	137	308	570	184	73	63	81	13	10	62
29-----	308	75	118	308	-----	148	107	60	77	13	9	79
30-----	880	79	113	222	-----	160	605	50	57	12	10	34
31-----	398	-----	109	264	-----	148	-----	44	-----	13	9	-----
1930-31												
1-----	26	75	1,900	79	75	398	770	430	368	17	17	148
2-----	31	68	920	126	62	368	605	430	222	21	15	4,230
3-----	29	55	570	81	58	308	500	353	196	22	338	2,010
4-----	26	52	398	79	62	287	430	272	171	13	430	535
5-----	30	58	383	68	68	250	383	250	148	21	236	323
6-----	42	49	605	79	62	222	323	236	126	109	11,600	236
7-----	184	40	500	62	68	264	287	209	105	113	5,690	196
8-----	272	30	465	57	68	398	250	222	118	65	1,370	148
9-----	160	20	383	82	72	398	222	264	105	34	720	126
10-----	118	33	323	79	68	880	287	570	79	34	500	113
11-----	86	32	287	90	160	1,850	500	383	94	33	465	97
12-----	137	30	264	97	148	1,320	430	323	90	26	308	90
13-----	55	33	236	79	222	880	368	272	79	19	287	79
14-----	49	30	196	109	250	680	308	264	101	21	196	86
15-----	55	20	171	90	500	500	264	196	1,200	19	160	72
16-----	52	36	148	96	570	430	264	171	338	19	148	65
17-----	31	26	148	105	1,240	353	236	160	160	15	126	55
18-----	44	23	113	86	1,240	338	209	148	118	15	118	49
19-----	43	21	101	72	800	308	272	4,510	94	13	1,200	52
20-----	40	55	109	109	640	264	236	10,200	82	12	880	49
21-----	40	101	113	97	500	272	383	1,550	68	23	760	52
22-----	40	113	109	101	570	323	430	2,430	52	21	398	43
23-----	640	37	109	101	2,830	368	398	1,850	40	79	250	40
24-----	500	52	101	90	1,550	338	338	1,200	49	55	196	55
25-----	338	62	122	82	960	236	720	960	34	43	171	398
26-----	196	34	94	68	760	236	760	680	37	29	171	160
27-----	160	62	86	90	570	840	1,080	500	34	23	126	148
28-----	118	55	68	86	500	2,970	720	430	26	19	920	171
29-----	109	800	90	72	-----	1,850	570	338	21	15	1,040	86
30-----	79	2,310	86	74	-----	1,080	430	368	18	13	264	55
31-----	82	-----	82	75	-----	880	-----	383	-----	13	196	-----

° Estimated.

*Discharge, in second-feet, of Pomme de Terre River at Hermitage, Mo., 1926-32—*  
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1.....	58	65	1,650	760	570	222	209	116	2,070	570	97	23
2.....	49	68	1,120	500	535	209	236	124	3,670	430	72	31
3.....	48	65	920	398	535	196	209	122	88 <sup>a</sup>	368	55	122
4.....	40	62	720	338	500	209	184	107	430	308	46	65
5.....	49	62	605	605	430	264	171	107	535	430	40	46
6.....	62	58	500	3,600	383	368	160	99	287	1,370	34	31
7.....	72	55	430	1,750	368	338	184	88	222	960	79	23
8.....	171	57	368	1,120	353	264	209	84	148	500	88	17
9.....	323	43	535	880	323	236	535	88	368	1,850	79	13
10.....	113	49	1,000	720	287	184	430	81	171	605	60	12
11.....	94	65	720	605	308	196	323	77	148	383	46	11
12.....	720	55	640	535	368	184	264	70	50 <sup>a</sup>	264	36	8
13.....	2,830	430	570	500	338	184	222	73	222	196	29	9
14.....	1,550	1,650	720	465	287	250	196	65	323	171	21	10
15.....	1,040	880	570	398	264	160	171	63	1,370	160	22	8
16.....	535	920	465	383	264	160	160	66	430	137	109	8
17.....	368	570	430	3,810	1,460	264	160	52	308	113	88	8
18.....	272	383	383	1,800	840	1,160	171	43	20 <sup>a</sup>	101	62	7
19.....	222	338	353	1,160	605	720	171	42	184	90	65	20
20.....	184	308	323	880	500	570	209	58	2,070	82	54	12
21.....	160	264	398	760	430	465	209	49	1,650	72	34	10
22.....	148	2,430	430	920	398	430	196	43	570	68	29	8
23.....	126	3,110	368	2,620	383	383	184	43	298	62	22	7
24.....	120	3,250	323	2,690	323	323	171	34	264	90	21	6
25.....	113	3,810	272	1,460	287	272	160	37	20 <sup>a</sup>	58	17	7
26.....	109	1,370	250	1,280	272	264	160	44	196	72	19	7
27.....	97	1,280	236	1,850	264	222	137	40	3,250	101	148	8
28.....	86	1,600	209	1,240	236	209	126	33	9,860	65	58	8
29.....	72	1,200	196	1,040	236	209	120	62	2,070	68	34	7
30.....	49	3,670	209	840	196	118	58	58	88 <sup>a</sup>	55	21	6
31.....	68		308	640	171		52			65	19	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1926-27						
October.....	13,100	367	1,780	2.72	3.14	109,000
November.....	2,620	397	864	1.32	1.47	51,400
December.....	2,060	266	789	1.20	1.38	48,500
January.....	4,730	240	1,190	1.82	2.10	73,200
February.....	1,030	308	584	.892	.93	32,400
March.....	14,600	240	2,080	3.18	3.67	128,000
April.....	19,000	536	4,130	6.31	7.04	240,000
May.....	11,300	352	1,650	2.52	2.90	101,000
June.....	17,400	412	2,980	4.55	5.08	177,000
July.....	4,970	190	782	1.19	1.37	48,100
August.....	30,800	382	3,170	4.84	5.58	195,000
September.....	1,600	178	287	.438	.49	17,100
The year.....	30,800	178	1,700	2.60	35.15	1,230,000
1927-28						
November.....	8,600	253	1,450	2.21	2.55	89,200
December.....	6,930	253	1,090	1.66	1.85	64,900
January.....			1,400	2.14	2.47	86,100
February.....		202	499	.762	.88	30,700
March.....	2,000	202	685	1.05	1.13	39,400
April.....	3,530	253	884	1.35	1.56	54,400
May.....	9,970	352	2,060	3.55	3.51	123,000
June.....	6,750	155	721	1.10	1.27	44,300
July.....	17,500	190	2,600	3.97	4.43	155,000
August.....	13,700	35	329	.502	.58	20,200
September.....	13,700	113	1,660	2.53	2.92	102,000
	1,550	20	131	.200	.22	7,800
The year.....	17,500	20	1,120	1.71	23.37	817,000

<sup>a</sup> Estimated.

*Discharge, in second-feet, of Pomme de Terre River at Hermitage, Mo., 1926-32—*  
Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1928-29						
October	56		26.0	0.040	0.05	1,600
November	76	18	45.2	.069	.07	2,660
December	3,950	24	397	.606	.77	24,400
January	4,020	236	698	1.07	1.23	42,900
February	1,650	170	354	.540	.55	19,700
March	3,880	294	860	1.31	1.51	52,900
April	12,500	430	2,050	3.13	3.49	122,000
May	14,700	500	3,990	6.09	7.02	245,000
June	3,530	141	643	.982	1.10	38,300
July	605	18	104	.159	.17	6,400
August	1,500	14	209	.319	.37	12,900
September	272	12	39.3	.060	.07	2,340
The year	14,700	12	789	1.20	16.33	571,000
1929-30						
October	880	13	119	.182	.21	7,320
November	800	75	161	.246	.27	9,580
December	196	46	102	.156	.18	6,270
January	5,290	171	827	1.26	1.45	50,800
February	6,930	250	1,170	1.79	1.86	65,000
March	1,750	148	361	.551	.64	22,200
April	605	70	131	.200	.22	7,800
May	2,000	44	466	.711	.82	28,700
June	3,600	30	450	.687	.77	26,800
July	70	12	28.7	.044	.05	1,760
August	72	5	13.8	.021	.02	848
September	2,190	5	332	.507	.57	19,800
The year	6,930	5	341	.521	7.06	247,000
1930-31						
October	640	26	123	.188	.22	7,560
November	2,310	20	147	.224	.25	8,750
December	1,700	68	293	.447	.52	18,000
January	126	57	85.8	.131	.15	5,280
February	2,830	58	524	.800	.83	29,100
March	2,970	222	648	.989	1.14	39,800
April	1,080	209	432	.660	.74	25,700
May	10,200	148	986	1.51	1.74	60,600
June	1,200	18	146	.223	.25	8,690
July	113	12	31.4	.048	.06	1,930
August	11,600	15	945	1.44	1.66	58,100
September	4,230	40	332	.507	.57	19,800
The year	11,600	12	391	.597	8.13	283,000
1931-32						
October	2,830	40	321	.490	.56	19,700
November	3,810	43	939	1.43	1.66	55,900
December	1,650	196	523	.798	.92	32,200
January	3,810	338	1,180	1.80	2.06	72,600
February	1,460	236	426	.650	.70	24,500
March	1,160	160	306	.467	.54	18,800
April	535	118	205	.313	.35	12,200
May	124	33	68.4	.104	.12	4,210
June	9,860	148	1,130	1.73	1.93	67,200
July	1,850	55	318	.485	.56	19,600
August	148	17	51.7	.079	.09	3,180
September	122	6	18.6	.028	.03	1,110
The year	9,860	6	456	.696	9.48	331,000

## 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 about 677.1 (revised) feet above mean sea level.

DRAINAGE AREA.—1,660 square miles.

RECORDS AVAILABLE.—June 1921 to September 1932.

EXTREMES.—Maximum discharge during year, 9,580 second-feet Nov. 26 (gage height, 19.80 feet); minimum discharge, 0.5 second-foot Sept. 24–26, 28, 29; minimum gage height, 0.97 foot Sept. 25, 26, 29.

1921–32: Maximum discharge, 40,000 second-feet Nov. 19, 1928 (gage height, 39.9 feet); minimum, 0.5 second-foot several days during September 1925, August and November 1930, September 1932.

REMARKS.—Records good.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	1.6	925	825	176	138	56	138	1,33C	112	90	233
2	15	1.6	600	1,990	220	129	46	129	357	71	38	55
3	10	1.7	436	1,600	176	129	40	112	43C	58	33	30
4	8	.9	357	825	197	129	38	97	24C	40	22	20
5	6	.6	340	575	104	156	30	83	41C	306	13	14
6	306	.7	306	2,540	197	186	30	77	30C	2,760	9	11
7	975	.8	275	2,820	197	156	30	69	12C	2,980	22	8
8	436	.8	233	2,650	186	112	29	62	71	3,800	26	7
9	120	.7	246	1,180	176	83	27	77	1,38C	4,190	725	5
10	60	.7	306	502	166	77	29	104	2,26C	3,090	416	4.0
11	37	.6	416	395	376	83	29	220	2,04C	1,020	147	4.0
12	77	1.6	458	395	925	83	26	197	825	416	71	3.6
13	480	1.6	458	376	416	66	25	129	30C	197	48	2.8
14	925	.8	502	480	260	70	23	97	1,02C	112	625	2.0
15	550	15	395	502	208	64	21	70	1,55C	83	1,660	1.8
16	233	16	290	395	208	77	21	57	1,12C	61	1,220	1.7
17	129	176	260	357	1,220	83	35	46	416	47	775	1.0
18	77	1,770	233	675	925	97	66	38	186	38	220	.9
19	49	2,650	220	600	575	104	60	34	112	30	376	.8
20	31	2,650	208	395	436	90	129	30	1,22C	24	138	.7
21	22	1,280	220	322	306	104	166	25	2,920	20	138	.7
22	18	1,220	208	322	275	97	166	22	3,310	17	68	.7
23	14	5,200	233	395	246	104	233	21	4,30C	14	43	.6
24	10	5,380	208	376	208	104	233	19	4,30C	14	26	.5
25	4.8	7,720	186	340	197	112	875	16	1,72C	12	21	.5
26	5	9,580	176	290	186	120	550	15	480	13	47	.5
27	4.6	8,800	156	395	166	112	322	12	29C	13	925	.6
28	3.4	6,880	138	575	156	112	233	11	975	66	925	.5
29	2.4	3,140	129	502	147	97	186	10	322	50	675	.5
30	1.8	1,440	120	395	-----	83	156	8	16C	29	246	30
31	1.6	-----	156	220	-----	70	-----	8	-----	129	112	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	975	1.6	149	0.090	0.10	9,160
November	9,580	.6	1,930	1.16	1.29	115,000
December	925	120	303	.183	.21	18,600
January	2,820	220	781	.470	.54	48,000
February	1,220	104	318	.192	.21	18,300
March	186	64	104	.063	.07	6,400
April	875	21	130	.078	.09	7,740
May	220	8	65.6	.040	.05	4,030
June	4,300	71	1,150	.693	.77	68,400
July	4,190	12	639	.385	.44	39,300
August	1,660	9	319	.192	.22	19,600
September	233	.5	14.7	.0069	.01	875
The year	9,580	.5	490	.295	4.00	355,000



## 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 about 665.9 feet above mean sea level.

DRAINAGE AREA.—About 627 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 22,000 second-feet June 28 (gage height, 17.00 feet); minimum, 19 second-feet many periods during July to September (gage height, 1.96 feet).

1930-32: Maximum discharge, that of June 28, 1932; minimum, 16 second-feet Oct. 5, 6, 1930 (gage height, 1.86 feet).

REMARKS.—Records good. Flow regulated by hydroelectric plant of Missouri Electric Power Co. half a mile upstream.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	234	151	1,500	230	741	342	356	298	312	1,160	173	204
2	176	185	1,110	264	633	286	401	318	1,300	909	267	321
3	224	197	852	270	612	291	283	323	1,850	701	207	324
4	162	176	695	330	552	319	384	263	853	640	196	301
5	255	168	643	379	548	334	387	450	552	699	287	221
6	212	175	469	519	523	258	423	468	572	718	260	169
7	210	203	540	1,320	401	349	434	453	467	1,390	93	135
8	257	147	472	1,060	506	356	395	224	477	1,140	238	162
9	260	177	433	811	459	364	394	146	427	4,720	232	159
10	221	170	474	609	421	354	326	58	384	1,610	260	166
11	255	194	659	652	427	374	538	54	402	1,050	139	120
12	612	206	618	559	395	393	463	53	316	726	209	140
13	761	285	514	468	430	212	410	55	436	647	324	155
14	649	420	575	443	329	265	412	80	435	651	93	156
15	666	736	558	461	431	296	364	73	1,830	550	262	163
16	631	850	495	479	411	317	403	161	1,170	572	292	157
17	512	735	461	1,560	408	409	310	220	726	43	345	147
18	341	555	460	2,760	425	384	375	203	591	294	232	125
19	404	494	422	1,540	455	739	398	203	402	338	184	152
20	281	490	297	1,180	470	681	390	180	473	323	183	141
21	272	422	460	983	345	680	327	190	750	302	82	129
22	279	346	337	887	428	578	344	55	547	257	191	133
23	253	527	326	1,390	387	545	385	190	487	249	184	131
24	287	1,050	344	1,900	373	478	317	178	473	128	175	133
25	221	2,150	279	1,840	354	451	419	188	534	438	168	116
26	205	1,540	321	1,340	367	487	439	285	372	601	203	141
27	244	1,080	256	1,310	353	332	437	242	513	217	357	183
28	216	1,020	285	1,300	297	418	300	250	8,630	225	135	159
29	211	936	264	1,090	407	370	72	62	9,110	206	176	201
30	183	1,270	297	978	-----	319	201	181	1,800	191	176	131
31	215	-----	287	742	-----	376	-----	252	-----	40	201	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	761	162	320	0.510	0.59	19,700
November	2,150	147	568	.906	1.01	33,800
December	1,500	256	507	.809	.93	31,200
January	2,760	230	957	1.53	1.76	58,800
February	741	297	444	.708	.76	25,500
March	739	212	399	.636	.73	24,300
April	538	72	370	.590	.66	22,000
May	468	53	205	.327	.38	12,600
June	9,110	312	1,240	1.98	2.21	73,800
July	4,720	40	701	1.12	1.29	43,100
August	357	82	210	.335	.39	12,900
September	324	116	169	.270	.30	10,100
The year	9,110	40	507	.809	11.01	368,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 711 second-feet June 28 (gage height, 1.60 feet); minimum, 79 second-feet Sept. 30.

1929-32: Maximum gage height, 4.35 feet May 6, 1932 (discharge not determined); minimum discharge, that of Sept. 30, 1932.

Maximum stage known, about 7 feet during June 1928.

REMARKS.—Records fair. Occasional run-off from small valley above spring included in records.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	98	98	180	118	168	118	127	130	146	261	118	143
2	98	98	168	121	160	118	127	124	160	232	114	118
3	98	101	152	124	156	116	121	124	143	202	111	106
4	98	101	152	124	152	116	121	124	133	188	108	101
5	96	101	146	146	156	121	121	121	130	168	106	98
6	96	98	143	242	149	124	121	121	130	164	106	98
7	96	98	140	192	146	121	121	121	130	164	106	98
8	96	96	130	168	146	118	156	124	130	176	106	96
9	96	96	149	156	143	116	146	124	130	197	106	96
10	96	96	160	146	140	116	143	121	127	176	104	92
11	96	96	149	140	140	116	140	121	121	152	104	92
12	96	96	149	136	136	121	140	118	121	143	104	96
13	106	108	149	136	133	121	133	118	136	133	104	96
14	116	124	143	127	130	121	130	121	146	127	104	96
15	111	124	136	124	127	121	127	121	130	121	111	96
16	111	124	136	149	127	121	124	121	160	116	106	94
17	111	121	133	335	140	146	127	121	130	116	96	90
18	106	124	127	305	140	172	127	121	130	114	96	90
19	101	124	127	255	140	168	124	121	127	114	96	90
20	101	124	127	222	133	164	124	121	140	111	94	90
21	101	121	127	192	140	164	124	121	127	111	94	90
22	98	118	124	202	130	149	127	118	130	111	94	90
23	98	116	118	267	130	143	127	118	127	111	92	86
24	101	152	114	242	127	133	130	121	127	111	92	86
25	101	180	111	274	127	130	130	121	130	111	90	83
26	101	152	111	255	121	130	127	121	124	111	106	83
27	101	152	114	242	121	130	124	118	511	111	106	83
28	101	152	114	242	121	130	124	116	653	111	104	83
29	101	152	114	222	121	130	124	118	456	108	101	83
30	101	202	116	207	-----	130	133	118	320	121	101	79
31	98	-----	118	184	-----	133	-----	118	-----	121	98	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	116	96	101	6,210
November	202	96	122	7,260
December	180	111	135	8,300
January	335	118	193	11,900
February	168	121	138	7,940
March	172	116	131	8,060
April	156	121	129	7,680
May	130	116	121	7,440
June	653	121	182	10,800
July	261	108	142	8,730
August	118	90	103	6,330
September	143	79	94.1	5,600
The year	653	79	132	96,200

## 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 1 $\frac{1}{2}$  miles west of Hazlegreen.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 12,700 second-feet June 28 (gage height, 13.12 feet); minimum, 46 second-feet Sept. 23, 24, 26 (gage height, 1.31 feet).

1929-32: Maximum discharge, 19,000 second-feet May 7, 1929 (gage height, 16.21 feet); minimum discharge, 45 second-feet Aug. 9, 1930; minimum gage height, 1.31 feet Sept. 23, 24, 26, 1932.

Maximum stage known, 31.8 feet in January 1916.

REMARKS.—Records good. Discharge estimated Oct. 6.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	138	94	620	530	985	380	440	380	314	1,450	265	120
2.....	130	94	710	680	920	380	440	380	1,800	1,180	234	107
3.....	123	94	650	770	800	380	410	352	1,050	985	213	94
4.....	117	94	560	680	740	352	410	325	770	860	204	84
5.....	114	94	500	860	680	380	380	325	620	920	184	80
6.....	112	92	440	1,310	620	410	380	303	500	2,570	166	74
7.....	110	92	410	2,330	590	440	380	281	410	2,410	162	74
8.....	110	92	380	1,730	560	440	410	260	352	1,870	150	70
9.....	104	90	380	1,520	530	410	560	249	352	1,800	134	66
10.....	104	94	410	1,050	500	380	860	239	298	1,450	123	66
11.....	110	94	470	860	500	352	800	228	281	1,050	130	62
12.....	110	107	500	740	470	352	710	208	254	800	127	62
13.....	114	162	710	680	560	325	620	199	270	680	142	66
14.....	120	228	680	620	560	325	560	194	265	590	130	62
15.....	127	314	650	620	500	320	500	189	680	500	260	60
16.....	154	249	590	1,380	500	314	470	170	590	470	175	58
17.....	154	270	530	4,000	530	560	440	162	590	410	158	58
18.....	146	244	500	6,840	620	1,380	410	154	500	352	162	54
19.....	138	228	440	3,300	710	1,590	410	154	410	325	150	48
20.....	130	228	410	1,940	680	1,380	380	146	410	308	276	48
21.....	123	218	380	1,050	650	1,050	380	138	440	276	228	47
22.....	120	218	380	2,490	590	1,050	352	130	352	265	189	47
23.....	117	218	352	7,260	560	860	352	123	314	470	158	47
24.....	117	303	325	5,100	500	770	325	117	325	270	150	47
25.....	110	325	325	3,400	470	680	314	117	292	244	142	47
26.....	107	303	314	2,570	440	620	303	123	260	249	150	47
27.....	104	308	303	2,170	410	590	281	123	2,410	223	380	51
28.....	97	303	292	1,870	410	530	270	123	11,200	223	254	50
29.....	94	440	265	1,660	380	500	270	117	4,200	244	162	50
30.....	92	440	298	1,450	-----	470	352	120	2,010	308	134	51
31.....	92	-----	380	1,240	-----	440	-----	120	-----	292	208	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	154	92	117	0.094	0.11	7,190
November.....	440	90	204	.163	.18	12,100
December.....	710	265	457	.366	.42	28,100
January.....	7,260	530	2,020	1.62	1.87	124,000
February.....	985	380	585	.468	.50	33,600
March.....	1,590	314	594	.475	.55	36,500
April.....	860	270	439	.351	.39	26,100
May.....	380	117	202	.162	.19	12,400
June.....	11,200	254	1,080	.864	.96	64,300
July.....	2,570	223	776	.621	.72	47,700
August.....	380	123	184	.147	.17	11,300
September.....	120	47	63.2	.051	.06	3,760
The year.....	11,200	47	562	.450	6.12	407,000

## 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 (revised) feet above mean sea level.

DRAINAGE AREA.—1,680 square miles.

RECORDS AVAILABLE.—June 1921 to September 1932.

EXTREMES.—Maximum discharge during year, 20,600 second-feet June 29 (gage height, 15.01 feet); minimum, 75 second-feet Sept. 23–25 (gage height, 1.96 feet).

1921–32: Maximum discharge, 27,300 second-feet June 10, 1928 (gage height, 18.20 feet); minimum discharge, that of Sept. 23–25, 1932.

Maximum stage known, 24.3 feet Aug. 22, 1915.

REMARKS.—Records good.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	200	123	600	540	1,560	482	570	382	190	2,030	287	510
2.....	193	131	630	600	1,300	482	570	455	283	1,560	303	315
3.....	186	131	795	830	1,220	482	540	455	1,560	1,390	275	207
4.....	182	131	760	980	1,060	455	540	455	1,060	1,220	248	172
5.....	172	129	662	1,020	942	482	510	405	905	980	230	153
6.....	165	126	570	1,560	905	570	510	405	695	1,140	218	131
7.....	182	120	540	1,840	830	540	510	455	630	3,860	267	129
8.....	200	131	482	2,390	760	540	482	360	510	2,260	207	123
9.....	215	120	455	1,930	718	510	482	315	455	1,840	218	118
10.....	179	126	455	1,560	695	482	830	311	430	1,840	156	112
11.....	190	140	510	1,300	630	482	942	307	360	1,480	140	107
12.....	172	146	570	1,140	600	455	905	271	315	1,140	168	105
13.....	182	186	630	980	570	455	868	256	303	942	190	102
14.....	168	241	830	868	662	405	795	252	315	760	165	93
15.....	172	275	795	795	695	405	695	252	303	630	153	95
16.....	176	360	795	905	662	405	630	248	455	570	230	93
17.....	159	311	718	2,650	662	405	570	237	570	455	260	90
18.....	196	299	662	7,000	662	630	540	226	600	455	190	93
19.....	190	299	600	7,180	760	1,840	510	218	600	405	172	88
20.....	190	279	570	3,580	905	1,840	510	207	455	405	156	85
21.....	182	260	510	2,520	868	1,560	455	207	455	382	146	83
22.....	168	271	482	2,140	795	1,300	455	200	430	338	190	79
23.....	168	264	455	4,140	760	1,220	430	193	405	295	193	77
24.....	172	295	430	9,100	695	1,140	430	186	360	283	165	75
25.....	156	405	405	7,720	630	1,020	405	186	338	295	172	75
26.....	150	382	405	4,140	600	905	382	186	360	295	190	83
27.....	140	540	382	3,040	570	905	360	190	830	271	248	85
28.....	123	540	360	2,780	540	830	360	186	4,140	252	252	81
29.....	120	540	360	2,390	510	760	360	179	18,100	233	271	79
30.....	143	600	360	2,030	-----	662	338	172	3,580	233	222	88
31.....	137	-----	405	1,740	-----	630	-----	176	-----	211	271	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	215	120	172	0.102	0.12	10,600
November.....	600	120	263	.157	.18	15,600
December.....	830	360	564	.33C	.38	34,100
January.....	9,100	540	2,630	1.57	1.81	162,000
February.....	1,560	510	785	.467	.50	45,200
March.....	1,840	405	751	.447	.52	46,200
April.....	942	338	549	.327	.36	32,700
May.....	455	172	275	.164	.19	16,900
June.....	18,100	190	1,330	.792	.88	79,100
July.....	3,860	211	918	.54C	.63	56,400
August.....	303	140	211	.12C	.15	13,000
September.....	510	75	124	.074	.08	7,380
The year.....	18,100	75	715	.42C	5.8	519,000

## 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 1932. April 1903 to July 1906 at Arlington, Mo.

EXTREMES.—Maximum discharge during year, 11,100 second-feet Jan. 24 (gage height, 8.50 feet); minimum, 338 second-feet Sept. 24, 25 (gage height, 1.38 feet).

1903-6, 1923-32: Maximum discharge, 51,800 second-feet June 10, 1928 (gage height, 23.25 feet); minimum, that of Sept. 24, 25, 1932.

Maximum stage known, about 29.0 feet Jan. 6, 1897 (revised).

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	509	458	1,300	1,580	2,660	1,080	1,250	830	569	3,430	785	1,080
2	492	458	1,360	1,580	2,420	1,080	1,250	880	569	2,420	698	980
3	492	458	1,470	1,580	2,180	1,030	1,200	930	1,300	2,060	655	698
4	475	458	1,470	1,820	2,060	1,030	1,140	930	1,820	1,940	575	615
5	475	450	1,300	2,300	1,820	1,140	1,140	880	1,470	1,700	567	543
6	458	450	1,200	2,660	1,700	1,200	1,080	830	1,360	1,580	551	495
7	458	441	1,080	3,430	1,580	1,200	1,080	880	1,140	2,420	698	472
8	1,140	441	1,030	3,840	1,580	1,200	1,080	785	1,030	3,560	615	442
9	695	441	1,140	3,430	1,470	1,140	1,080	785	930	2,660	551	428
10	578	441	1,140	2,780	1,360	1,140	1,200	740	880	2,420	535	420
11	560	475	1,200	2,420	1,360	1,080	1,580	740	785	2,420	527	406
12	569	475	1,470	2,060	1,300	1,030	1,700	695	695	1,820	543	392
13	587	614	1,820	1,820	1,470	980	1,580	695	695	1,470	930	399
14	614	740	1,700	1,700	1,470	930	1,470	650	695	1,300	740	385
15	605	740	1,820	1,580	1,470	930	1,360	641	650	1,140	615	378
16	569	695	1,700	1,940	1,470	880	1,250	641	650	1,030	698	378
17	569	785	1,580	3,430	1,580	980	1,200	623	980	930	698	371
18	560	740	1,360	8,500	1,580	1,700	1,140	596	930	830	698	364
19	552	695	1,300	10,000	1,700	2,660	1,080	587	980	740	740	357
20	543	785	1,200	6,360	1,700	3,170	1,080	599	880	698	615	350
21	526	740	1,200	4,540	1,820	2,780	1,030	560	830	655	559	350
22	526	740	1,080	3,980	1,700	2,540	1,030	552	830	655	559	350
23	518	785	1,030	7,300	1,580	2,300	980	543	785	655	567	350
24	509	930	980	10,900	1,470	2,180	930	526	740	655	535	338
25	492	930	930	8,900	1,360	1,940	930	518	695	740	503	338
26	509	930	880	6,720	1,300	1,820	880	552	695	655	785	364
27	492	1,030	880	5,250	1,250	1,700	880	534	1,470	615	655	364
28	475	1,080	830	4,680	1,200	1,470	830	526	1,580	575	698	350
29	466	1,140	830	4,120	1,140	1,470	830	526	8,900	567	698	350
30	466	1,300	1,030	3,560	-----	1,360	880	509	6,360	567	615	350
31	458	-----	1,700	3,040	-----	1,300	-----	509	-----	615	575	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,140	458	546	0.192	0.22	33,600
November	1,300	441	695	.245	.27	41,400
December	1,820	830	1,260	.444	.51	77,500
January	10,900	1,580	4,120	1.45	1.67	253,000
February	2,660	1,140	1,610	.567	.61	92,600
March	3,170	880	1,500	.528	.61	92,200
April	1,700	830	1,140	.401	.45	67,800
May	930	509	668	.235	.27	41,100
June	8,900	569	1,400	.493	.55	83,800
July	3,560	567	1,400	.493	.57	86,100
August	930	503	638	.225	.26	39,200
September	1,080	338	449	.158	.18	26,700
The year	10,900	338	1,290	.454	6.17	934,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 11,900 second-feet Jan. 25 (gage height, 9.55 feet); minimum discharge, 412 second-feet Sept. 20–26, 29, 30; minimum gage height, 0.99 foot Sept. 25.

1921–32: Maximum discharge, 51,000 second-feet June 11, 1928 (gage height, 22.83 feet); minimum, 410 second-feet Sept. 29, 30, 1922.

REMARKS.—Records good. Discharge estimated May 17, 18, June 1.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	625	530	1,850	4,250	3,400	1,300	1,480	932	679	5,950	658	790
2	625	560	1,660	2,460	2,920	1,210	1,390	932	658	3,400	658	1,090
3	592	530	1,660	2,150	2,680	1,210	1,300	932	658	2,680	755	1,130
4	530	530	1,660	2,150	2,570	1,210	1,300	895	1,300	2,350	690	895
5	625	530	1,660	3,400	2,350	1,210	1,300	895	1,570	2,460	592	755
6	592	530	1,480	4,000	2,150	1,300	1,210	895	1,470	1,660	592	658
7	560	500	1,300	3,400	1,950	1,300	1,210	895	1,300	1,750	658	592
8	825	500	1,210	4,120	1,850	1,300	1,130	860	1,270	2,800	690	560
9	1,390	530	1,850	4,120	1,750	1,300	1,130	860	1,070	3,400	625	530
10	1,050	500	1,750	3,640	1,570	1,300	1,130	825	970	2,800	560	530
11	790	825	1,570	3,040	1,570	1,210	1,300	790	970	2,570	560	470
12	722	560	1,480	2,570	1,660	1,210	1,660	755	830	1,850	722	470
13	755	1,480	1,850	2,350	1,570	1,130	1,660	755	825	1,390	1,570	530
14	825	1,210	2,050	2,050	1,480	1,050	1,570	722	755	1,390	932	470
15	790	1,050	2,150	1,950	1,660	1,050	1,480	690	722	1,390	2,350	470
16	722	932	2,150	3,160	1,660	1,050	1,390	690	722	1,300	825	470
17	722	860	1,850	4,640	1,750	1,090	1,390	668	755	860	690	440
18	690	895	1,750	5,800	1,750	1,130	1,300	647	830	860	722	440
19	658	1,300	1,660	7,830	1,750	1,480	1,210	625	1,070	860	755	440
20	658	1,210	1,570	10,100	1,850	2,920	1,210	625	1,130	825	790	412
21	658	1,090	2,800	7,190	1,950	3,400	1,210	592	1,070	755	690	412
22	625	1,010	1,660	5,060	1,850	3,400	1,130	592	835	722	658	412
23	625	860	1,480	6,870	1,850	2,920	1,090	592	830	690	592	412
24	625	1,750	1,300	9,900	1,750	2,570	1,050	592	825	625	625	412
25	592	1,390	1,210	11,300	1,660	2,350	970	560	730	658	625	412
26	592	1,300	1,210	9,540	1,570	2,150	970	592	755	722	755	412
27	592	1,390	1,090	7,510	1,480	1,950	932	592	1,300	755	932	440
28	560	1,660	1,050	6,400	1,300	1,850	932	560	1,750	690	895	440
29	560	1,850	1,050	5,800	1,300	1,660	895	560	2,250	625	895	412
30	560	1,950	1,050	5,500	-----	1,570	970	560	9,720	592	790	412
31	560	-----	7,990	4,380	-----	1,390	-----	560	-----	592	755	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,390	530	687	0.216	0.25	42,200
November	1,950	500	994	.317	.35	59,100
December	7,990	1,050	1,810	.566	.66	111,000
January	11,300	1,950	5,050	1.59	1.83	311,000
February	3,400	1,300	1,880	.591	.64	108,000
March	3,400	1,050	1,650	.515	.60	101,000
April	1,660	895	1,280	.387	.43	73,200
May	932	560	717	.225	.26	44,100
June	9,720	609	1,320	.415	.46	78,600
July	5,950	592	1,610	.506	.58	99,000
August	2,350	560	794	.255	.29	48,800
September	1,130	412	544	.171	.19	32,400
The year	11,300	412	1,530	.481	6.54	1,110,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 4,770 second-feet Jan. 17 (gage height, 7.70 feet); minimum, 97 second-feet Sept. 24, 25 (gage height, 1.70 feet).

1921-32: Maximum discharge, 15,200 second-feet June 9, 1928 (gage height, 16.30 feet); minimum, 76 second-feet July 30, 31, 1926 (gage height, 1.60 feet).

REMARKS.—Records good.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	124	120	460	364	486	251	286	186	164	169	186	126
2.....	120	120	344	486	460	251	268	169	205	169	148	122
3.....	124	111	305	364	570	268	251	175	199	169	148	166
4.....	120	120	268	364	410	268	251	164	251	175	129	136
5.....	115	115	268	387	364	286	251	158	268	175	124	124
6.....	111	115	251	1,240	344	324	234	153	180	180	124	120
7.....	111	124	234	950	344	344	251	164	175	175	124	115
8.....	133	120	218	750	324	324	251	158	164	175	120	111
9.....	129	115	234	570	324	286	387	153	158	175	115	107
10.....	138	120	286	460	305	286	344	153	148	186	138	104
11.....	129	129	364	387	286	268	344	148	138	180	115	107
12.....	143	129	1,090	364	486	251	324	143	138	153	120	104
13.....	148	158	690	344	512	251	305	138	133	143	120	104
14.....	169	251	690	324	460	234	286	143	129	133	169	104
15.....	164	164	570	286	410	234	251	133	138	124	192	104
16.....	169	458	460	410	410	234	234	138	133	124	129	104
17.....	158	158	512	4,770	570	880	251	133	124	124	186	111
18.....	143	158	324	1,880	630	1,320	251	124	129	120	305	104
19.....	138	169	286	1,240	541	950	251	133	124	120	199	100
20.....	138	192	950	512	512	810	234	129	111	120	164	100
21.....	133	234	286	810	435	690	218	124	104	111	133	100
22.....	129	268	251	1,160	364	660	218	133	107	111	133	100
23.....	129	234	251	3,300	344	541	212	124	115	111	129	100
24.....	124	218	234	2,240	344	460	212	124	107	115	122	97
25.....	120	205	218	1,560	324	435	192	124	107	124	122	97
26.....	124	186	186	1,090	286	387	199	133	120	115	126	104
27.....	129	212	205	1,090	286	364	192	129	234	115	136	104
28.....	124	212	199	950	286	324	186	148	268	120	140	107
29.....	120	218	186	810	268	305	199	129	234	133	131	107
30.....	124	286	218	720	-----	305	192	124	192	138	118	107
31.....	124	-----	251	690	-----	286	-----	120	-----	234	118	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	169	111	132	0.236	0.27	8,120
November.....	286	111	171	.305	.34	10,200
December.....	1,090	186	343	.612	.71	21,100
January.....	4,770	286	1,010	1.80	2.08	62,100
February.....	630	268	403	.720	.75	23,200
March.....	1,320	234	422	.754	.87	25,900
April.....	387	186	251	.448	.50	14,900
May.....	186	120	142	.254	.29	8,730
June.....	268	104	160	.286	.32	9,520
July.....	234	111	146	.261	.30	8,980
August.....	305	115	144	.257	.30	8,850
September.....	166	97	110	.196	.22	6,550
The year.....	4,770	97	287	.512	6.98	208,000

## 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 1932.

EXTREMES.—Maximum discharge during year, 1,390 second-feet Dec. 31 (gage height, 3.38 feet); minimum discharge, 28 second-feet Sept. 11, 14-19, 22; minimum gage height, 0.89 foot June 8.

1929-32: Maximum discharge, 8,860 second-feet May 6, 1929 (gage height, 7.22 feet); minimum discharge and gage height, those of September and June 1932.

Maximum stage known, 13.7 feet Aug. 20, 1915.

REMARKS.—Records good except those for Aug. 16 to Sept. 30, which are fair.

*Discharge, in second-feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	37	42	98	295	110	65	83	55	50	92	50	46
2.	37	42	76	188	106	70	76	52	42	80	50	45
3.	37	42	76	110	102	67	73	51	39	73	48	40
4.	37	42	76	102	102	69	73	50	43	90	47	36
5.	37	42	70	360	94	76	70	50	33	87	47	34
6.	36	42	67	266	87	67	67	49	35	88	47	32
7.	37	42	62	165	80	67	73	48	35	80	132	31
8.	266	43	62	137	76	67	70	47	34	73	63	31
9.	65	46	180	110	73	70	65	47	41	67	54	31
10.	52	48	115	98	70	59	65	46	41	60	52	31
11.	46	55	126	90	256	59	62	45	41	60	48	28
12.	50	55	102	83	90	57	62	45	40	58	50	29
13.	57	102	106	76	76	57	59	44	39	56	238	29
14.	62	76	94	73	73	55	59	43	42	54	92	28
15.	52	73	80	70	73	57	57	43	41	54	87	28
16.	46	62	76	132	70	57	57	43	43	56	83	28
17.	45	59	76	420	137	87	62	40	52	54	59	28
18.	43	62	73	247	115	94	57	40	50	52	46	28
19.	42	57	67	180	106	94	57	40	60	51	42	28
20.	42	70	87	151	90	94	57	39	63	50	37	31
21.	42	70	73	137	94	94	55	39	60	50	33	30
22.	40	65	83	360	87	132	55	40	63	50	31	28
23.	40	62	76	360	80	110	55	39	63	50	31	29
24.	40	115	70	256	76	102	54	38	63	52	31	31
25.	40	83	65	212	73	94	54	38	80	50	31	29
26.	45	76	65	256	73	90	54	42	60	50	56	33
27.	43	106	62	247	70	85	52	43	154	51	39	32
28.	43	90	62	204	67	80	52	40	192	50	44	30
29.	43	98	62	196	67	76	55	40	120	50	51	31
30.	43	126	305	144	70	62	40	104	49	46	29	29
31.	43	-----	1,390	121	-----	87	-----	39	-----	52	42	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	266	36	51.2	0.256	0.30	3,150
November	126	42	66.4	.332	.37	3,950
December	1,390	62	131	.655	.76	8,060
January	420	70	189	.945	1.09	11,600
February	256	67	92.2	.461	.50	5,300
March	132	55	77.7	.388	.45	4,780
April	83	52	61.7	.308	.34	3,670
May	55	38	43.7	.218	.25	2,690
June	192	34	62.5	.312	.35	3,720
July	92	49	60.9	.304	.35	3,740
August	238	31	58.3	.292	.34	3,580
September	46	28	31.5	.158	.18	1,870
The year	1,390	28	77.3	.386	5.28	56,100



## 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, 1932*

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				<i>Feet</i>	<i>Sec.-ft.</i>
Nov. 28	Missouri River	Mississippi River	St. Charles, Mo.	25.04	229,000
Dec. 5	do	do	do	18.26	95,500
Oct. 11	do	do	do	13.64	50,700
Oct. 19	Little Papillion Creek	Missouri River	Sec. 1, T. 14 N., R. 12 E., near Omaha, Nebr.		3.4
Nov. 31	do	do	do		3.4
Nov. 13	do	do	do		4.5
Jan. 15	do	do	do		10.6
Feb. 20	do	do	do		19.9
Mar. 19	do	do	do		19.8
Apr. 11	do	do	do		10.0
May 22	do	do	do		7.3
June 12	do	do	do		16.9
July 8	do	do	do		8.1
Aug. 12	do	do	do		6,020
Sept. 12	do	do	do		*7,100
Sept. 19	do	do	do		7.7
Oct. 8	Middle Loup River	Loup River	Sec. 1, T. 19 N., R. 20 W., near Sargent, Nebr.		870
Nov. 25	do	do	do		883
Nov. 5	do	do	do		848
Nov. 18	do	do	do		928
Jan. 8	do	do	do		867
Feb. 10	do	do	do		1,140
Mar. 16	do	do	do		4,230
Apr. 5	do	do	do		836
May 25	do	do	do		917
Jan. 10	do	do	do		801
July 13	do	do	do		687
Aug. 16	do	do	do		717
Sept. 15	do	do	do		818
Oct. 7	Mud Creek	do	Sec. 22, T. 13 N., R. 15 W., near Hazard, Nebr.		13.0
Nov. 24	do	do	do		17.5
Nov. 5	do	do	do		16.3
Nov. 17	do	do	do		22.2
Jan. 7	do	do	do		28.7
Feb. 11	do	do	do		175
Mar. 16	do	do	do		37.6
Apr. 16	do	do	do		28.8
May 25	do	do	do		14.4
June 11	do	do	do		100
July 12	do	do	do		26.1
Aug. 16	do	do	do		42.1
Sept. 15	do	do	do		29.7
Oct. 18	North Loup River	do	Sec. 23, T. 21 N., R. 18 W., at Taylor, Nebr.		512
Nov. 26	do	do	do		500
Nov. 6	do	do	do		510
Nov. 18	do	do	do		549
Jan. 8	do	do	do		482
Feb. 10	do	do	do		749
Mar. 15	do	do	do		661
Apr. 4	do	do	do		494
May 24	do	do	do		397
June 10	do	do	do		429
July 13	do	do	do		341
Aug. 15	do	do	do		367
Sept. 14	do	do	do		421

\* Estimate of crest flow.

*Miscellaneous discharge measurements in Missouri River drainage basin during the year ending Sept. 30, 1932—Continued*

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	Sec.-ft.
Oct. 13	Timber Creek	Cedar River	Sec. 17, T. 17 N., R. 7 W. near Belgrade, Nebr.		3.0
28	do	do	do		1.3
Nov. 9	do	do	do		2.6
20	do	do	do		8.0
Jan. 14	do	do	do		1.6
Feb. 6	do	do	do		1.6
Mar. 10	do	do	do		2.9
30	do	do	do		5.7
Apr. 19	do	do	do		6.6
May 20	do	do	do		3.3
June 6	do	do	do		5.6
July 9	do	do	do		3.9
Aug. 10	do	do	do		14.8
Oct. 13	Beaver Creek	Loup River	Sec. 15, T. 20 N., R. 6 W., at Albion, Nebr.		66
28	do	do	do		46
Nov. 9	do	do	do		52
20	do	do	do		67
Jan. 11	do	do	do		67
Feb. 6	do	do	do		52
Mar. 12	do	do	do		59
Apr. 4	do	do	do		74
May 23	do	do	do		39.8
June 8	do	do	do		191
July 9	do	do	do		42.1
Aug. 10	do	do	do		44.4
Sept. 17	do	do	do		40.1
Oct. 20	Wahoo Creek	Salt Creek	Sec. 36, T. 13 N., R. 9 E., near Ashland, Nebr.		21.8
Nov. 2	do	do	do		16.9
12	do	do	do		25.0
Jan. 16	do	do	do		65
Feb. 22	do	do	do		69
Mar. 22	do	do	do		65
Apr. 9	do	do	do		49.2
May 28	do	do	do		50.6
June 13	do	do	do		513
July 7	do	do	do		38.0
Oct. 20	Upper Clear Creek	Wahoo Creek	do		4.6
Nov. 2	do	do	do		3.4
12	do	do	do		11.1
Jan. 16	do	do	do		15.9
Feb. 22	do	do	do		53
Mar. 22	do	do	do		16.3
Apr. 9	do	do	do		9.9
May 28	do	do	do		7.3
June 13	do	do	do		172
July 7	do	do	do		7.4
Aug. 12	do	do	do		174
Sept. 20	do	do	do		5.3
Oct. 21	Oak Creek	Salt Creek	Sec. 15, T. 10 N., R. 6 E., near Lincoln, Nebr.		4.8
Nov. 2	do	do	do		3.1
12	do	do	do		5.4
Jan. 21	do	do	do		10.1
Feb. 23	do	do	do		45.1
Mar. 22	do	do	do		27.9
Apr. 11	do	do	do		21.5
May 27	do	do	do		26.3
June 14	do	do	do		53
July 18	do	do	do		7.1
Aug. 19	do	do	do		11.8
Sept. 20	do	do	do		4.4
Jan. 28	Republican River	Kansas River	Sec. 22, T. 4 N., R. 24 W., at Holbrook, Nebr.		280
Feb. 27	do	do	do		599
Mar. 26	do	do	do		468
Apr. 15	do	do	do		308
June 2	do	do	do		1,300
18	do	do	do		1,300
July 21	do	do	do		2.8
Aug. 23	do	do	do		27.8
Sept. 25	do	do	do		24.8

*Miscellaneous discharge measurements in Missouri River drainage basin during the year ending Sept. 30, 1932—Continued*

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				<i>Feet</i>	<i>Sec.-ft.</i>
Jan. 27	Republican River	Kansas River	Sec. 7, T. 3 N., R. 20 W., at Oxford, Nebr.		262
Feb. 27	do.	do.	do.		786
Mar. 25	do.	do.	do.		475
Apr. 14	do.	do.	do.		361
June 1	do.	do.	do.		1,140
June 17	do.	do.	do.		1,030
July 21	do.	do.	do.		33.4
Aug. 23	do.	do.	do.		55
Sept. 24	do.	do.	do.		3.6
Jan. 28	Medicine Creek	Republican River	Sec. 18, T. 4 N., R. 25 W., at Cambridge, Nebr.		42.1
Feb. 27	do.	do.	do.		67
Mar. 26	do.	do.	do.		56.8
Apr. 15	do.	do.	do.		53.5
June 2	do.	do.	do.		1,040
June 17	do.	do.	do.		534
July 21	do.	do.	do.		26.4
Aug. 23	do.	do.	do.		19.9
Sept. 25	do.	do.	do.		35.2
Jan. 28	Deer Creek	do.	Sec. 23, T. 4 N., R. 24 W., at Holbrook, Nebr.		2
Feb. 27	do.	do.	do.		3.2
Mar. 26	do.	do.	do.		4
Apr. 15	do.	do.	do.		2
June 2	do.	do.	do.		781
June 18	do.	do.	do.		37.4
July 21	do.	do.	do.		.01
Aug. 23	do.	do.	do.		0
Sept. 25	do.	do.	do.		.08
Jan. 27	Muddy Creek	do.	Sec. 16, T. 4 N., R. 23 W., at Arapahoe, Nebr.		2.3
Feb. 27	do.	do.	do.		13.9
Mar. 26	do.	do.	do.		4.9
Apr. 15	do.	do.	do.		5.2
June 2	do.	do.	do.		1,880
June 18	do.	do.	do.		75
July 21	do.	do.	do.		41.5
Aug. 23	do.	do.	do.		1
Sept. 25	do.	do.	do.		1.0
Jan. 26	Turkey Creek	do.	Sec. 31, T. 4 N., R. 21 W., at Oxford, Nebr.		3.9
Feb. 27	do.	do.	do.		6.5
Mar. 25	do.	do.	do.		3.0
Apr. 14	do.	do.	do.		3.1
June 1	do.	do.	do.		2.5
June 17	do.	do.	do.		717
July 21	do.	do.	do.		2.8
Aug. 23	do.	do.	do.		.8
Sept. 24	do.	do.	do.		.6
Jan. 27	Beaver Creek	do.	Sec. 17, T. 1 N., R. 26 W., at Lebanon, Nebr.		.9
Feb. 26	do.	do.	do.		14.2
Mar. 25	do.	do.	do.		4.0
Apr. 15	do.	do.	do.		4.1
June 1	do.	do.	do.		41.1
June 17	do.	do.	do.		31.9
July 21	do.	do.	do.		1.4
Aug. 22	do.	do.	do.		2.9
Sept. 25	do.	do.	do.		0
Jan. 27	do.	do.	Sec. 19, T. 2 N., R. 23 W., near Beaver City, Nebr.		3.2
Feb. 26	do.	do.	do.		39.8
Mar. 25	do.	do.	do.		8.4
Apr. 15	do.	do.	do.		6.4
June 1	do.	do.	do.		223
June 17	do.	do.	do.		60
July 21	do.	do.	do.		1
Aug. 22	do.	do.	do.		2
Sept. 25	do.	do.	do.		.04
Jan. 26	do.	do.	Sec. 10, T. 2 N., R. 21 W., near Hollinger, Nebr.		1.0
Feb. 26	do.	do.	do.		16.3
Mar. 25	do.	do.	do.		12.9
Apr. 15	do.	do.	do.		10.0
June 1	do.	do.	do.		227
June 17	do.	do.	do.		364
July 21	do.	do.	do.		.3
Aug. 22	do.	do.	do.		0
Sept. 24	do.	do.	do.		0

*Miscellaneous discharge measurements in Missouri River drainage basin during the year ending Sept. 30, 1932—Continued*

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	Sec.-ft.
Jan. 26	Flag Creek	Republican River	Sec. 16, T. 2 N., R. 19 W., at Orleans, Nebr.		1.4
Feb. 26	do	do	do		4.5
Mar. 25	do	do	do		1.6
Apr. 14	do	do	do		1.7
June 1	do	do	do		1.2
16	do	do	do		.6
July 20	do	do	do		.3
Aug. 22	do	do	do		* 1.0
Sept. 24	do	do	do		.6
Jan. 26	Big Cottonwood Creek	do	Sec. 6, T. 1 N., R. 15 W., at Bloomington, Nebr.		4.6
Feb. 26	do	do	do		6.2
Mar. 25	do	do	do		4.0
Apr. 14	do	do	do		4.1
May 31	do	do	do		3.2
June 16	do	do	do		3.4
July 20	do	do	do		2.2
Aug. 22	do	do	do		3.5
Sept. 24	do	do	do		3.1
Jan. 25	Farmers Creek	do	Sec. 5, T. 1 N., R. 12 W., near Riverton, Nebr.		1.7
Feb. 25	do	do	do		15.6
Mar. 24	do	do	do		5.4
Apr. 14	do	do	do		2.0
May 31	do	do	do		1.0
June 16	do	do	do		1.4
July 20	do	do	do		0
Aug. 22	do	do	do		* 2
Sept. 23	do	do	do		.2
Jan. 25	Indian Creek	do	Sec. 4, T. 1 N., R. 11 W., near Red Cloud, Nebr.		.3
Feb. 25	do	do	do		20.4
Mar. 25	do	do	do		6.4
Apr. 14	do	do	do		1.2
May 31	do	do	do		.4
June 16	do	do	do		.2
July 20	do	do	do		0
Aug. 22	do	do	do		0
Sept. 23	do	do	do		0
Oct. 21	Big Blue River	Kansas River	Sec. 16, T. 11 N., R. 3 E., at Seward, Nebr.		2.4
Nov. 2	do	do	do		38.2
12	do	do	do		36.0
Jan. 21	do	do	do		45.0
Feb. 23	do	do	do		63
Mar. 23	do	do	do		86
Apr. 11	do	do	do		52
May 27	do	do	do		35.4
June 14	do	do	do		435
July 18	do	do	do		95
Jan. 23	Little Blue River	Big Blue River	Sec. 20, T. 3 N., R. 4 W., near Deshler, Nebr.		74
Feb. 25	do	do	do		218
Mar. 24	do	do	do		106
Apr. 13	do	do	do		80
May 31	do	do	do		82
June 16	do	do	do		140
July 20	do	do	do		48.9
Aug. 22	do	do	do		54
Sept. 22	do	do	do		78.5
Oct. 15	do	do	Sec. 7, T. 2 N., R. 2 W., at Hebron, Nebr.		124
29	do	do	do		98
Nov. 10	do	do	do		95
21	do	do	do		103
Jan. 23	do	do	do		96
Feb. 25	do	do	do		347
Mar. 24	do	do	do		160
Apr. 13	do	do	do		146
May 31	do	do	do		132
June 15	do	do	do		212
July 20	do	do	do		142
Aug. 19	Locust Creek	Grand River	Reger, Mo.		3,350
20	Conn Spring	Niangua River	Brice, Mo.		5.1
Nov. 8	Roubidoux Spring	Roubidoux Creek	Waynesville, Mo.		11
June 27	Shanghai Spring	Piney Creek	Sec. 24, T. 36 N., R. 11 W., 7 miles east of Waynesville, Mo.		9.6
26	Gaines Ford Spring	Gasconade River	Sec. 35, T. 39 N., R. 9 W., 10 miles northwest of Rolla, Mo.		4.2

\* Estimated.

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