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# SURFACE WATER SUPPLY *of the* UNITED STATES 1932

PART 12

NORTH PACIFIC SLOPE BASINS

A. PACIFIC SLOPE BASINS IN WASHINGTON AND  
UPPER COLUMBIA RIVER BASIN

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## ILLUSTRATION

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

# SURFACE WATER SUPPLY OF PACIFIC SLOPE BASINS IN WASHINGTON AND UPPER COLUM- BIA 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	1921-23----	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 preceding three months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as underground water, and this stored

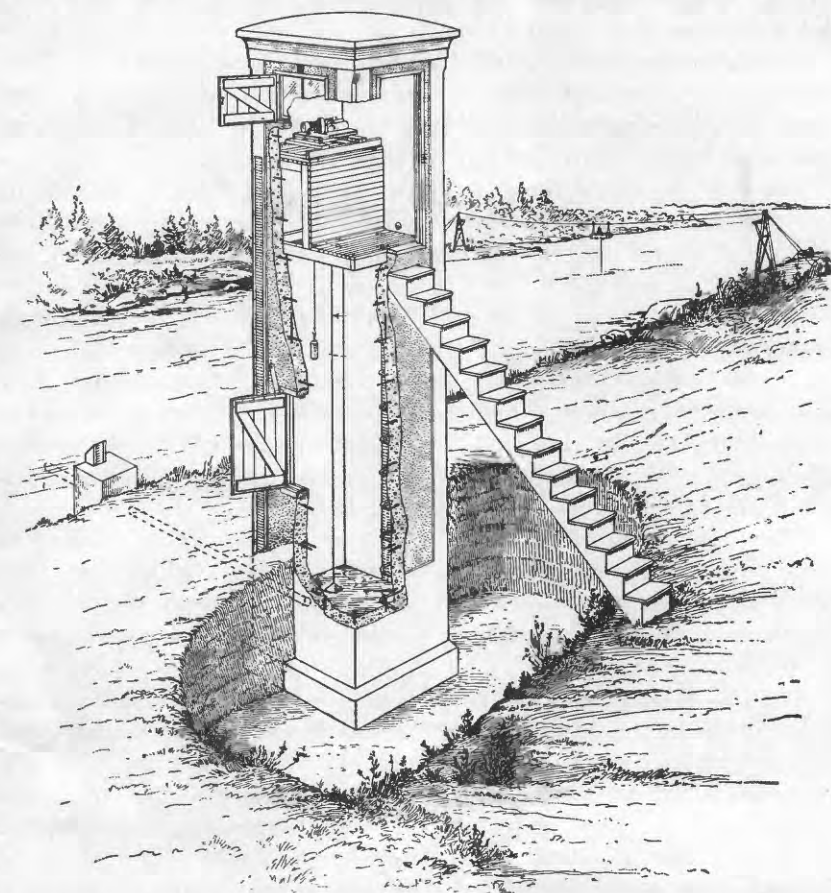


FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

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.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supple-



ment 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 non-recording 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 permanence 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 investigation 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 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.
  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, State House.  
 Boston, Mass., 945 Post Office Building.  
 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., 217 Post Office Building.  
 Columbus, Ohio, Engineering Experiment Station, Ohio State University.  
 Indianapolis, Ind., 319 Federal Building.  
 Urbana, Ill., 302 University New Agricultural Building.  
 Madison, Wis., 337N State Capitol.  
 St. Paul, Minn., 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 the 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.....	
B 140.....	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).....	1895.
W 11.....	Gage heights (also gage 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.....	1907-8.
W 261 to 272.....	do.....	1909.
W 281 to 292.....	do.....	1910.
W 301 to 312.....	do.....	1911.
W 321 to 332.....	do.....	1912.

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

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

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.

Numbers of water-supply papers containing results of stream measurements, 1899-1932  
(For basins included see p. 6)

Year	1	2	3	4	5	6	7	8	9	10	11	12-A	12-B	12-C
1899 <sup>a</sup>	35	35, 36	36	36	36	36, 37	37	37	37	38	38	38	38	38
1900 <sup>a</sup>	47, 48	65, 75	48, 49	49	49	49, 50	50	50	50	51	51	51	51	51
1901 <sup>a</sup>	65, 75	65, 75	65, 75	65, 75	65, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902 <sup>a</sup>	82	82, 83	82, 83	82, 83	82, 83	83, 84	83, 84	83, 84	83, 84	83, 84	83, 84	83, 84	83, 84	83, 84
1903 <sup>a</sup>	97	97, 98	98	97	98	99	98, 99	98	98	100	100	100	100	100
1904 <sup>a</sup>	124, 125	126, 127	128	129	128, 130	130, 131	128, 131	132	133	133, 134	134	135	135	135
1905 <sup>a</sup>	165, 166	167, 168	169	170	171	172	169, 173	174	175, 177	176, 177	177	178	178	177, 178
1906 <sup>a</sup>	201, 202	203, 204	205	206	207	208	205, 209	210	211, 213	211, 213	213	214	214	214
1907-8 <sup>a</sup>	241	242	243	244	245	246	247	248	249	250, 251	251	252	252	252
1908 <sup>a</sup>	261	262	263	264	265	266	267	268	269	270	271	272	272	272
1909 <sup>a</sup>	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1910 <sup>a</sup>	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1911 <sup>a</sup>	321	322	323	324	325	326	327	328	329	330	331	332	332	332
1912 <sup>a</sup>	341	342	343	344	345	346	347	348	349	350	351	352	352	352
1913 <sup>a</sup>	361	362	363	364	365	366	367	368	369	370	371	372	372	372
1914 <sup>a</sup>	381	382	383	384	385	386	387	388	389	390	391	392	392	392
1915 <sup>a</sup>	401	402	403	404	405	406	407	408	409	410	411	412	412	412
1916 <sup>a</sup>	431	432	433	434	435	436	437	438	439	440	441	442	442	442
1917 <sup>a</sup>	451	452	453	454	455	456	457	458	459	460	461	462	462	462
1918 <sup>a</sup>	471	472	473	474	475	476	477	478	479	480	481	482	482	482
1919-20 <sup>a</sup>	501	502	503	504	505	506	507	508	509	510	511	512	512	512
1921 <sup>a</sup>	521	522	523	524	525	526	527	528	529	530	531	532	532	532
1922 <sup>a</sup>	541	542	543	544	545	546	547	548	549	550	551	552	552	552
1923 <sup>a</sup>	561	562	563	564	565	566	567	568	569	570	571	572	572	572
1924 <sup>a</sup>	581	582	583	584	585	586	587	588	589	590	591	592	592	592
1925 <sup>a</sup>	601	602	603	604	605	606	607	608	609	610	611	612	612	612
1926 <sup>a</sup>	621	622	623	624	625	626	627	628	629	630	631	632	632	632
1927 <sup>a</sup>	641	642	643	644	645	646	647	648	649	650	651	652	652	652
1928 <sup>a</sup>	661	662	663	664	665	666	667	668	669	670	671	672	672	672
1929 <sup>a</sup>	681	682	683	684	685	686	687	688	689	690	691	692	692	692
1930 <sup>a</sup>	696	697	698	699	700	701	702	703	704	705	706	707	707	707
1931 <sup>a</sup>	711	712	713	714	715	716	717	718	719	720	721	722	722	722
1932 <sup>a</sup>	726	727	728	729	730	731	732	733	734	735	736	737	737	737

<sup>a</sup> Rating tables and index to Water-Supply Papers 35-39 contained in Water-Supply Paper 38. Tables of monthly discharge for 1899 in Twenty-first Annual Report, part 4.

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

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

<sup>h</sup> Wisconsin and Schuykill Rivers to James River.

<sup>i</sup> Gato River.

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

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

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

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

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

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

<sup>p</sup> Susquehanna River to Yachin River, inclusive.

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

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

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

<sup>t</sup> Rogue, Umpqua, and Siletz Rivers only.

## COOPERATION

The work was done under cooperative agreements with the several States as follows: In Idaho with the Department of Reclamation, R. W. Faris, commissioner; in Montana with the office of the State engineer, J. S. James; in Washington with the Department of Conservation and Development, E. J. Barnes, director, and C. J. Bartholet, supervisor of hydraulics, Division of Water Resources; with the cities of Aberdeen, Seattle, and Tacoma; with King and Pierce Counties, through the Intercounty River Improvement Commission; and with Skagit County and Wenatchee Reclamation District.

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

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

Assistance in collecting the records was also rendered by the following municipalities, corporations, and individuals: In Idaho by the city of Sandpoint, Washington Water Power Co., and Cynide Gold Mining Co.; in Montana by the Rocky Mountain Power Co.; in Washington by the Chelan Electric Co., Grays Harbor Railway & Light Co., Great Northern Power Co., Hugh L. Cooper Co., the Northwestern Power & Light Co., Washington Electric Co., West Coast Power Co., the Puget Sound Power & Light Co., Sanderson-Porter, the Sheep Creek Hydroelectric Co., the Washington Water Power Co., and the Western Washington Electric Light & Power Co.

## DIVISION OF WORK

The data for stations in the several States were collected and prepared for publication as follows: In Idaho (except Clark Fork at Priest River) and on Clark Fork near Heron, Mont., and Kootenai River near Rexford, Mont., by T. R. Newell, district engineer, assisted by F. M. Veatch, F. C. Christopherson, R. G. Kasel, F. C. Craig, J. A. Allis, P. C. Benedict, L. R. Sawyer, J. R. Throckmorton, W. I. Travis, Miss E. H. Hauge, and Miss Josephine Ruick; in Montana,

except those noted above, 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; in Washington and for Clark Fork at Priest River, Idaho, by G. L. Parker, district engineer, assisted by D. J. F. Calkins, R. B. Kilgore, O. B. Johnson, G. M. T'ayer, H. C. Woster, Frank Stermitz, J. P. Bonner, L. I. Meyer, R. J. Swanson, A. P. Martinson, and A. R. Haynes.



## GAGING-STATION RECORDS

## BASINS BETWEEN COLUMBIA RIVER AND PUGET SOUND

## NASELLE RIVER BASIN

## NASELLE RIVER NEAR NASELLE, WASH.

LOCATION.—Staff gage in SW $\frac{1}{4}$  sec. 1, T. 10 N., R. 9 W.,  $\frac{1}{2}$  miles above Salmon Creek and  $3\frac{1}{2}$  miles east of Naselle.

DRAINAGE AREA.—66 square miles.

RECORDS AVAILABLE.—May 1929 to September 1932.

EXTREMES.—Maximum discharge during year, about 5,000 second-feet Feb. 26 (gage height, 10.6 feet); minimum, 36 second-feet Aug. 8, Sept. 15, 16, 30 (gage height, 1.89 feet).

1929-32: Maximum discharge, that of Feb. 26, 1932; minimum, 22 second-feet Oct. 6, 7, 1929 (gage height, 1.75 feet).

REMARKS.—Records excellent except those of discharge above 2,000 second-feet, 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	222	620	293	1,220	263	1,060	1,110	222	88	41	56	70
2	184	540	293	1,060	249	1,000	900	209	90	47	52	67
3	160	463	278	800	235	900	850	209	94	138	46	54
4	293	408	263	705	235	950	1,000	196	101	107	44	52
5	444	373	263	660	222	4,330	1,400	184	114	73	42	50
6	308	482	324	750	235	2,200	1,110	172	90	58	41	49
7	249	705	1,060	660	373	1,340	900	160	86	54	38	47
8	222	800	1,110	660	620	900	850	149	83	54	45	52
9	196	1,400	800	950	900	660	750	149	73	52	149	47
10	184	1,340	705	1,000	1,520	540	620	138	70	99	160	41
11	172	900	620	2,600	1,110	482	540	136	70	126	160	44
12	160	750	540	1,940	900	408	444	126	68	97	149	42
13	138	1,340	501	1,580	705	340	390	122	64	79	120	41
14	132	1,580	463	1,000	620	356	356	118	62	81	108	40
15	118	1,220	426	660	540	263	324	114	62	90	94	37
16	118	1,000	850	580	444	482	340	110	67	110	86	42
17	116	900	2,860	705	390	1,110	501	105	68	83	78	42
18	94	1,000	2,990	4,330	356	1,060	750	101	70	73	73	41
19	90	2,860	2,720	2,580	324	1,340	2,080	110	67	70	70	52
20	99	1,820	2,080	1,580	900	1,000	1,160	120	58	65	68	128
21	235	1,110	1,340	1,110	2,460	750	800	105	54	59	67	99
22	1,000	800	1,110	800	1,580	660	620	114	54	56	64	54
23	850	620	900	660	1,110	900	540	136	53	56	60	53
24	1,000	540	1,640	660	1,400	1,820	483	114	52	58	59	44
25	1,000	540	1,340	580	2,010	1,580	408	105	50	58	56	42
26	1,280	426	1,160	444	4,490	1,110	356	99	46	56	53	41
27	2,080	390	1,220	408	2,460	1,000	324	92	46	53	52	40
28	2,790	356	1,220	373	1,760	1,220	293	88	44	52	52	38
29	1,820	324	1,000	340	1,220	1,220	263	86	42	78	62	38
30	1,000	293	900	324	1,220	235	235	86	41	78	83	36
31	705	-----	1,000	293	-----	1,110	-----	86	-----	58	75	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	2,790	90	563	8.53	9.83	34,600
November	2,860	293	863	13.1	14.62	51,400
December	2,990	263	1,040	15.8	18.22	64,000
January	4,330	293	1,030	15.6	17.99	63,300
February	4,490	222	1,020	15.5	16.72	58,700
March	4,330	263	1,070	16.2	18.68	65,800
April	2,080	235	689	10.4	11.60	41,000
May	222	86	131	1.98	2.28	8,060
June	114	41	67.6	1.02	1.14	4,020
July	138	41	72.9	1.10	1.27	4,480
August	160	38	76.2	1.15	1.33	4,690
September	128	36	50.8	.770	.86	3,020
The year	4,490	36	556	8.42	114.54	403,000

## NORTH RIVER BASIN

## NORTH RIVER NEAR RAYMOND, WASH.

LOCATION.—Water-stage recorder in sec. 6, T. 15 N., R. 9 W.,  $1\frac{1}{4}$  miles above Salmon Creek and 10 miles northwest of Raymond.

RECORDS AVAILABLE.—August 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 11,000 second-feet Feb. 27 (gage height, 8.11 feet); minimum, 39 second-feet Sept. 9.

1927-32: Maximum discharge, that of Feb. 27, 1932; minimum, 3 second-feet Sept. 25, 26, 1930 (gage height, -0.11 foot); results of regulation.

REMARKS.—Records excellent. Splash dam 800 feet above gage operated at irregular intervals. Many discharge measurements furnished by Western Washington Electric Light & Power Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,890	1,880	630	2,310	922	3,180	2,160	662	200	92	91	75
2	725	1,080	612	2,380	841	2,780	2,160	657	212	96	90	76
3	389	1,310	600	1,890	792	2,460	2,020	667	733	164	90	79
4	449	776	595	1,660	757	2,460	2,020	573	234	270	89	82
5	390	684	570	1,550	732	5,770	2,460	516	223	251	86	82
6	307	762	550	1,550	744	7,530	2,620	480	159	168	84	81
7	415	1,070	950	1,440	869	6,460	2,310	322	64	105	83	908
8	392	1,200	2,020	1,270	1,450	3,450	2,090	174	77	69	83	216
9	330	1,900	2,140	1,720	2,410	2,310	1,960	265	92	77	83	42
10	343	3,190	1,700	2,020	3,610	1,770	1,660	310	97	80	88	46
11	337	2,480	1,490	4,080	3,610	1,500	1,440	1,040	106	88	110	50
12	1,070	1,640	1,340	6,080	2,700	1,280	1,270	405	111	105	136	52
13	316	2,790	1,260	5,240	2,240	1,130	1,120	218	108	118	134	55
14	274	3,890	1,330	2,940	1,830	1,070	1,050	260	434	129	796	55
15	258	3,190	1,010	2,090	1,550	1,030	994	304	98	131	133	55
16	249	2,420	1,010	1,720	1,330	1,010	914	272	97	131	91	56
17	249	2,210	2,760	1,640	1,150	1,510	1,060	229	95	129	90	57
18	240	2,210	5,680	3,870	1,030	2,240	1,340	729	100	124	86	57
19	176	3,620	7,660	5,590	938	2,310	2,580	210	104	117	85	60
20	175	4,520	6,080	5,130	1,220	2,090	3,180	207	105	112	84	63
21	202	3,550	3,820	3,610	3,600	1,770	2,020	257	105	108	83	60
22	413	2,070	2,780	2,460	5,360	1,550	1,500	1,040	112	104	82	68
23	2,330	1,540	2,310	1,890	4,080	1,600	1,190	399	117	101	77	75
24	2,790	1,260	2,460	1,550	3,020	2,800	1,030	334	773	98	77	76
25	3,360	1,120	2,700	1,440	3,700	4,080	938	252	177	90	79	74
26	3,800	1,040	2,700	1,390	7,800	3,520	774	144	112	82	79	73
27	4,160	918	2,620	1,310	9,800	2,780	792	120	106	84	78	72
28	5,880	798	2,860	1,230	7,800	2,700	714	133	102	83	75	70
29	6,480	720	2,620	1,140	4,590	2,540	667	144	100	85	72	70
30	4,500	672	2,160	1,090	-----	2,620	662	157	96	90	72	68
31	2,640	-----	2,090	1,010	-----	2,380	-----	173	-----	91	73	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6,480	175	1,470.	90,400
November	4,520	672	1,880.	112,000
December	7,660	550	2,220.	136,000
January	6,080	1,010	2,400.	148,000
February	9,800	732	2,780.	160,000
March	7,530	1,010	2,630.	162,000
April	3,180	662	1,560.	92,800
May	1,040	120	376.	23,100
June	773	64	175.	10,400
July	270	69	115.	7,070
August	796	72	112.	6,890
September	908	42	98.4	5,860
The year	9,800	42	1,310	955,000

## CHEHALIS RIVER BASIN

## CHEHALIS RIVER NEAR GRAND MOUND, WASH.

LOCATION.—Staff gage in NW¼ sec. 23, T. 15 N., R. 3 W., at Meadow, 1½ miles southwest of Grand Mound.

DRAINAGE AREA.—928 square miles.

RECORDS AVAILABLE.—October 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 21,800 second-feet Feb. 27 (gage height, 11.29 feet); minimum, 209 second-feet Aug. 7-8 (gage height, 0.14 foot).

1928-32: Maximum discharge, that of Feb. 27, 1932; minimum, 147 second-feet Aug. 29, 1930 (gage height, 0.04 foot).

REMARKS.—Records good. Cities of Chehalis and Centralia divert about 15 second-feet from Newaukum River, a tributary, for municipal use. No noticeable regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	385	1,890	1,370	6,550	1,890	10,000	5,120	1,780	720	390	248	248
2	340	1,750	1,370	6,150	1,620	8,930	5,120	2,440	720	420	248	265
3	320	1,490	1,430	4,780	1,560	7,240	5,870	1,900	810	450	248	248
4	320	1,250	1,490	4,030	1,490	7,240	5,870	1,780	720	680	230	230
5	530	1,140	1,490	3,670	1,490	12,700	7,440	1,550	765	570	223	230
6	565	1,030	1,310	3,850	1,560	19,700	8,710	1,550	720	480	212	230
7	440	2,490	3,490	3,490	1,890	16,700	7,240	1,380	680	420	209	230
8	385	2,980	7,350	3,150	3,320	9,370	6,060	1,330	640	390	209	226
9	360	4,030	6,950	4,210	4,500	7,240	4,940	1,220	605	365	230	230
10	340	9,840	5,350	4,030	9,420	5,300	4,220	1,160	510	390	282	226
11	340	6,550	4,210	5,950	8,790	4,220	3,520	1,110	605	605	340	226
12	340	4,210	3,150	14,600	7,350	3,350	3,030	1,060	605	540	320	226
13	340	3,490	2,980	10,900	6,550	3,030	2,730	1,000	640	510	300	226
14	340	6,350	2,980	7,350	4,970	2,730	2,730	950	570	450	282	226
15	320	5,160	2,180	5,750	3,850	2,880	2,440	900	570	510	265	223
16	320	4,780	2,030	4,590	2,980	2,880	2,300	855	570	480	248	216
17	360	4,780	3,850	3,670	2,490	4,580	2,880	855	540	450	248	212
18	360	6,350	12,500	7,950	2,030	6,250	4,040	855	570	390	248	220
19	340	7,150	13,200	15,800	1,890	8,280	6,840	855	605	365	230	230
20	340	12,500	12,500	15,600	2,180	6,640	7,860	1,000	605	340	248	265
21	340	8,790	10,300	12,200	12,500	5,120	5,680	1,000	570	340	265	340
22	440	5,750	7,950	8,580	14,100	4,220	4,400	950	540	320	265	282
23	2,810	4,210	6,350	5,950	9,840	4,220	3,520	855	510	300	265	265
24	4,030	3,150	7,950	4,590	7,350	7,240	3,350	855	510	300	265	248
25	2,810	2,810	7,950	3,670	7,150	11,600	3,030	810	480	300	248	248
26	4,210	2,650	6,750	3,150	15,800	9,590	2,580	810	510	282	248	248
27	3,670	2,180	9,420	3,150	21,800	7,650	2,300	765	450	282	230	248
28	7,150	1,890	8,790	2,650	18,400	8,070	2,030	720	420	265	230	248
29	6,350	1,620	6,750	2,490	14,000	7,860	1,900	680	450	265	223	248
30	3,850	1,490	5,350	2,330	-----	6,840	1,780	720	420	265	230	248
31	2,650	-----	5,350	2,180	-----	5,870	-----	765	-----	265	265	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	7,150	320	1,470	1.58	1.82	90,400
November	12,500	1,030	4,120	4.44	4.95	245,000
December	13,200	1,310	5,610	6.05	6.98	345,000
January	15,800	2,180	6,030	6.50	7.49	371,000
February	21,800	1,490	6,650	7.17	7.73	383,000
March	19,700	2,730	7,340	7.91	9.12	451,000
April	8,710	1,780	4,320	4.66	5.20	257,000
May	2,440	680	1,110	1.20	1.38	68,200
June	810	420	588	.634	.71	35,000
July	680	265	399	.430	.50	24,500
August	340	209	252	.272	.31	15,500
September	340	212	242	.261	.29	14,400
The year	21,800	209	3,170	3.42	46.48	2,300,000

## SATSOP RIVER NEAR SATSOP, WASH.

LOCATION.—Staff gage in sec. 36, T. 18 N., R. 7 W., 1 mile west of Satsop

DRAINAGE AREA.—315 square miles.

RECORDS AVAILABLE.—March 1929 to September 1932.

EXTREMES.—Maximum discharge during year, about 27,000 second-feet Feb. 26 (gage height, 15.8 feet); minimum, 242 second-feet Sept. 16–18, 25, 26.

1929–32: Maximum discharge, that of Feb. 26, 1932; minimum, 203 second-feet Sept. 21, 22, 1930.

REMARKS.—Records good. No diversions or regulation.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	2,050	2,520	1,330	5,000	1,620	5,850	5,280	1,490	610	385	385	320
2.....	1,330	2,400	1,420	4,300	1,520	5,000	4,680	1,390	610	385	362	300
3.....	990	2,160	1,620	3,770	1,420	4,300	4,020	1,300	585	510	340	320
4.....	1,240	1,940	1,520	3,510	1,330	4,720	4,160	1,300	585	435	340	300
5.....	2,400	1,720	1,620	3,380	1,420	14,400	4,020	1,160	560	410	320	280
6.....	1,620	1,720	1,620	3,770	1,520	7,250	4,020	1,120	560	385	320	280
7.....	1,240	3,900	3,250	3,250	1,720	5,420	4,020	1,040	535	385	320	280
8.....	1,030	3,120	3,380	3,000	2,520	4,300	3,740	1,040	535	362	340	280
9.....	910	5,590	2,760	4,860	3,640	3,740	3,460	960	535	362	435	280
10.....	805	4,440	2,640	4,300	4,720	3,200	3,070	922	510	460	510	280
11.....	740	3,380	2,160	18,100	3,510	2,940	2,690	922	510	485	460	260
12.....	680	3,000	1,940	8,150	3,000	2,570	2,450	850	510	510	435	260
13.....	625	11,300	1,830	5,290	2,520	2,450	2,330	815	485	460	435	260
14.....	600	9,250	1,620	4,160	2,280	2,570	2,330	815	485	435	435	260
15.....	575	5,290	1,520	3,640	2,050	2,450	2,110	782	485	460	410	260
16.....	550	4,300	1,620	3,250	1,830	2,450	2,220	750	460	535	385	242
17.....	525	4,300	15,800	3,000	1,720	5,560	3,200	750	460	485	385	242
18.....	500	4,030	18,600	12,400	1,520	6,930	4,020	720	460	460	385	242
19.....	500	9,050	20,600	10,700	1,420	5,000	6,930	782	460	460	410	320
20.....	480	5,590	7,970	6,490	2,280	4,440	4,720	815	460	435	410	320
21.....	480	4,160	6,490	4,860	4,860	3,600	3,600	815	485	410	385	300
22.....	1,620	3,380	5,740	4,030	3,770	3,740	2,940	815	460	385	385	260
23.....	2,640	2,880	5,140	3,380	5,290	3,880	2,570	815	460	385	362	260
24.....	4,580	2,400	6,970	3,000	7,130	8,050	2,450	750	435	385	340	260
25.....	5,740	2,160	6,190	2,880	11,800	6,930	2,220	720	410	385	340	242
26.....	4,300	2,050	5,440	2,760	27,000	5,420	2,110	690	410	385	340	242
27.....	5,290	1,830	5,440	2,400	17,800	5,420	1,690	662	410	362	320	260
28.....	6,810	1,620	5,140	2,160	9,440	5,420	1,590	635	410	362	320	260
29.....	4,720	1,520	4,300	2,050	7,090	4,720	1,490	635	385	435	300	260
30.....	3,380	1,420	4,030	1,940	-----	5,280	1,490	635	385	410	300	260
31.....	2,760	-----	4,580	1,720	-----	5,700	-----	635	-----	385	320	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	6,810	480	1,990	6.32	7.29	122,000
November.....	11,300	1,420	3,750	11.9	13.28	223,000
December.....	20,600	1,330	4,970	15.8	18.22	306,000
January.....	18,100	1,720	4,690	14.9	17.18	288,000
February.....	27,000	1,330	4,750	15.1	16.29	273,000
March.....	14,400	2,450	4,960	15.7	18.10	305,000
April.....	6,930	1,490	3,180	10.1	11.27	189,000
May.....	1,490	635	888	2.82	3.25	54,600
June.....	610	385	488	1.55	1.73	29,000
July.....	535	362	422	1.34	1.54	25,900
August.....	510	300	372	1.18	1.36	22,900
September.....	320	242	273	.867	.97	16,200
The year.....	27,000	242	2,560	8.13	110.48	1,850,000

## WYNOOCHEE RIVER AT OXBOW, NEAR ABERDEEN, WASH.

LOCATION.—Water-stage recorder in sec. 12, T. 21 N., R. 8 W., 1 mile below Oxbow and 24 miles northeast of Aberdeen.

DRAINAGE AREA.—65 square miles.

RECORDS AVAILABLE.—May 1925 to September 1932.

EXTREMES.—Maximum discharge during year, 12,900 second-feet Feb. 26 (gage height, 25.2 feet); minimum, 122 second-feet Sept. 30 (gage height, 2.59 feet).

1925-32: Maximum discharge, that of Feb. 26, 1932; minimum, 76 second-feet Sept. 23, 1930 (gage height, 2.09 feet).

REMARKS.—Records excellent. Discharge estimated June 8-19. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	786	1, 070	463	1, 160	473	1, 630	1, 880	812	504	376	280	170
2.....	548	980	633	968	443	1, 340	1, 700	786	483	376	284	156
3.....	443	760	708	864	433	1, 130	1, 460	734	514	453	250	150
4.....	1, 110	658	620	786	424	1, 320	1, 800	708	504	395	242	148
5.....	1, 100	633	596	986	414	3, 640	1, 880	683	463	348	234	145
6.....	683	2, 550	571	1, 100	424	1, 990	1, 460	658	433	312	227	142
7.....	536	1, 970	1, 120	890	443	1, 430	1, 370	658	424	303	212	138
8.....	453	1, 250	994	875	493	1, 190	1, 370	658	520	295	220	141
9.....	404	1, 460	786	1, 400	682	1, 050	1, 160	658		287	326	138
10.....	366	1, 220	658	1, 160	734	942	1, 050	658		439	376	136
11.....	329	994	583	5, 610	583	864	994	596	470	704	357	135
12.....	303	1, 280	536	2, 370	514	812	1, 050	583		463	320	134
13.....	287	5, 630	504	1, 490	473	786	1, 020	583		395	295	132
14.....	272	2, 330	463	1, 160	433	1, 020	1, 160	559		366	272	131
15.....	257	1, 560	433	994	414	1, 070	1, 020	514		403	257	130
16.....	242	1, 250	476	864	395	968	1, 100	504	493	658	250	129
17.....	234	1, 280	5, 460	812	376	1, 930	1, 310	525		463	234	127
18.....	227	1, 190	7, 230	3, 150	357	2, 340	1, 460	559		404	220	125
19.....	212	2, 650	8, 290	2, 380	348	1, 800	2, 400	633		366	220	204
20.....	212	1, 630	3, 340	1, 600	473	1, 370	1, 600	838		338	220	189
21.....	266	1, 190	2, 050	1, 250	1, 210	1, 130	1, 220	658	620	320	212	148
22.....	708	994	1, 740	1, 070	1, 280	1, 070	1, 020	608	571	312	212	140
23.....	1, 070	864	1, 690	916	968	1, 250	916	683	463	295	197	133
24.....	1, 570	760	2, 170	812	2, 590	2, 490	864	583	424	295	190	132
25.....	1, 660	708	1, 740	812	5, 820	2, 220	812	525	404	312	182	128
26.....	1, 160	633	1, 600	760	10, 600	1, 630	838	483	404	287	176	126
27.....	1, 710	571	1, 600	683	7, 370	1, 400	890	473	404	272	170	125
28.....	2, 010	525	1, 310	608	3, 520	2, 090	838	473	414	272	162	124
29.....	1, 310	493	1, 100	571	2, 140	1, 600	760	525	404	366	160	123
30.....	994	473	1, 020	536	-----	1, 800	760	536	386	348	160	123
31.....	838	-----	1, 160	504	-----	1, 800	-----	525	-----	303	183	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2, 010	212	719	44, 200
November.....	5, 630	473	1, 320	78, 600
December.....	8, 290	433	1, 670	103, 000
January.....	5, 610	504	1, 260	77, 500
February.....	10, 600	348	1, 550	89, 200
March.....	3, 640	786	1, 520	93, 500
April.....	2, 400	760	1, 240	73, 800
May.....	838	473	612	37, 600
June.....	620	386	475	28, 300
July.....	704	272	372	22, 900
August.....	376	160	235	14, 400
September.....	204	123	140	8, 330
The year.....	10, 600	123	923	671, 000

## QUINAUT RIVER BASIN

## QUINAUT RIVER AT QUINAUT LAKE, WASH.

LOCATION.—Water-stage recorder in sec. 25, T. 23 N., R. 10 W., at outlet of Quinault Lake, 4 miles southwest of Quinault.

DRAINAGE AREA.—264 square miles.

RECORDS AVAILABLE.—October 1911 to December 1922; July to November 1924; September 1925 to November 1932 (discontinued).

EXTREMES.—Maximum discharge during period October 1931 to November 1932, about 28,000 second-feet Feb. 27 (gage height, 13.5 feet); minimum, 399 second-feet Oct. 11, 1932 (gage height, 1.00 foot).

1911–22, 1924–32: Maximum discharge, 37,000 second-feet Dec. 12, 1921 (gage height, 16.3 feet); minimum, 285 second-feet Sept. 20, 1924.

REMARKS.—Records fair October to January, good thereafter. No diversions above station. Slight regulation caused by natural storage in lake.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1			1,410		1,410	7,360	5,390	2,830	2,420	2,690	1,510	803
2			2,000		1,360	5,580	5,390	2,900	2,350	2,690	1,460	783
3		2,250	1,900		1,280	4,280	5,010	2,830	2,420	2,900	1,410	758
4	1,800		1,850		1,230	3,870	4,820	2,830	2,480	3,040	1,410	732
5		2,550		3,200	1,210	6,350	5,390	2,760	2,420	2,690	1,460	709
6		3,930			1,250	6,350	4,820	2,690	2,160	2,350	1,460	703
7					1,310	5,200	4,820	2,760	2,030	2,160	1,410	691
8					1,460	4,110	4,030	2,690	2,030	2,030	1,360	703
9			2,350		1,680	3,480	3,560	2,690	2,220	1,970	1,360	697
10	1,300	4,900			2,030	2,970	3,180	2,760	2,620	2,280	1,460	680
11					1,970	2,690	2,900	2,690	3,260	3,110	1,460	668
12					1,850	2,480	2,970	2,550	3,710	2,830	1,410	651
13	1,060				1,730	2,280	3,040	2,480	4,200	2,550	1,310	634
14	1,010			5,050	1,510	2,480	3,330	2,420	4,370	2,280	1,230	612
15	940				1,410	2,830	3,330	2,280	4,370	2,220	1,180	601
16	875	4,350			1,300	2,760	3,330	2,160	3,790	2,690	1,160	590
17	824				1,210	3,480	3,630	2,160	3,260	2,620	1,150	579
18	783		6,700		1,120	5,010	3,870	2,280	2,900	2,350	1,100	562
19	758			6,350	1,060	5,770	5,010	2,420	2,620	2,160	1,070	618
20	732			5,390	1,180	5,200	5,200	3,260	2,620	2,030	1,060	732
21	739	4,200		4,280	1,550	4,280	4,280	3,400	3,560	1,910	1,040	732
22				3,560	2,350	3,710	3,560	3,180	4,280	1,910	1,030	703
23				2,970	2,350	3,630	3,040	3,040	3,870	1,910	1,010	668
24				2,550	3,780	4,280	2,690	2,830	3,400	1,850	985	634
25				2,420	7,560	5,580	2,480	2,550	3,040	1,970	958	612
26		2,500		2,220	20,700	5,200	2,350	2,350	2,830	1,970	940	596
27	3,450		3,950	2,090	27,200	4,370	2,550	2,160	2,760	1,850	916	579
28				1,910	18,500	4,640	2,690	2,090	2,760	1,730	883	568
29				1,790	10,800	4,820	2,690	2,160	2,900	1,730	852	557
30				1,620		4,820	2,690	2,350	2,830	1,680	817	541
31				1,510		5,010		2,420		1,620	817	

Day	Oct.	Nov.	Day	Oct.	Nov.	Day	Oct.	Nov.
1932			1932			1932		
1	525	3,120	11	435	2,900	21	1,360	
2	514	5,580	12	450	4,710	22	1,460	
3	514	5,010	13	461	13,200	23	1,460	
4	508	4,370	14	741	10,300	24	1,410	
5	494	5,680	15	1,880	8,000	25	1,410	
6	479	7,150	16	2,420	9,130	26	1,410	
7	464	5,580	17	2,160	8,900	27	1,410	
8	450	4,820	18	1,790	7,360	28	1,460	
9	435	4,110	19	1,510	6,150	29	1,510	
10	414	3,400	20	1,360		30	1,460	
						31	2,200	

*Discharge, in second-feet, of Quinault River at Quinault Lake, Wash.,  
1931-32—Continued*

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1931-32						
October		732	1,960	7.42	8.55	121,000
November			3,560	13.5	15.06	212,000
December			4,010	15.2	17.52	247,000
January		1,510	3,640	13.8	15.91	224,000
February	27,200	1,060	4,250	16.1	17.36	244,000
March	7,360	2,280	4,350	16.5	19.02	267,000
April	5,390	2,350	3,720	14.1	15.73	221,000
May	3,400	2,090	2,610	9.89	11.40	160,000
June	4,370	2,030	3,020	11.4	12.72	180,000
July	3,110	1,620	2,250	8.52	9.82	138,000
August	1,510	817	1,180	4.47	5.15	72,600
September	803	541	657	2.49	2.78	39,100
The year	27,200	541	2,930	11.1	151.02	2,130,000
1932						
October	2,420	414	1,110	4.20	4.84	68,200
November 1-19	13,200	2,900	6,290	23.8	16.82	237,000
The period						305,000

## QUEETS RIVER BASIN

## QUEETS RIVER NEAR CLEARWATER, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 36, T. 24 N., R. 13 W., on Quinalt Indian Reservation, 4 miles southwest of Clearwater. Zero of gage is 18.5 feet above mean sea level.

DRAINAGE AREA.—454 square miles.

RECORDS AVAILABLE.—September 1930 to September 1932.

EXTREMES.—Maximum discharge during year, about 70,000 second-feet Feb. 26 (gage height, 18.3 feet); minimum, 632 second-feet Sept. 18, 19 (gage height, 0.56 foot).

1930-32: Maximum discharge, that of Feb. 26, 1932; minimum, 420 second-feet Aug. 23-24, 1931.

REMARKS.—Records excellent. Discharge estimated June 26 to July 10. No diversions or regulation. Many discharge measurements furnished by Grays Harbor Railway & Light Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3,280	5,320	1,840	5,620	2,190	9,200	11,400	3,060	1,700	2,400	1,700	1,040
2.....	2,100	4,830	2,730	4,500	2,100	7,470	8,940	2,900	1,640		1,540	917
3.....	1,710	3,530	2,540	3,840	1,970	6,130	7,700	2,660	1,910	2,000	1,500	842
4.....	10,200	2,920	2,190	3,740	2,000	10,800	9,900	2,580	1,840		1,460	818
5.....	7,900	3,220	2,280	4,870	2,190	23,700	11,500	2,350	1,770	2,000	1,470	850
6.....	4,280	13,600	2,020	5,970	3,220	11,000	8,430	2,280	1,510		1,430	850
7.....	3,020	10,000	4,210	4,500	4,170	7,470	8,180	2,420	1,440	2,000	1,320	834
8.....	2,360	7,870	3,950	4,320	5,050	5,910	7,700	2,200	1,510		1,380	908
9.....	1,990	12,000	3,120	8,660	8,520	4,960	6,130	2,200	1,700	2,000	1,840	858
10.....	1,720	7,870	3,530	6,660	7,160	4,430	5,160	2,350	2,120		2,050	778
11.....	1,540	5,620	2,920	32,200	4,940	4,030	4,740	2,050	2,420	5,890	1,640	786
12.....	1,390	10,500	2,540	13,000	4,060	3,660	4,740	1,980	2,580	3,140	1,560	754
13.....	1,280	33,900	2,640	7,870	3,420	3,480	4,330	1,910	2,660	2,740	1,400	709
14.....	1,200	12,800	2,280	5,970	2,820	4,640	5,270	1,770	2,660	2,500	1,290	702
15.....	1,120	8,620	2,020	4,940	2,540	5,060	4,230	1,640	2,420	2,930	1,270	688
16.....	1,100	6,900	2,910	4,390	2,280	4,640	5,060	1,610	1,840	5,160	1,340	681
17.....	1,090	7,620	33,200	4,170	2,020	10,100	3,560	1,700	1,640	3,310	1,250	674
18.....	1,010	6,900	35,500	15,900	1,880	12,800	7,190	1,840	1,600	2,580	1,160	646
19.....	960	16,800	29,200	14,300	1,800	9,200	13,400	2,110	1,500	2,280	1,090	1,520
20.....	1,030	9,940	13,400	8,370	3,700	7,470	8,180	3,280	2,080	2,050	1,120	1,750
21.....	1,060	6,430	9,140	6,430	8,520	5,910	5,910	2,350	4,850	1,980	1,100	988
22.....	4,070	5,050	8,880	5,280	8,790	5,910	4,850	2,050	3,700	1,910	1,240	826
23.....	6,900	4,170	7,810	4,390	5,970	7,700	4,030	2,350	2,420	1,910	1,110	754
24.....	8,370	3,530	10,500	3,840	18,500	11,300	3,750	1,980	1,980	1,840	1,070	730
25.....	7,870	3,320	7,870	5,050	28,100	12,700	3,480	1,700	1,770	2,460	1,060	730
26.....	5,970	2,920	6,900	4,170	59,200	8,940	3,400	1,600	2,100	1,980	1,020	695
27.....	8,370	2,540	7,620	3,840	47,400	7,240	3,480	1,510		1,700	989	674
28.....	7,870	2,280	6,660	3,420	19,500	10,900	3,140	1,580	2,100	1,640	953	681
29.....	5,970	2,100	5,510	3,020	12,200	8,680	2,900	1,840		2,200	899	674
30.....	4,610	1,940	4,940	2,730	-----	12,500	2,980	1,910	2,100	1,980	908	660
31.....	3,740	-----	5,050	2,540	-----	10,900	-----	1,770		1,640	944	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	10,200	960	3,710	8.17	9.42	228,000
November.....	33,900	1,940	7,470	16.5	18.41	444,000
December.....	35,500	1,840	7,610	16.8	19.37	468,000
January.....	32,200	2,540	6,730	14.8	17.06	414,000
February.....	59,200	1,800	9,520	21.0	22.65	548,000
March.....	23,700	3,480	8,350	18.4	21.21	513,000
April.....	13,400	2,900	6,220	13.7	15.29	370,000
May.....	3,280	1,510	2,110	4.65	5.36	130,000
June.....	4,850	1,440	2,130	4.69	5.23	127,000
July.....	5,890	-----	2,450	5.40	6.23	151,000
August.....	2,050	899	1,290	2.84	3.27	79,300
September.....	1,750	646	834	1.84	2.05	49,600
The year.....	59,200	646	4,850	10.7	145.55	3,520,000



## CLEARWATER RIVER NEAR CLEARWATER, WASH.

LOCATION.—Staff gage in NW¼ sec. 18, T. 24 N., R. 12 W., 1½ miles north of Clearwater and 3 miles above mouth.

DRAINAGE AREA.—142 square miles.

RECORDS AVAILABLE.—October 1931 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, about 21,000 second-feet Feb. 26 (gage height, 15.5 feet); minimum, 130 second-feet Sept. 17.

REMARKS.—Records fair October to December; good January to September, except for discharges above 2,000 second-feet, which are poor. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,180	1,430	685	1,900	640	2,300	3,200	580	217	150	448	256
2.....	805	1,430	865	1,530	580	2,000	2,520	550	230	160	402	206
3.....	655	1,180	775	1,350	550	1,620	2,100	495	230	402	360	242
4.....	3,200	945	715	1,260	550	2,300	2,740	470	230	425	320	320
5.....	2,430	1,020	745	1,710	640	5,270	3,080	448	284	269	284	217
6.....	1,610	3,800	655	2,000	1,040	2,850	2,520	425	242	230	256	183
7.....	1,180	2,740	1,420	1,530	1,440	2,200	2,300	402	217	194	269	161
8.....	875	2,530	1,270	1,350	1,710	1,710	2,200	380	206	183	300	172
9.....	745	4,190	1,060	2,410	3,080	1,440	1,800	360	194	183	550	172
10.....	625	2,530	1,340	2,200	1,530	1,260	1,620	360	194	735	495	172
11.....	542	1,970	1,060	9,730	1,800	1,120	1,350	340	194	1,580	448	161
12.....	465	2,960	990	3,800	1,530	1,000	1,260	320	194	805	402	150
13.....	400	7,080	990	2,300	1,260	960	1,080	300	183	670	360	150
14.....	380	3,440	925	1,800	1,000	1,260	1,350	284	172	580	340	150
15.....	345	2,600	865	1,530	840	1,350	1,080	284	172	735	320	150
16.....	330	2,150	990	1,350	700	1,260	1,350	269	161	1,260	300	140
17.....	330	2,420	12,100	1,170	640	3,080	1,710	256	150	840	284	130
18.....	300	2,150	9,390	4,450	550	3,560	1,800	242	150	640	269	425
19.....	271	4,850	6,760	3,440	520	2,410	3,560	495	150	550	242	1,080
20.....	330	2,790	3,440	2,630	1,620	2,100	2,300	425	230	470	256	340
21.....	285	2,150	2,740	2,100	2,740	1,800	1,800	340	580	425	269	256
22.....	1,100	1,740	2,630	1,710	2,850	1,710	1,440	470	735	402	242	217
23.....	2,630	1,500	2,300	1,350	2,100	2,200	1,170	448	242	425	230	206
24.....	2,740	1,270	2,740	1,350	6,760	2,960	1,040	320	217	380	230	194
25.....	2,430	1,270	2,410	1,710	8,710	3,440	960	284	194	610	217	183
26.....	1,970	1,060	2,100	1,440	20,400	2,520	840	300	183	425	260	172
27.....	2,530	925	2,300	1,260	11,100	2,100	770	269	172	360	194	161
28.....	2,240	865	2,100	1,080	4,060	2,850	700	242	172	380	194	161
29.....	1,790	805	1,800	960	2,850	2,520	640	242	161	380	194	150
30.....	1,430	745	1,620	840	-----	3,440	610	230	150	300	206	150
31.....	1,100	-----	1,710	735	-----	2,960	-----	230	-----	425	217	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	3,200	271	1,200	8.45	9.74	73,800
November.....	7,080	745	2,220	15.6	17.40	132,000
December.....	12,100	655	2,510	16.3	18.79	142,000
January.....	9,730	735	2,060	14.5	16.72	127,000
February.....	20,400	520	2,590	20.4	22.00	166,000
March.....	5,270	960	2,240	15.8	18.22	138,000
April.....	3,560	230	1,700	12.0	13.39	101,000
May.....	580	357	227	2.51	2.89	22,000
June.....	735	150	227	1.60	1.78	13,500
July.....	1,530	150	500	3.52	4.06	30,700
August.....	550	194	300	2.11	2.43	18,400
September.....	1,080	130	228	1.61	1.80	13,600
The year.....	20,400	130	1,350	9.51	129.22	978,000

## HOH RIVER BASIN

## HOH RIVER NEAR SPRUCE, WASH.

LOCATION.—Water-stage recorder in sec. 34, T. 27 N., R. 11 W., 2¼ miles below Spruce and 5 miles below South Fork.

DRAINAGE AREA.—193 square miles.

RECORDS AVAILABLE.—August 1926 to September 1932.

EXTREMES.—Maximum discharge during year, 22,800 second-feet Feb. 26 (gauge height, 15.4 feet); minimum, 554 second-feet Oct. 19 (gauge height, 2.32 feet).

1926-32: Maximum discharge, that of Feb. 26, 1932; minimum, 247 second-feet Nov. 14, 15, 1929 (gauge height, 1.49 feet).

REMARKS.—Records good. No diversions or artificial regulation. Stream subject to large diurnal fluctuation caused by melting of glaciers.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,330	3,060	1,080	1,610	950	3,930	3,600	1,970	1,560	1,970	1,220	996
2	1,030	2,440	1,380	1,400	900	3,270	3,270	1,890	1,530	1,970	1,280	886
3	780	1,690	1,230	1,280	900	2,770	2,970	1,780	1,740	2,470	1,370	868
4	3,060	1,550	1,110	1,250	876	3,200	3,270	1,780	1,700	2,450	1,500	886
5	2,540	1,880	1,050	1,630	876	5,890	3,490	1,700	1,460	1,780	1,640	1,040
6	1,390	6,670	1,020	1,640	925	3,820	2,870	1,670	1,250	1,530	1,640	1,120
7	1,050	4,840	1,490	1,370	1,020	2,970	2,570	1,740	1,220	1,430	1,500	1,040
8	925	3,290	1,350	1,560	1,050	2,480	2,390	1,640	1,370	1,430	1,460	1,140
9	850	3,670	1,230	2,290	1,400	2,210	2,130	1,670	1,640	1,370	1,500	950
10	803	2,830	1,200	1,970	1,370	2,090	2,050	1,850	2,090	2,790	1,400	928
11	736	2,300	1,050	9,110	1,190	1,930	2,090	1,640	2,570	2,780	1,220	928
12	715	3,760	1,020	4,780	1,080	1,810	2,300	1,560	2,870	1,970	1,200	827
13	673	9,850	975	3,120	1,000	1,850	2,300	1,560	2,970	1,780	1,120	790
14	652	5,090	900	2,440	925	2,210	2,480	1,460	3,070	1,850	1,100	866
15	652	3,670	875	2,060	876	2,170	2,130	1,370	2,670	2,050	1,220	827
16	673	2,940	1,200	1,840	829	1,890	2,260	1,310	2,090	2,680	1,370	846
17	673	3,050	6,950	1,770	784	2,570	2,300	1,370	1,810	1,970	1,280	808
18	632	2,720	8,780	4,620	762	3,550	2,490	1,530	1,670	1,640	1,200	702
19	592	4,700	9,280	4,000	740	3,380	3,490	1,870	1,600	1,500	1,120	968
20	673	3,410	5,240	2,820	852	2,770	2,670	2,440	2,610	1,530	1,120	971
21	660	2,610	3,570	2,340	1,370	2,300	2,210	1,850	4,800	1,640	1,170	754
22	1,180	2,160	3,180	1,960	1,580	2,210	1,930	1,640	3,500	1,780	1,100	685
23	1,820	1,890	2,960	1,720	1,390	2,480	1,740	1,670	2,570	1,740	1,140	685
24	2,400	1,690	3,570	1,610	4,140	3,180	1,640	1,460	2,090	1,740	1,220	771
25	2,250	1,660	2,760	1,640	7,320	3,710	1,560	1,280	1,890	2,130	1,340	729
26	1,890	1,480	2,440	1,470	19,900	2,970	1,700	1,200	1,850	1,700	1,240	685
27	2,390	1,320	2,600	1,400	17,500	2,670	1,850	1,140	1,970	1,560	1,140	754
28	2,830	1,260	2,100	1,250	8,180	3,490	1,780	1,220	2,130	1,560	1,100	808
29	2,560	1,170	1,760	1,160	5,210	2,970	1,700	1,460	2,170	1,600	973	808
30	2,020	1,110	1,680	1,130	-----	3,170	1,850	1,600	1,970	1,430	973	771
31	1,890	-----	1,640	1,020	-----	3,170	-----	1,560	-----	1,250	950	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	3,060	592	1,370	7.10	8.19	84,200
November	9,850	1,110	2,990	15.5	17.29	178,000
December	9,280	875	2,470	12.8	14.76	152,000
January	9,110	1,020	2,230	11.6	13.37	137,000
February	19,900	740	2,960	15.3	16.50	170,000
March	5,890	1,810	2,880	14.9	17.18	177,000
April	3,600	1,560	2,370	12.3	13.72	141,000
May	2,440	1,140	1,610	8.34	9.62	99,000
June	4,800	1,220	2,150	11.1	12.38	128,000
July	2,790	1,250	1,840	9.53	10.99	113,000
August	1,640	950	1,250	6.48	7.47	76,900
September	1,140	685	859	4.45	4.96	51,100
The year	19,900	592	2,080	10.8	146.43	1,510,000

## ELWHA RIVER BASIN

## ELWHA RIVER AT McDONALD BRIDGE, NEAR PORT ANGELES, WASH.

**LOCATION.**—Water-stage recorder in NE¼NW¼ sec. 33, T. 30 1', R. 7 W., at McDonald Bridge, 8 miles southwest of Port Angeles. Zero of gage is 206.29 feet above mean sea level.

**DRAINAGE AREA.**—262 square miles.

**RECORDS AVAILABLE.**—October 1897 to December 1901; October 1918 to September 1932.

**EXTREMES.**—Maximum discharge during year, 12,200 second-feet Feb. 26 (gage height, 8.37 feet); minimum, 10 second-feet Sept. 18 (gage height, 0.26 foot); result of regulation.

1897-1901, 1918-32: Maximum discharge, 23,800 second-feet Nov. 27, 1901 (gage height, 10.6 feet); minimum discharge, 8 second-feet Oct. 9, 1927 (gage height, -0.07 foot); result of regulation.

**REMARKS.**—Records good. Discharge July 2-12 estimated from records of power-plant load and estimated inflow. Flow regulated by operation of Glines Canyon Reservoir for power. Flow that is diverted through power house is returned to river above gage. Many discharge measurements furnished by Northwestern Power & Light Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	481	1,730	1,180	1,440	694	3,580	2,220	1,230	2,110	2,610	914	336
2-----	778	1,330	1,330	761	1,060	2,820	2,140	2,090	2,070	2,640	1,490	351
3-----	658	1,230	1,430	330	1,120	2,370	1,950	2,070	2,130	2,700	1,600	364
4-----	528	1,170	983	846	1,030	2,390	1,980	2,200	2,240	2,500	1,500	313
5-----	357	1,090	558	1,140	1,030	2,980	2,020	2,220	1,960	1,730	1,460	135
6-----	492	3,100	76	1,190	1,090	2,620	1,670	2,270	1,560	1,650	709	144
7-----	575	2,830	634	1,140	1,170	2,050	1,730	2,310	1,990	1,510	116	443
8-----	512	1,690	1,100	1,050	1,160	2,030	1,500	2,310	3,190	1,150	218	658
9-----	626	1,570	1,060	554	1,200	1,830	1,440	2,230	1,760	1,600	316	612
10-----	433	1,430	1,150	726	1,190	1,760	1,630	2,610	1,730	2,570	344	448
11-----	116	1,220	977	3,810	530	1,480	1,530	2,330	3,590	1,700	436	492
12-----	354	1,560	698	2,790	92	1,470	1,900	2,180	3,670	1,620	903	846
13-----	548	5,530	68	1,880	90	1,390	1,830	2,260	4,040	1,700	1,100	1,090
14-----	578	2,630	601	1,600	90	1,760	2,090	2,080	4,090	1,580	1,120	1,070
15-----	563	939	964	1,580	588	1,900	1,740	2,000	3,820	1,530	1,100	1,000
16-----	714	1,860	1,060	1,180	989	1,510	1,900	1,900	3,170	2,030	1,140	1,010
17-----	303	1,610	1,500	1,090	932	1,400	1,890	1,770	2,690	1,390	1,080	619
18-----	213	1,600	2,770	2,440	956	2,350	1,720	2,110	2,550	1,400	736	11
19-----	491	1,730	4,950	2,030	986	2,540	1,760	2,210	2,430	1,250	303	50
20-----	528	1,580	3,430	1,680	976	2,140	1,790	2,780	3,100	1,550	324	357
21-----	318	1,370	2,470	1,640	1,020	1,740	1,500	2,310	4,970	1,400	356	514
22-----	432	992	2,230	1,400	1,130	1,770	1,480	2,010	4,040	1,830	368	438
23-----	471	1,090	1,820	1,420	906	1,650	1,520	2,020	3,230	1,590	928	69
24-----	434	1,200	1,950	1,410	111	1,780	1,720	1,770	2,790	1,540	1,090	323
25-----	750	1,590	1,790	1,400	452	1,870	1,730	1,620	2,640	1,650	1,020	11
26-----	767	1,360	1,500	1,590	9,200	1,670	1,740	1,620	2,570	1,600	998	122
27-----	906	1,070	1,610	1,530	9,590	1,480	1,900	1,450	2,580	1,570	1,200	194
28-----	1,690	680	1,290	816	6,230	1,970	1,770	1,600	2,790	1,630	1,480	748
29-----	1,170	92	1,380	369	4,320	1,650	1,690	1,780	2,990	1,550	737	1,050
30-----	1,170	642	1,380	363	-----	1,700	1,470	1,940	2,590	1,540	266	1,020
31-----	891	-----	1,650	526	-----	1,610	-----	2,080	-----	668	320	-----

*Discharge of Elwha River at McDonald Bridge, near Port Angeles, Wash., 1931-32—*  
Continued

Month	Observed				Gain or loss in storage in Glines Canyon Reser- voir (acre- feet)	Corrected for storage			
	Discharge in second- feet			Run-off in acre- feet		Run-off in acre- feet	Discharge in second-feet		Run-off in inches
	Maxi- mum	Mini- mum	Mean				Mean	Per square mile	
October.....	1,690	116	608	37,400	+1,190	38,600	628	2.40	2.77
November.....	5,530	92	1,580	94,000	+410	94,400	1,590	6.07	6.77
December.....	4,950	68	1,470	90,400	-1,140	89,300	1,450	5.53	6.38
January.....	3,810	330	1,350	83,000	+580	83,600	1,360	5.19	5.98
February.....	9,590	90	1,720	98,900	+410	99,300	1,730	6.60	7.12
March.....	3,580	1,390	1,980	122,000	+190	122,000	1,980	7.56	8.72
April.....	2,220	1,440	1,760	105,000	-1,580	103,000	1,730	6.60	7.36
May.....	2,780	1,230	2,040	125,000	+1,560	127,000	2,070	7.90	9.11
June.....	4,970	1,560	2,840	169,000	-150	169,000	2,840	10.8	12.05
July.....	2,700	668	1,710	105,000	-3,790	101,000	1,640	6.26	7.22
August.....	1,600	116	828	50,900	+310	51,200	833	3.18	3.67
September.....	1,090	11	495	29,500	+330	29,800	501	1.91	2.13
The year.....	9,590	11	1,530	1,110,000	-1,680	1,110,000	1,530	5.84	79.28

## PUGET SOUND BASINS

## DOSEWALLIPS RIVER BASIN

## DOSEWALLIPS RIVER NEAR BRINNON, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 24, T. 26 N., R. 3 W., half a mile above Corrigenda ranger station and 5½ miles northwest of Brinnon.

DRAINAGE AREA.—109 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 4,790 second-feet Feb. 26 (gage height, 6.74 feet); minimum, 104 second-feet Oct. 19, 21 (gage height, 1.89 feet).

1930-32: Maximum discharge, 4,790 second-feet (revised) Jan. 23, 1931, Feb. 26, 1932 (gage height, 6.7 feet); minimum, 88 second-feet Oct. 16, 1930 (gage height, 1.77 feet).

REMARKS.—Records excellent. Discharge estimated Jan. 5-15, Aug. 7, 25-31. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	172	590	185	285	185	910	504	728	752	833	326	186
2.....	150	468	268	268	185	722	545	686	722	777	341	175
3.....	130	320	302	250	185	606	540	650	740	847	349	170
4.....	235	285	268	250	185	570	590	698	854	698	368	186
5.....	225	376	232		185	644	536	758	644	600	387	195
6.....	160	1,030	250		172	575	483	758	585	565	364	200
7.....	140	782	302	340	172	514	454	812	644	560	340	192
8.....	130	490	268		172	471	426	784	728	565	315	189
9.....	130	400	232		172	442	410	861	868	540	308	168
10.....	120	340	232		172	418	414	990	1,120	784	297	165
11.....	116	302	215		160	398	471	826	1,250	612	283	165
12.....	112	320	200		160	387	575	784	1,390	540	272	160
13.....	111	982	200	630	160	383	606	770	1,490	536	269	160
14.....	110	610	185		150	434	622	716	1,490	500	252	158
15.....	108	468	172		150	430	570	650	1,300	532	272	150
16.....	108	400	185	340	150	418	585	634	1,016	570	290	152
17.....	110	360	545	320	140	485	570	698	882	487	280	148
18.....	108	302	880	563	140	686	536	770	840	442	259	134
19.....	106	380	1,690	535	140	770	565	966	770	434	262	157
20.....	111	320	1,030	445	140	634	504	1,100	1,200	450	255	152
21.....	114	285	690	400	150	540	462	826	1,760	471	242	130
22.....	150	268	560	360	150	504	438	704	1,300	487	242	125
23.....	150	280	512	320	150	479	414	650	1,020	471	240	123
24.....	172	250	610	302	356	518	406	600	882	462	255	136
25.....	215	250	490	285	898	496	402	565	840	483	246	134
26.....	200	232	490	265	3,900	454	462	527	812	434	238	118
27.....	215	215	560	250	3,960	430	570	514	833	418	229	125
28.....	332	200	445	232	2,080	475	639	532	910	414	220	128
29.....	360	200	360	232	1,250	446	644	644	942	375	212	127
30.....	320	185	340	215		426	686	728	847	349	203	127
31.....	400		320	200		442		758		337	195	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	400	106	172	1.58	1.82	10,600
November.....	1,030	185	395	3.62	4.04	23,500
December.....	1,690	172	426	3.91	4.51	26,200
January.....		200	371	3.40	3.92	22,800
February.....	3,960	140	558	5.12	5.52	32,100
March.....	910	383	520	4.77	5.50	32,000
April.....	686	402	521	4.78	5.33	31,000
May.....	1,100	514	732	6.72	7.75	45,000
June.....	1,760	585	981	9.00	10.04	58,400
July.....	847	337	535	4.91	5.66	32,900
August.....	387	195	278	2.55	2.94	17,100
September.....	200	118	154	1.41	1.57	9,160
The year.....	3,960	106	469	4.30	58.60	341,000

## SKOKOMISH RIVER BASIN

NORTH FORK OF SKOKOMISH RIVER BELOW STAIRCASE RAPIDS, NEAR HOODSPORT, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 3, T. 23 N., R. 5 W., 2 miles above Dry Creek and 10½ miles northwest of Hoodport.

DRAINAGE AREA.—60 square miles.

RECORDS AVAILABLE.—July 1924 to September 1932.

EXTREMES.—Maximum discharge during year, 5,950 second-feet Dec. 19 (gage height, 7.38 feet); minimum, 50 second-feet Nov. 4.

1924-32: Maximum discharge, 8,830 second-feet Jan. 22, 1931 (gage height, 8.67 feet); minimum, 16 second-feet Sept. 23, 1930 (gage height, 1.12 feet).

REMARKS.—Records good. Discharge estimated Nov. 6-30. No diversions or regulation.

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	216	349	234	306	204	794	857	857	674	662	231	116
2	154	142	429	280	202	633	885	815	650	627	231	110
3	123	68	429	264	202	523	801	773	745	704	234	108
4	315	54	364	264	187	548	787	794	724	560	240	106
5	297	69	323	290	176	1,110	710	808	592	479	246	110
6	193	850	316	310	170	822	598	836	543	451	237	110
7	154		400	290	168	627	549	864	376	447	223	104
8	130		361	303	165	518	503	808	644	442	215	101
9	112	800	316	455	176	456	479	871	787	425	246	95
10	101		283	414	176	425	479	899	1,050	662	234	91
11	93		252	1,490	162	408	543	773	1,150	528	223	90
12	87	500	243	870	154	384	692	759	1,280	442	196	86
13	82		228	545	144	404	759	766	1,320	413	183	82
14	76		207	448	137	533	829	692	1,320	400	173	81
15	72	350	199	389	135	528	692	621	1,110	555	176	81
16	69		199	350	128	479	773	604	843	560	178	79
17	71		725	333	123	907	787	686	731	429	169	77
18	66	500	1,820	953	121	1,150	759	766	698	376	160	72
19	63		3,930	680	119	1,050	871	1,120	644	353	177	113
20	60		1,390	495	126	780	710	1,260	854	353	171	95
21	95	350	804	436	182	621	592	878	1,190	364	171	75
22	334		615	382	210	565	528	731	990	360	166	70
23	407		526	347	199	554	483	717	822	332	155	67
24	500	300	610	320	559	859	479	644	717	325	153	65
25	388		504	306	1,760	801	498	587	710	325	151	65
26	249		471	290	4,310	627	633	543	710	291	149	63
27	328	300	491	271	3,180	552	815	538	738	288	142	62
28	536		418	252	1,760	878	829	576	780	288	136	62
29	418		368	243	1,070	686	759	704	766	294	126	62
30	337	306	347	228	-----	621	794	766	692	260	118	60
31	306		327	216	-----	656	-----	704	-----	240	116	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	536	60	207	3.45	3.98	12,700
November	-----	54	489	8.15	9.09	29,100
December	3,930	199	585	9.75	11.24	36,000
January	1,490	216	420	7.00	8.07	25,800
February	4,310	119	566	9.43	10.17	32,600
March	1,150	384	661	11.0	12.68	40,600
April	885	479	682	11.4	12.72	40,600
May	1,280	538	766	12.8	14.76	47,100
June	1,320	543	835	13.9	15.51	49,700
July	704	240	427	7.12	8.21	26,300
August	246	116	185	3.08	3.55	11,400
September	116	60	85.3	1.42	1.58	5,080
The year	4,310	54	492	8.20	111.56	357,000

## NISQUALLY RIVER BASIN

## NISQUALLY RIVER NEAR ALDER, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 23, T. 15 N., R. 4 E., 2½ miles southeast of Alder.

DRAINAGE AREA.—250 square miles.

RECORDS AVAILABLE.—August 1931 to September 1932.

EXTREMES.—Maximum discharge during period of record, 14,600 second-feet Feb. 26 (gage height, 9.75 feet); minimum, 278 second-feet Sept. 22, 1932 (gage height, 1.78 feet).

REMARKS.—Records good August and September 1931; excellent since October. Discharge estimated Aug. 30, Sept. 6, 7, 13, 20, 27, Nov. 17–20, 1931, Mar. 1–5, Sept. 6–10, 1932. No diversions or regulation.

*Discharge, in second-feet, 1931–32*

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1931			1931			1931		
1.....		491	11.....		309	21.....		333
2.....		575	12.....		410	22.....		305
3.....		555	13.....		*450	23.....		374
4.....		590	14.....		419	24.....	446	357
5.....		525	15.....		365	25.....	437	361
6.....		*500	16.....		365	26.....	500	349
7.....		*400	17.....		353	27.....	401	*357
8.....		365	18.....		446	28.....	478	365
9.....		333	19.....		365	29.....	468	293
10.....		329	20.....		*349	30.....	*459	383
						31.....	450	

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1.....	365	1,200	615	953	675	*2,600	2,440	1,850	1,600	1,550	706	396
2.....	349	1,200	660	862	670		2,440	2,130	1,550	1,500	780	365
3.....	285	925	675	814	640		2,510	1,960	1,550	1,840	772	392
4.....	432	841	645	808	625		2,130	1,800	1,500	1,660	808	460
5.....	698	790	630	808	600		2,070	1,750	1,370	1,160	841	550
6.....	500	821	610	876	590	4,290	1,800	1,650	1,200	984	814	*520
7.....	424	2,020	918	827	600	2,790	1,650	1,700	1,080	984	820	
8.....	388	1,800	876	814	660	2,130	1,500	1,650	1,040	1,020	772	
9.....	383	1,960	766	1,200	700	1,750	1,370	1,750	1,240	1,030	625	
10.....	396	1,750	736	1,200	718	1,500	1,320	2,130	1,850	1,460	555	
11.....	396	1,370	685	3,680	645	1,320	1,420	2,020	2,130	1,160	545	460
12.....	396	1,160	635	3,500	610	1,160	1,600	1,960	2,380	946	525	419
13.....	378	1,680	625	2,180	580	1,120	1,800	2,070	2,440	1,160	496	464
14.....	401	1,850	595	1,640	540	1,240	2,310	2,020	2,310	1,240	520	545
15.....	432	1,600	580	1,360	530	1,280	2,190	1,700	2,190	1,080	600	575
16.....	432	1,370	610	1,150	500	1,200	2,130	1,500	1,650	1,000	730	555
17.....	406	*1,350	2,810	1,070	491	2,210	2,380	1,550	1,320	960	736	525
18.....	374	*1,330	5,550	3,410	491	3,580	2,940	1,700	1,280	834	695	410
19.....	419	*1,320	4,200	3,010	491	4,200	3,580	1,800	1,200	766	630	376
20.....	442	*1,300	3,580	2,260	593	3,240	3,010	2,020	1,280	784	550	464
21.....	357	1,280	2,720	1,800	984	2,510	2,310	1,850	1,650	904	520	329
22.....	630	1,120	2,070	1,500	876	2,070	1,960	1,700	1,900	1,020	505	305
23.....	890	976	1,800	1,280	766	1,960	1,650	1,600	1,750	1,010	510	317
24.....	904	897	1,750	1,200	1,120	3,100	1,600	1,500	1,550	925	610	370
25.....	1,080	890	1,550	1,080	2,320	3,320	1,500	1,370	1,460	953	660	365
26.....	1,040	808	1,370	1,000	11,500	2,580	1,500	1,240	1,420	834	635	370
27.....	1,120	730	1,280	939	8,710	2,130	1,650	1,120	1,500	841	620	424
28.....	2,860	685	1,200	848	5,550	2,860	1,550	1,120	1,500	876	630	455
29.....	2,940	655	1,040	808	3,660	2,860	1,650	1,320	1,600	766	496	464
30.....	1,900	630	976	772		2,580	1,600	1,550	1,550	661	460	468
31.....	1,420		1,000	736		2,440		1,650		635	401	

\* Estimated.

Discharge, in second-feet, of Nisqually River near Alder, Wash., 1931-32—Contd.

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1931						
August 24-31 .....	500	401	455	1.82	0.54	7,220
September .....	590	293	399	1.60	1.78	23,700
The period .....						30,900
1931-32						
October .....	2,940	285	756	3.02	3.48	46,500
November .....	2,020	630	1,210	4.84	5.40	72,000
December .....	5,550	580	1,410	5.64	6.50	86,700
January .....	3,680	736	1,430	5.72	6.60	87,900
February .....	11,500	491	1,640	6.56	7.08	94,300
March .....	4,290	1,120	2,400	9.60	11.07	148,000
April .....	3,580	1,320	1,980	7.92	8.84	118,000
May .....	2,130	1,120	1,700	6.80	7.84	105,000
June .....	2,440	1,040	1,600	6.40	7.14	95,200
July .....	1,840	635	1,050	4.20	4.84	64,600
August .....	841	401	631	2.52	2.90	38,800
September .....		305	447	1.79	2.00	26,600
The year .....	11,500	285	1,350	5.40	73.69	984,000



## LITTLE NISQUALLY RIVER NEAR ALDER, WASH.

LOCATION.—Water-stage recorder in NW¼ sec. 16, T. 15 N., R. 4 E., 1,500 feet above mouth, 3,000 feet from diversion dam of Tacoma's municipal power plant, and 1½ miles southwest of Alder.

DRAINAGE AREA.—28.5 square miles.

RECORDS AVAILABLE.—August 1920 to September 1932.

EXTREMES.—Maximum discharge during year, 2,310 second-feet Feb. 26 (gage height, 6.6 feet); minimum, 5.9 second-feet Oct. 4.

1920-32: Maximum discharge, that of Feb. 26, 1932; minimum, 0.9 second-foot July 17, 1926 (gage height, 0.58 foot).

REMARKS.—Records good. Discharge estimated Nov. 2-6 and, because of ice, Feb. 1-3. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.4	90	49	137		298	282	169	71	23	14	8.3
2	6.9		51	120	55	235	276	195	68	23	13	8.3
3	6.4		58	108		182	255	162	68	38	13	7.5
4	7.4	75	56	99	57	169	217	135	66	36	14	7.5
5	18		53	105	50	761	198	120	60	30	13	7.5
6	13		53	126	49	740	169	112	54	25	13	7.5
7	12	182	186	120	51	418	156	114	50	23	12	7.5
8	9.8	175	158	118	58	282	152	114	56	22	13	7.5
9	10	293	118	247	65	206	142	112	56	21	15	7.5
10	9.8	221	95	226	66	166	140	131	71	45	16	7.5
11	9.3	153	78	940	56	133	154	116	80	48	16	7.5
12	9.3	120	70	642	50	114	190	108	83	38	16	7.5
13	8.8	302	62	342	48	110	203	112	80	36	15	7.0
14	8.8	338	55	232	43	206	249	104	74	45	14	7.0
15	8.8	229	51	170	42	226	215	89	65	48	14	7.0
16	8.8	172	64	139	39	206	201	78	53	47	13	6.6
17	8.8	180	880	146	38	543	291	80	45	43	12	6.6
18	8.8	172	1,270	887	36	712	404	92	43	37	12	6.2
19	8.8	320	900	640	36	590	690	106	44	34	12	7.0
20	9.3	290	680	398	52	407	490	118	44	32	13	14
21	12	196	450	274	160	294	319	110	46	28	15	9.1
22	108	144	312	204	135	232	240	92	46	25	15	8.3
23	196	112	253	162	108	235	192	87	42	24	13	7.5
24	201	92	299	137	234	696	174	80	36	23	12	7.5
25	296	85	268	120	708	630	164	72	34	22	12	7.5
26	232	72	226	106	1,950	418	156	68	31	20	12	7.5
27	283	62	215	94	1,100	313	172	62	28	18	11	6.6
28	398	57	182	82	690	498	166	62	27	17	9.1	6.6
29	271	53	146	76	421	436	144	67	26	16	7.5	6.6
30	170	51	131	70		339	137	76	24	14	7.5	6.6
31	116		137	64		294		76		13	8.3	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	398	6.4	80.1	2.81	3.24	4,930
November	338	51	151	5.30	5.91	8,980
December	1,270	49	245	8.60	9.92	15,100
January	940	64	236	8.28	9.55	14,500
February	1,950	36	224	7.86	8.48	12,960
March	761	110	358	12.6	14.53	22,000
April	690	137	281	8.11	9.06	13,700
May	195	62	104	3.65	4.21	6,400
June	83	24	52.4	1.84	2.05	3,120
July	48	13	29.5	1.04	1.20	1,810
August	16	7.5	12.8	1.449	.52	787
September	14	6.2	7.56	.265	.30	450
The year	1,950	6.2	144	5.05	68.96	105,000

## OHOP CREEK NEAR EATONVILLE, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 10, T. 16 N., R. 4 E., 400 feet below mouth of Lynch Creek, 600 feet below outlet of Ohop Lake, and 1½ miles northwest of Eatonville. Zero of gage is 521.58 feet above mean sea level.

RECORDS AVAILABLE.—June 1927 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 732 second-feet Mar. 5 (gage height, 3.52 feet); minimum, 4.3 second-feet Aug. 28–30 (gage height, 0.57 foot).

1927–32: Maximum discharge, that of Mar. 5, 1932; minimum, 4.0 second-feet Aug. 28, 1930.

REMARKS.—Records good except those for June 26 to July 14, Sept. 22–30, which were estimated. Natural regulation in Ohop Lake. No diversions.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	10	69	33	51	34	208	170	64	19		8 4	12
2.....	9.4	63	33	47	33	189	161	95	22		8 0	15
3.....	8.9	51	33	44	33	156	170	76	20		7.2	13
4.....	19	44	32	42	32	151	146	62	18		6 0	11
5.....	40	38	31	41	32	466	126	55	18		5 2	11
6.....	25	34	31	45	31	586	106	48	16		5 2	12
7.....	18	102	47	41	37	372	106	42	16	25	4 9	12
8.....	16	89	55	41	45	256	104	38	16		4 6	12
9.....	15	103	50	102	53	194	98	35	15		4 9	11
10.....	14	123	47	98	65	159	85	33	15		5 2	10
11.....	13	98	44	199	63	130	76	30	14		6.0	7.2
12.....	13	81	40	225	63	111	70	28	14		6.8	8.8
13.....	12	79	37	170	62	96	65	26	13		6.4	10
14.....	12	78	33	133	55	98	67	25	12		7.6	10
15.....	12	72	31	104	51	102	60	22	11	31	7.6	9.6
16.....	12	70	32	87	44	98	72	22	10	27	7.6	9.2
17.....	12	96	96	76	41	143	85	21	10	23	7.6	8.8
18.....	12	136	94	123	40	184	87	21	11	21	5.2	8.4
19.....	12	114	89	133	38	216	120	21	12	19	4 6	8.8
20.....	12	106	85	138	56	200	152	22	11	19	4 9	16
21.....	12	87	85	116	175	159	128	23	10	18	6.0	12
22.....	64	72	79	98	175	133	107	21	9.2	16	8 4	
23.....	108	62	70	83	156	116	91	22	8.4	15	6 8	
24.....	130	55	79	74	186	133	93	20	7.2	15	5 2	
25.....	90	60	81	67	248	181	98	19	7.2	14	4 6	
26.....	121	60	74	62	426	173	82	20		12	4 6	7
27.....	100	50	72	56	380	150	70	19		10	4 6	
28.....	221	44	67	51	316	184	61	18		9.2	4 3	
29.....	172	40	60	47	250	184	53	18		8.4	4 3	
30.....	118	34	55	44		192	48	18		8.0	4 3	
31.....	87		55	40		186		19		7.6	4 6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	221	8.9	49.0	3,010
November.....	136	34	73.7	4,390
December.....	96	31	56.5	3,470
January.....	225	40	86.4	5,310
February.....	426	31	111	6,380
March.....	586	96	191	11,700
April.....	170	48	98.6	5,870
May.....	95	18	32.4	1,990
June.....	22		12.2	726
July.....			20.1	1,240
August.....	8.4	4.3	5.86	360
September.....	16		9.69	577
The year.....	586	4.3	62.0	45,000

## PUYALLUP RIVER BASIN

## PUYALLUP RIVER NEAR ORTING, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 17, T. 18 N., R. 5 E., 4 miles south of Orting.

DRAINAGE AREA.—154 square miles.

RECORDS AVAILABLE.—September 1931 to September 1932.

EXTREMES.—Maximum discharge during period of records, 6,950 second-feet Feb. 26 (gage height, 8.98 feet); minimum, 125 second-feet Oct. 3.

REMARKS.—Records fair September to November 1931 and good thereafter, except those for Sept. 1-20, 27, Oct. 4, 11, 18, 25, Nov. 1, 8, 1931, which were estimated. Water diverted for Electron plant of Puget Sound Power & Light Co. returned to river above gage. Slight regulation owing to pondage in connection with Electron power plant.

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

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		195	773	304	346	394	1,430	1,360	803	865	1,060	503	316
2.....		200	746	376	322	400	1,290	1,330	918	884	965	572	290
3.....		176	565	364	305	386	1,020	1,230	841	876	1,400	596	288
4.....		328	512	333	332	372	1,040	1,060	737	809	1,180	697	322
5.....		480	489	325	334	370	3,220	967	730	739	796	735	465
6.....		256	448	306	364	370	2,510	834	706	633	636	678	532
7.....		214	1,100	391	335	416	1,720	790	712	566	637	681	501
8.....		204	935	378	344	441	1,340	745	680	547	652	652	505
9.....		202	770	337	706	476	1,090	674	753	673	668	441	370
10.....		184	698	335	661	500	936	618	913	982	1,160	398	433
11.....	340	183	612	311	2,060	481	812	676	830	1,210	770	389	432
12.....		182	538	292	1,670	457	724	724	840	1,390	592	363	373
13.....		164	780	291	1,190	433	686	780	866	1,470	736	347	364
14.....		198	786	274	970	402	801	996	820	1,440	949	394	495
15.....		180	672	268	828	379	828	874	685	1,370	804	474	493
16.....		220	598	300	750	366	758	881	650	1,000	820	592	486
17.....		177	639	1,090	697	337	1,190	925	670	837	670	594	428
18.....		176	640	1,400	1,130	339	1,800	1,020	772	803	605	538	282
19.....		174	702	1,120	1,020	340	1,860	1,250	838	754	530	444	301
20.....		191	680	987	894	482	1,480	1,090	1,020	834	560	414	398
21.....	301	166	558	802	790	856	1,140	906	856	1,180	689	392	241
22.....	206	580	478	668	724	750	981	799	774	1,260	786	391	226
23.....	191	580	444	584	648	652	896	695	723	1,140	694	428	239
24.....	187	494	404	576	603	786	1,220	658	640	963	678	542	292
25.....	232	554	424	511	576	1,310	1,270	624	568	895	676	606	288
26.....	269	615	386	468	545	5,160	1,060	626	522	893	640	586	263
27.....	242	575	348	432	520	3,680	932	666	476	956	643	571	288
28.....	214	3,030	323	400	488	2,700	1,420	673	468	982	671	523	308
29.....	168	1,810	309	361	470	1,870	1,430	632	516	1,020	519	410	321
30.....	289	1,100	298	354	458	-----	1,320	637	811	996	431	358	309
31.....	-----	800	-----	362	440	-----	1,320	-----	864	-----	424	310	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
1931						
September.....	-----	-----	168	303	1.97	2.20
1931-32						
October.....	3,030	164	471	3.06	3.53	29,000
November.....	1,100	298	588	3.82	4.26	35,000
December.....	1,400	268	494	3.21	3.70	30,400
January.....	2,060	305	696	4.52	5.21	42,800
February.....	5,160	337	893	5.80	6.26	51,400
March.....	3,220	686	1,270	8.25	9.51	78,100
April.....	1,360	618	858	5.57	6.21	51,100
May.....	1,020	468	743	4.82	5.56	45,700
June.....	1,470	547	965	6.27	7.00	57,400
July.....	1,400	424	745	4.84	5.58	45,800
August.....	735	310	504	3.27	3.77	31,000
September.....	532	226	362	2.35	2.62	21,500
The year.....	5,160	164	715	4.64	63.21	519,000

PUYALLUP RIVER AT PUYALLUP, WASH.

LOCATION.—Water-stage recorder in NE¼ sec. 20, T. 20 N., R. 4 E., 1 mile northwest of Puyallup.

DRAINAGE AREA.—914 square miles.

RECORDS AVAILABLE.—May 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 33,000 second-feet Feb. 23 (gage height, 16.0 feet); minimum not determined.

1914-32: Maximum discharge, 40,500 second-feet Dec. 18, 1917 (gage height, 34.15 feet on gage 1¼ miles upstream and at different datum); minimum probably below 350 second-feet Nov. 24, 28, Dec. 1, 3-5, 1929 (result of regulation).

REMARKS.—Records good except those for June 17 to July 17, which were estimated. All diversions returned to river above gage. Large part of flow of White River, a tributary, regulated by Lake Tapps Reservoir. Some pondage on upper Puyallup and other tributaries.

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,040	2,360	2,480	2,180	1,960	8,720	6,870	4,400	4,720	4,600	2,020	1,900
2.....	1,240	3,080	2,300	3,020	2,020	7,790	6,870	5,230	4,720		2,200	1,850
3.....	877	2,780	2,180	2,120	1,960	5,600	6,430	5,050	4,720		2,300	1,740
4.....	704	2,720	2,240	2,420	1,960	4,720	5,800	4,720	4,720		2,300	1,160
5.....	1,630	2,600	2,020	2,480	2,020	11,000	5,410	4,400	5,050		2,360	1,480
6.....	1,330	2,600	1,530	2,420	2,020	14,200	4,880	4,250	4,720	3,700	2,200	2,120
7.....	1,040	3,950	2,120	2,300	1,630	8,020	4,560	4,400	4,100		1,960	2,180
8.....	975	3,200	2,300	2,240	2,020	6,650	4,250	4,250	3,670		2,360	2,300
9.....	940	3,600	2,180	2,960	2,180	5,600	3,740	4,560	3,460		2,360	2,070
10.....	905	3,600	2,070	2,600	2,540	4,400	3,460	5,410	4,560		2,120	1,900
11.....	717	3,020	2,020	8,520	2,240	3,950	3,460	5,230	6,430	2,960	2,180	1,630
12.....	940	2,900	1,900	11,900	2,240	3,400	3,670	4,880	7,100		2,070	1,960
13.....	975	3,340	1,240	5,800	2,120	3,020	3,950	5,050	8,020		1,960	2,020
14.....	849	3,530	1,850	3,740	1,630	3,670	4,880	4,880	6,870		1,680	2,020
15.....	814	2,900	1,740	3,270	2,070	3,950	4,880	4,250	6,870		2,120	2,070
16.....	758	3,140	1,740	3,080	2,120	3,740	4,720	4,250	6,000	2,660	2,300	2,020
17.....	758	3,140	5,180	2,720	2,180	5,230	4,720	4,100			2,180	1,850
18.....	710	3,270	9,680	4,400	2,180	8,960	5,050	4,400			2,120	1,280
19.....	779	3,340	6,000	4,400	2,180	12,200	5,600	4,400			2,660	1,800
20.....	800	3,340	4,560	3,950	2,180	8,480	5,410	4,880			2,660	1,960
21.....	814	2,960	4,100	3,400	2,900	6,430	4,880	4,720	5,500	3,460	2,180	1,900
22.....	1,080	2,420	3,670	3,080	2,780	5,230	4,560	4,560			2,600	1,960
23.....	1,480	2,660	3,340	2,780	2,900	5,050	4,100	4,400			2,600	2,070
24.....	1,680	2,720	3,020	2,600	2,960	6,000	3,950	4,100			3,340	2,120
25.....	1,580	2,780	2,240	2,840	3,530	6,650	3,810	3,810			3,600	2,200
26.....	2,240	2,180	2,360	2,720	20,700	5,600	3,740	3,530	5,200	2,440	2,180	1,900
27.....	2,070	2,480	1,960	2,540	24,500	5,230	3,950	3,200			2,540	1,960
28.....	7,300	2,480	2,660	2,480	17,100	6,000	3,950	3,020			2,480	1,740
29.....	10,600	2,020	2,600	2,420	11,400	6,650	3,810	3,080			2,240	1,850
30.....	4,720	2,240	2,660	2,070	-----	6,430	4,100	3,950			2,120	2,020
31.....	2,900	-----	2,600	1,740	-----	6,870	-----	5,230	-----	1,850	2,020	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	10,600	704	1,780	-----	-----	109,000
November.....	3,950	2,020	2,910	-----	-----	173,000
December.....	9,680	1,240	2,860	-----	-----	176,000
January.....	11,900	1,740	3,390	-----	-----	208,000
February.....	24,500	1,630	4,490	-----	-----	258,000
March.....	14,200	3,020	6,430	-----	-----	395,000
April.....	6,870	3,460	4,650	-----	-----	277,000
May.....	5,410	3,020	4,410	-----	-----	271,000
June.....	8,020	3,460	5,350	-----	-----	318,000
July.....	-----	1,850	3,480	-----	-----	214,000
August.....	2,360	1,380	2,080	-----	-----	128,000
September.....	2,300	1,160	1,840	-----	-----	109,000
The period.....	24,500	704	3,630	3.97	54.04	2,640,000

NOTE.—Monthly discharge in second-feet per square mile and run-off in inches not computed, owing to regulation. Yearly figures closely represent natural flow.

## KAPOWSIN CREEK NEAR KAPOWSIN, WASH

LOCATION.—Water-stage recorder in NE¼ sec. 5, T. 17 N., R. 5 E., half a mile below Kapowsin Lake and 1½ miles east of Kapowsin. Zero of gage is 564.2 feet above mean sea level.

RECORDS AVAILABLE.—June 1927 to October 1932 (discontinued).

EXTREMES.—Maximum discharge during period Oct. 1, 1931, to Oct. 7, 1932, 393 second-feet Mar. 6 (gage height, 3.78 feet); minimum, 2.4 second-feet Oct. 7, 1932 (gage height, 0.91 foot).

1927-32: Maximum discharge, that of Mar. 6, 1932; minimum, 1.4 second-feet Sept. 2, 1930 (gage height, 0.84 foot).

REMARKS.—Records good except those for Nov. 12-22, July 9-13, which were estimated. Flow subject to natural regulation in Kapowsin Lake.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	8.2	62	42	54	46	226	153	59	24	6.0	6.6	5.0	3.5
2	8.6	57	40	50	43	194	148	66	24	5.4	6.6	5.1	3.5
3	8.9	54	38	48	40	170	146	69	25	6.5	6.3	5.1	3.2
4	9.6	50	37	45	39	150	141	69	24	6.5	5.8	5.1	3.1
5	11	47	36	44	38	212	128	65	21	6.6	5.3	5.1	2.8
6	12	44	34	43	37	374	118	61	21	6.5	4.8	5.0	2.7
7	11	47	34	41	39	346	113	58	20	6.5	4.6	4.6	2.4
8	10	54	37	41	41	271	108	54	19	6.3	4.6	4.4	-----
9	10	59	39	48	46	215	101	50	18	-----	4.8	4.4	-----
10	10	69	41	57	55	185	94	47	17	-----	5.4	4.4	-----
11	10	72	40	85	58	152	87	45	16	8	5.6	4.4	-----
12	9.6	39	145	58	132	83	42	15	-----	-----	5.6	4.2	-----
13	9.2	37	150	58	113	77	40	13	-----	-----	5.6	4.0	-----
14	8.9	35	130	55	104	73	37	12	-----	9.4	5.6	3.9	-----
15	8.9	33	112	53	98	71	35	12	-----	11	5.6	3.6	-----
16	8.6	33	98	49	94	69	33	10	-----	12	5.6	3.5	-----
17	8.9	48	88	46	106	73	31	10	-----	12	5.6	3.2	-----
18	8.2	75	95	44	125	74	30	10	-----	11	5.6	2.7	-----
19	7.8	89	106	42	143	82	30	10	-----	10	5.6	2.7	-----
20	7.5	92	108	46	145	94	29	10	-----	10	5.6	3.2	-----
21	7.2	91	104	79	133	104	30	10	-----	9.4	5.6	3.0	-----
22	10	87	94	118	120	99	30	9.8	-----	9.1	5.6	3.0	-----
23	16	80	84	122	114	93	29	9.1	-----	9.4	5.6	3.0	-----
24	26	64	75	77	125	122	90	28	-----	8.6	9.1	5.6	3.0
25	34	60	73	72	148	148	87	27	-----	8.1	8.9	5.4	3.2
26	41	58	71	67	272	157	81	27	-----	7.6	8.4	5.4	3.1
27	45	55	67	64	355	150	76	25	-----	7.3	8.1	5.3	3.0
28	50	52	65	58	317	155	68	25	-----	6.8	7.8	5.1	3.0
29	65	48	60	54	271	170	63	24	-----	6.5	7.6	5.0	3.0
30	70	45	56	52	-----	170	59	24	-----	6.1	7.1	4.6	3.1
31	67	-----	55	49	-----	160	-----	25	-----	-----	6.8	4.8	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October	70	7.2	19.9	1,220
November	-----	44	61.2	3,640
December	92	33	54.2	3,330
January	150	41	76.2	4,690
February	355	37	94.5	5,440
March	374	94	166	10,200
April	153	59	95.1	5,660
May	69	24	40.1	2,470
June	25	6.1	13.7	815
July	12	5.4	8.30	510
August	6.6	4.6	5.45	335
September	5.1	2.7	3.80	228
The year	374	2.7	53.1	38,500
1932				
October 1-7	3.5	2.4	3.03	42.1

## CARBON RIVER NEAR FAIRFAX, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 22, T. 18 N., R. 6 E., 1¼ miles northwest of Fairfax.

DRAINAGE AREA.—82 square miles.

RECORDS AVAILABLE.—March 1929 to September 1932; November 1910 to July 1912 at station 1¼ miles upstream.

EXTREMES.—Maximum discharge during year, 4,390 second-feet Feb. 26 (gage height, 7.74 feet); minimum, 82 second-feet Sept. 19.

1910-12, 1929-32: Maximum discharge, that of Feb. 26, 1932; minimum, 40 second-feet (estimated) Jan. 20, 1930 (stage-discharge relation affected by ice).

REMARKS.—Records fair except those for Jan. 12-22, July 6-9, 13, which were estimated. Water diverted for use in lumber industry but returned to river above gage.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	126	578	148	176	128	721	868	600	628	673	357	156
2.....	133	589	169	159	128	611	835	633	661	769	361	145
3.....	128	452	172	153	124	500	738	578	650	970	349	128
4.....	211	388	162	190	119	567	633	520	628	685	366	139
5.....	379	361	166	197	115	1,370	567	500	540	545	388	186
6.....	258	466	156	224	117	922	490	505	481		375	243
7.....	197	805	190	197	124	661	461	525	457		375	243
8.....	150	611	172	197	122	545	429	505	495	500	344	239
9.....	136	550	156	485	139	471	392	556	697		286	159
10.....	124	481	156	442	126	429	383	685	835	697	247	180
11.....	122	401	142	1,210	117	406	415	606	900	567	235	176
12.....	115	388	128		115	375	490	600	970	400	220	128
13.....	115	661	128		106	366	556	616	900	562	212	124
14.....	110	594	119		103	429	703	572	900	679	208	166
15.....	108	495	112	630	101	442	600	505	715	594	262	183
16.....	108	424	164		97	429	562	476	606	556	311	156
17.....	108	406	1,350		94	685	540	510	572	495	303	136
18.....	106	361	1,250		94	1,300	589	578	562	419	286	96
19.....	105	461	868		96	1,250	650	594	589	401	278	179
20.....	105	429	709	330	176	900	584	638	721	410	274	280
21.....	103	349	550		247	739	505	578	805	438	247	176
22.....	183	299	442		197	638	457	540	769	476	258	136
23.....	247	258	375	258	180	589	415	589	667	461	251	115
24.....	220	239	344	235	307	727	406	490	611	433	290	119
25.....	258	247	299	224	1,070	733	392	442	611	433	319	145
26.....	262	212	266	201	3,290	633	424	392	628	392	294	145
27.....	346	180	251	186	2,020	589	490	366	638	401	270	145
28.....	2,300	162	220	169	1,330	775	495	397	697	401	274	148
29.....	1,410	153	197	159	900	757	466	520	685	349	197	148
30.....	868	148	190	150		769	500	685	673	311	194	142
31.....	661		194	139		868		638		290	153	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	2,300	103	316	3.85	4.44	19,400
November.....	805	148	405	4.94	5.51	24,100
December.....	1,350	112	321	3.91	4.51	19,700
January.....	1,210	139	348	4.24	4.89	21,400
February.....	3,290	94	410	5.00	5.39	23,600
March.....	1,370	366	684	8.34	9.62	42,100
April.....	868	383	584	6.51	7.26	31,800
May.....	685	366	546	6.66	7.68	33,600
June.....	970	457	676	8.24	9.19	40,200
July.....	970	290	510	6.22	7.17	31,400
August.....	388	153	283	3.45	3.98	17,400
September.....	280	96	162	1.98	2.21	9,640
The year.....	3,290	94	433	5.28	71.85	314,000

## WHITE RIVER AT GREENWATER, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 10, T. 19 N., R. 9 E., three quarters of a mile southeast of Greenwater and above mouth of Greenwater River.

DRAINAGE AREA.—216 square miles.

RECORDS AVAILABLE.—March 1929 to September 1932; September 1911 to May 1912 fragmentary, for a station 2 miles above, published as White River near Enumclaw, Wash.

EXTREMES.—Maximum discharge during year, 7,110 second-feet Feb. 26 (gauge height, 7.73 feet); minimum, 210 second-feet Oct. 21 (gauge height 2.70 feet). 1911-12, 1929-32: Maximum discharge, that of Feb. 26, 1932; minimum, probably less than 150 second-feet sometime during January 1930.

REMARKS.—Records good except those above 3,000 second-feet, which are poor, and those for Feb. 1-6, which were estimated because of ice. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	267	475	306	414	310	1,710	1,410	1,320	1,200	1,750	755	395
2.....	261	489	320	388		1,360	1,470	1,380	1,230	1,720	785	384
3.....	242	414	306	383		1,080	1,330	1,360	1,300	1,950	765	390
4.....	265	383	299	398		1,040	1,190	1,330	1,370	1,580	826	413
5.....	328	383	296	393		2,090	1,040	1,350	1,250	1,330	816	477
6.....	264	486	292	393		1,950	921	1,350	1,110	1,230	805	527
7.....	244	1,050	302	383	324	1,430	836	1,390	1,060	1,200	805	469
8.....	233	778	296	393	320	1,060	765	1,350	1,110	1,210	725	455
9.....	233	659	288	617	320	847	725	1,430	1,360	1,210	629	395
10.....	231	561	288	577	316	735	725	1,700	1,750	1,410	568	443
11.....	228	503	276	2,300	302	648	826	1,580	2,090	1,180	513	407
12.....	231	489	267	2,080	299	577	987	1,590	2,300	1,050	491	378
13.....	226	727	270	1,550	206	552	1,170	1,680	2,450	1,370	498	395
14.....	226	727	258	1,260	288	585	1,420	1,560	2,450	1,380	527	425
15.....	226	617	267	1,040	288	620	1,260	1,380	2,380	1,320	686	425
16.....	228	553	279	894	282	593	1,190	1,300	1,950	1,250	676	419
17.....	233	517	1,130	786	279	775	1,190	1,330	1,750	1,130	676	384
18.....	226	463	1,800	876	282	1,480	1,180	1,530	1,680	1,020	629	328
19.....	226	601	1,580	813	285	2,090	1,210	1,560	1,570	965	560	340
20.....	226	601	1,430	710	292	1,680	1,110	1,710	1,680	998	513	336
21.....	216	496	1,150	617	296	1,310	987	1,580	2,020	1,040	477	304
22.....	276	432	932	538	299	1,140	900	1,420	2,160	1,090	505	300
23.....	276	393	804	510	299	1,030	816	1,270	2,020	1,030	527	304
24.....	258	362	736	489	345	1,230	785	1,140	1,880	965	638	320
25.....	279	367	650	469	581	1,320	745	1,040	1,740	910	696	312
26.....	282	341	593	444	4,990	1,100	816	943	1,680	868	705	308
27.....	313	320	553	426	4,680	965	954	878	1,740	889	638	336
28.....	1,160	306	517	409	3,630	1,050	1,010	868	1,820	826	593	336
29.....	1,030	306	475	388	2,380	1,120	1,010	987	1,820	775	455	336
30.....	650	302	457	378		1,140	1,120	1,270	1,820	705	413	336
31.....	517		438	354		1,270		1,230		705	395	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	1,160	216	326	1.51	1.74	20,000
November.....	1,050	302	503	2.33	2.60	29,900
December.....	1,800	258	576	2.67	3.08	35,400
January.....	2,300	354	699	3.24	3.74	43,070
February.....	4,990	279	811	3.75	4.04	46,600
March.....	2,090	552	1,150	5.32	6.13	70,700
April.....	1,470	725	1,040	4.81	5.37	61,900
May.....	1,710	868	1,350	6.25	7.21	83,000
June.....	2,450	1,060	1,720	7.96	8.88	102,000
July.....	1,950	705	1,160	5.37	6.19	71,300
August.....	826	395	622	2.88	3.32	38,200
September.....	527	300	379	1.75	1.95	22,600
The year.....	4,990	216	861	3.99	54.25	625,000

WHITE RIVER NEAR BUCKLEY, WASH.

LOCATION.—Water-stage recorder in SE¼NE¼ sec. 9, T. 19 N., R. 7 E., 5 miles east of Buckley.

DRAINAGE AREA.—400 square miles.

RECORDS AVAILABLE.—October 1928 to September 1932.

EXTREMES.—Maximum discharge during year, about 17,000 second-feet Feb. 26 (gage height, 17.5 feet); minimum, 284 second-feet Oct. 21 (gage height, 2.15 feet).

1928-32: Maximum discharge, that of Feb. 26, 1932; minimum, 213 second-feet Nov. 21, 1929 (gage height, 1.78 feet); discharge may have been less during period Jan. 15-30, 1930, when stage-discharge relation was affected by ice.

REMARKS.—Records excellent except those above 4,000 second-feet, which are fair, and those for Jan. 31 to Feb. 6, July 11-15, which were estimated. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	405	1,110	615	738	580	3,370	3,570	1,980	2,210	2,210	1,000	650
2	405	1,070	649	684		2,670	3,570	2,210	2,280	2,210	1,020	616
3	367	890	615	666		2,090	3,270	2,350	2,280	2,350	1,020	600
4	438	793	598	890		2,150	2,670	2,350	2,350	2,280	1,060	633
5	806	756	632	890		7,070	2,350	2,350	2,350	1,980	1,060	718
6	567	930	598	930	632	5,870	2,090	2,280	2,150	1,830	1,060	752
7	460	2,000	632	870		3,370	1,930	2,280	1,980	1,680	1,020	735
8	405	1,560	615	890		615	2,500	1,780	2,350	1,930	1,020	701
9	379	1,390	598	1,800		632	2,090	2,350	2,030	1,580	920	600
10	355	1,230	598	1,560		632	1,830	1,530	2,970	2,900	862	650
11	344	1,070	550	6,630	615	1,580	1,480	2,870	3,570	1,550	824	616
12	332	1,030	519	4,440	582	1,440	1,680	2,770	3,990		787	567
13	322	1,680	519	2,510	566	1,350	1,880	2,970	3,990		752	567
14	322	1,660	488	1,900	534	1,400	2,600	2,770	3,880		752	633
15	311	1,390	473	1,560	534	1,530	2,670	2,580	3,470		824	633
16	322	1,230	575	1,350	504	1,440	2,350	2,350	2,870	1,440	920	616
17	332	1,150	3,880	1,230	488	1,920	2,280	2,210	2,580	1,400	920	583
18	311	1,110	5,230	1,560	488	4,040	2,280	2,210	2,350	1,260	901	490
19	311	1,270	3,190	1,520	488	5,900	2,280	2,280	2,210	1,220	862	551
20	311	1,350	2,740	1,350	582	4,210	2,350	2,420	2,210	1,220	824	616
21	292	1,110	2,140	1,230	684	2,970	2,150	2,580	2,710	1,300	787	490
22	475	990	1,700	1,110	720	2,350	1,980	2,500	3,070	1,350	843	460
23	616	910	1,480	1,030	666	2,150	1,880	2,350	2,770	1,300	862	460
24	583	831	1,310	970	950	2,740	1,730	2,150	2,670	1,260	882	505
25	701	870	1,150	930	2,330	3,370	1,630	2,030	2,420	1,220	901	490
26	752	774	1,070	870	13,400	2,580	1,580	1,930	2,350	1,140	901	460
27	920	720	990	850	12,000	2,210	1,630	1,780	2,280	1,140	862	490
28	5,430	666	910	793	8,720	2,520	1,730	1,680	2,280	1,140	862	490
29	2,890	649	831	756	5,050	2,870	1,780	1,680	2,280	1,060	770	490
30	1,680	615	793	720	-----	2,970	1,830	1,980	2,280	980	684	490
31	1,270	-----	774	650	-----	3,470	-----	2,210	-----	940	633	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	5,430	292	755	1.89	2.18	46,400
November	2,000	615	1,090	2.72	3.04	64,900
December	5,230	473	1,210	3.02	3.48	74,400
January	6,630	650	1,420	3.55	4.09	87,300
February	13,400	488	1,930	4.82	5.20	111,000
March	7,070	1,350	2,840	7.10	8.19	175,000
April	3,570	1,480	2,140	5.35	5.97	127,000
May	2,970	1,680	2,320	5.80	6.69	143,000
June	3,990	1,930	2,620	6.55	7.31	156,000
July	2,350	940	1,500	3.75	4.32	92,200
August	1,060	633	884	2.21	2.55	54,400
September	752	460	578	1.44	1.61	34,400
The year	13,400	292	1,600	4.00	54.63	1,170,000



## GREENWATER RIVER AT GREENWATER, WASH.

LOCATION.—Water-stage recorder in NW¼NW¼ sec. 11, T. 19 N., R. 9 E., 1 mile above mouth and 1 mile east of Greenwater.

DRAINAGE AREA.—75 square miles.

RECORDS AVAILABLE.—September 1911 to August 1912, fragmentary; May 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 1,490 second-feet Feb. 26 (gage height, 5.33 feet); minimum, 29 second-feet Oct. 18–21 (gage height, 1.50 feet).

1911–12, 1929–32: Maximum discharge (estimated), 2,800 second-feet Nov. 19, 1911 (gage height, 5.0 feet, former datum); minimum, probably less than 25 second-feet sometime Jan. 15–25, 1930.

REMARKS.—Records good except those for Apr. 12–14, which were estimated. No diversions or regulation.

## Discharge, in second-feet, 1931–32

Month	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	34	115	75	93	93	434	607	490	516	218	74	47
2.....	33	102	72	87	90	354	607	537	520	205	74	46
3.....	32	89	69	87	87	302	537	542	520	221	70	44
4.....	39	77	68	102	86	375	464	524	516	196	68	42
5.....	57	72	67	103	84	808	400	507	481	172	65	41
6.....	49	79	65	104	83	629	354	494	443	162	63	40
7.....	42	172	65	102	83	460	322	516	413	154	62	40
8.....	39	159	64	104	83	367	291	511	392	142	60	40
9.....	36	148	61	187	82	314	276	542	409	135	62	40
10.....	35	132	62	192	82	268	272	629	473	138	64	38
11.....	34	120	59	636	80	237	310	629	533	128	67	38
12.....	32	122	57	577	77	211	480	607	585	118	65	37
13.....	31	199	56	353	72	199		607	629	116	63	37
14.....	31	221	53	262	68	196	585	607	629	118	60	36
15.....	30	185	52	214	68	193		546	629	115	60	36
16.....	30	159	57	185	67	187	524	498	546	107	58	36
17.....	30	146	237	167	67	330	481	481	473	102	57	35
18.....	29	132	367	169	67	629	447	486	421	100	56	34
19.....	29	144	308	159	67	740	447	494	388	96	54	41
20.....	29	154	301	150	73	585	417	516	358	94	54	47
21.....	29	135	259	141	83	477	379	516	354	90	53	40
22.....	40	122	214	132	82	405	350	511	363	88	54	37
23.....	52	115	185	125	84	371	318	481	346	86	53	36
24.....	49	106	165	122	117	490	302	451	334	83	52	36
25.....	50	104	146	118	528	498	287	421	314	83	50	36
26.....	59	97	133	112	1,260	405	322	384	295	80	48	35
27.....	80	89	123	109	1,060	363	379	350	276	78	46	34
28.....	516	86	115	106	808	413	388	330	262	77	45	33
29.....	317	80	108	103	563	434	379	346	248	77	47	33
30.....	189	77	102	100	-----	498	421	477	227	77	51	32
31.....	139	-----	97	96	-----	563	-----	516	-----	76	47	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	516	29	71.6	0.955	1.10	4,400
November.....	221	72	125	1.67	1.86	7,440
December.....	367	52	125	1.67	1.92	7,690
January.....	636	87	171	2.28	2.63	10,600
February.....	1,260	67	212	2.83	3.05	12,200
March.....	808	187	411	5.48	6.32	25,300
April.....	607	272	410	5.47	6.10	24,400
May.....	629	330	501	6.68	7.70	30,800
June.....	629	227	430	5.73	6.89	25,600
July.....	221	76	120	1.60	1.84	7,380
August.....	74	45	58.1	.775	.89	3,570
September.....	47	32	38.2	.509	.57	2,270
The year.....	1,260	29	222	2.96	40.37	162,000

LAKE WASHINGTON BASIN

CEDAR RIVER AT CEDAR FALLS, WASH.

LOCATION.—Water-stage recorder in sec. 4, T. 22 N., R. 8 E., three quarters of a mile below Seattle municipal power plant at Cedar Falls.

DRAINAGE AREA.—83 square miles.

RECORDS AVAILABLE.—April 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 1,740 second-feet Mar. 19 (gage height, 7.25 feet); minimum, 24 second-feet Aug. 24 (gage height, 4.31 feet).

1914-32: Maximum discharge, 6,290 second-feet Dec. 19, 1917 (gage height, 11.4 feet); no flow Nov. 25, 1917, Aug. 18, 1923.

REMARKS.—Records excellent. Discharge estimated Jan. 18. All diversions returned to river above station. Flow partly regulated in Cedar Lake Reservoir for power-plant operation. Some discharge measurements furnished by city of Seattle.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	212	329	272	318	574	1,080	436	410	302	128	283
2	79	253	335	262	326	352	1,270	465	381	282	224	246
3	70	320	309	296	315	216	1,260	501	424	288	217	222
4	78	349	339	292	288	188	1,110	524	461	278	130	200
5	80	311	323	290	308	598	1,000	475	450	303	126	210
6	90	312	444	297	286	1,330	880	458	417	306	119	162
7	83	192	372	270	277	1,260	730	487	451	287	112	136
8	87	159	339	276	297	1,040	664	473	436	330	121	126
9	98	258	274	290	330	786	585	478	374	282	119	130
10	152	162	254	332	286	739	492	510	448	252	117	137
11	145	149	224	338	285	748	443	587	434	242	119	134
12	141	122	192	304	310	650	396	597	564	194	119	127
13	126	144	108	314	238	576	428	611	692	259	118	130
14	166	155	107	291	281	297	529	583	696	183	221	132
15	172	252	85	382	324	375	656	579	746	248	164	107
16	187	173	91	314	302	413	691	560	710	162	166	100
17	161	171	124	295	260	216	781	538	620	142	122	97
18	159	168	190	320	254	374	812	531	496	160	168	85
19	187	167	158	313	180	1,230	904	494	480	161	166	125
20	183	188	194	294	135	1,430	974	526	438	162	166	98
21	194	228	228	298	111	1,330	913	534	450	231	166	91
22	202	238	235	292	103	1,120	832	559	388	160	164	94
23	210	292	261	274	121	1,080	712	525	395	230	166	102
24	214	294	245	286	166	926	635	556	356	192	155	98
25	222	276	224	290	163	1,130	530	574	340	135	151	94
26	229	252	249	312	816	1,130	462	490	360	136	112	98
27	258	257	214	302	1,110	1,120	438	470	298	212	116	94
28	286	260	238	288	888	772	442	384	302	143	141	96
29	178	290	252	311	709	866	432	400	283	136	143	103
30	220	388	264	331	-----	915	399	344	264	129	152	108
31	236	-----	249	342	-----	1,010	-----	368	-----	124	167	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	286	70	160	-----	-----	9,840
November	388	122	233	-----	-----	13,900
December	444	85	240	-----	-----	14,800
January	382	262	302	-----	-----	18,600
February	1,110	103	337	-----	-----	19,400
March	1,430	188	800	-----	-----	49,200
April	1,270	396	716	-----	-----	42,600
May	611	344	504	-----	-----	31,000
June	746	264	452	-----	-----	26,900
July	330	124	215	-----	-----	13,200
August	224	104	132	-----	-----	8,120
September	283	85	132	-----	-----	7,860
The year	1,430	70	352	4.24	57.71	255,000

NOTE.—Monthly discharge in second-feet per square mile and run-off in inches not computed, owing to regulation. Yearly figures closely represent natural flow.

## CEDAR RIVER NEAR LANDSBERG, WASH.

LOCATION.—Water-stage recorder in sec. 17, T. 22 N., R. 7 E., 1¼ miles above intake of Seattle water-supply system at Landsberg.

DRAINAGE AREA.—136 square miles.

RECORDS AVAILABLE.—April 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 4,860 second-feet Feb. 26 (gauge height, 5.9 feet); minimum not determined.

1914-32: Maximum discharge, 7,500 second-feet Dec. 29, 1917 (gauge height, 13.55 feet); minimum, 162 second-feet Oct. 15, 1914. Discharge may have been lower sometime during Oct. 15-26, 1925.

REMARKS.—Records excellent except those for Oct. 1-5, 7-12, 18, 19, Aug. 22 to Sept. 2, Sept. 9-23, which were estimated. All diversions, except Rock Creek, returned to river above station. Owing to danger of pollution, Rock Creek entering naturally just above gauge has been diverted to a point below municipal water-supply intake. This year's records corrected for amount of diversion. Flow partly controlled by storage and release of water at Cedar Lake Reservoir.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	320	492	583	650	727	1,390	1,860	930	825	608	420	610
2		516	591	628	728	1,230	2,000	959	813	594	506	550
3		557	547	662	722	955	1,940	1,000	846	610	504	510
4		574	585	701	678	945	1,750	938	886	594	426	465
5		549	566	702	700	2,280	1,630	958	889	614	417	476
6	294	558	684	750	675	2,920	1,470	942	852	616	416	443
7		480	634	716	679	2,370	1,340	938	875	592	402	412
8		406	610	712	696	1,990	1,280	940	828	625	410	400
9		541	542	935	746	1,650	1,190	942	767	581	416	
10		300	456	527	986	1,500	1,100	971	836	574	408	
11	306	416	492	1,430	679	1,440	1,060	1,030	815	570	416	380
12		396	456	1,220	712	1,310	1,000	1,030	914	492	418	
13		510	384	990	626	1,250	1,010	1,030	1,050	588	408	
14		532	376	878	662	1,000	1,090	999	1,060	501	506	
15		352	582	352	907	696	1,060	1,170	996	1,080	398	
16	356	358	480	366	830	680	1,070	1,200	968	1,060	471	320
17		339	494	560	819	624	1,050	1,300	954	979	445	401
18		340	480	829	926	611	1,350	1,380	946	860	452	400
19		360	532	692	918	568	2,140	1,520	912	838	464	400
20		356	538	690	853	528	2,320	1,560	938	796	460	414
21	465	372	530	680	838	551	2,040	1,470	943	792	520	400
22		434	548	656	794	529	1,780	1,380	980	746	460	400
23		470	569	681	764	532	1,730	1,270	960	742	517	
24		460	570	648	775	619	1,750	1,170	968	695	491	335
25		465	571	628	756	814	1,920	1,090	983	658	434	324
26	507	507	541	656	766	3,120	1,820	1,000	904	699	431	329
27		528	529	592	754	2,790	1,790	995	862	628	500	316
28		844	531	623	724	2,020	1,620	962	778	623	436	318
29		617	548	615	745	1,620	1,660	927	795	606	430	322
30		552	620	628	736	-----	1,750	894	776	582	424	319
31	525	-----	614	794	-----	1,780	-----	801	-----	422	-----	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	844	-----	394	-----	-----	24,200
November	620	396	522	-----	-----	31,100
December	829	352	583	-----	-----	35,800
January	1,430	628	828	-----	-----	50,900
February	3,120	528	898	-----	-----	51,700
March	2,920	945	1,640	-----	-----	101,000
April	2,000	894	1,300	-----	-----	77,400
May	1,030	776	940	-----	-----	57,800
June	1,080	582	821	-----	-----	48,900
July	625	422	518	-----	-----	31,900
August	-----	-----	427	-----	-----	26,300
September	610	-----	388	-----	-----	23,100
The year	3,120	-----	771	5.67	77.18	560,000

NOTE.—Monthly discharge in second-feet per square mile and run-off in inches not computed, owing to regulation. Yearly figures closely represent natural flow.

## SNOHOMISH RIVER BASIN

## SOUTH FORK OF SKYKOMISH RIVER NEAR INDEX, WASH.

LOCATION.—Staff gage in NE¼ sec. 29, T. 27 N., R. 10 E., 300 feet above Sunset Falls, 2 miles above North Fork, and 2 miles southeast of Index.

DRAINAGE AREA.—355 square miles.

RECORDS AVAILABLE.—October 1902 to September 1905; April 1911 to September 1932.

EXTREMES.—Maximum discharge during year, 49,000 second-feet Feb. 26 (gage height, 21.50 feet); stage and discharge probably somewhat higher sometime during day; minimum, 400 second-feet Oct. 18–21, Sept. 15–18.

1902–5, 1911–32: Maximum discharge, about 57,000 second-feet (revised) Dec. 18, 1917 (gage height, 22.6 feet); minimum, 214 second-feet Oct. 15–21, 23, 1925.

REMARKS.—Records good. No diversions or regulation.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	700	2,300	845	950	745	4,670	5,320	4,800	4,200	3,450	1,190	845
2	575	2,950	845	845	700	3,650	4,670	4,310	3,980	3,550	1,137	745
3	535	1,990	795	845	700	2,950	4,200	4,200	3,980	4,930	1,070	655
4	700	1,640	795	895	700	2,750	3,550	4,200	4,200	4,670	1,070	575
5	2,560	1,570	745	950	700	10,300	3,050	3,980	3,450	3,450	1,010	535
6	1,570	1,710	745	1,570	700	4,670	2,950	3,760	2,950	2,750	1,010	535
7	1,130	4,430	895	1,310	795	3,450	2,750	4,430	2,950	2,560	1,010	535
8	895	3,350	950	1,190	845	2,750	2,650	4,200	3,150	2,470	950	575
9	745	3,150	845	2,650	950	2,380	2,380	4,930	4,430	2,560	895	535
10	655	2,380	845	2,220	1,010	2,060	2,380	6,040	6,040	4,090	845	500
11	615	2,060	795	20,900	895	1,920	2,750	5,060	6,510	3,150	895	465
12	535	1,920	745	5,740	795	1,640	3,760	5,190	7,740	2,560	895	430
13	500	10,900	700	3,450	745	1,640	4,670	5,600	7,560	2,470	750	430
14	465	4,430	615	2,560	655	1,780	6,350	4,800	8,480	2,300	745	430
15	465	3,150	615	2,060	655	1,990	4,670	3,980	6,040	2,220	745	400
16	430	2,560	615	1,780	575	1,990	4,200	3,760	4,800	2,220	745	400
17	430	2,300	1,710	1,640	575	4,430	4,200	4,200	4,090	2,060	745	400
18	400	2,060	4,800	1,920	535	10,900	4,930	4,670	3,980	1,780	700	400
19	400	3,150	4,430	1,780	535	9,890	5,320	4,930	3,980	1,640	655	575
20	400	2,560	3,980	1,640	895	5,320	3,980	5,460	4,430	1,640	655	1,570
21	400	2,060	2,950	1,500	1,130	3,980	3,350	4,800	5,060	1,710	655	1,010
22	700	1,780	2,300	1,310	1,130	3,350	2,950	4,430	5,460	1,780	745	795
23	1,190	1,500	1,920	1,190	1,010	3,250	2,560	4,670	4,930	1,710	655	565
24	1,370	1,370	1,780	1,130	1,920	5,320	2,470	3,980	4,200	1,640	655	575
25	1,430	1,310	1,640	1,070	8,870	4,800	2,380	3,350	3,870	1,640	615	535
26	1,640	1,190	1,430	1,070	42,400	3,980	3,150	2,850	3,760	1,500	615	500
27	2,750	1,070	1,370	1,010	23,700	3,150	3,870	2,750	4,200	1,370	575	465
28	4,930	1,010	1,250	895	12,200	4,670	3,450	2,850	3,870	1,310	700	465
29	3,450	950	1,130	895	7,020	4,090	3,870	3,650	3,980	1,310	745	465
30	2,650	895	1,070	845	-----	3,980	3,980	4,430	3,550	1,190	745	430
31	2,300	-----	1,010	745	-----	4,200	-----	4,310	-----	1,130	700	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	4,930	400	1,210	3.41	3.93	74,400
November	10,900	895	2,460	6.93	7.73	146,000
December	4,800	615	1,460	4.11	4.74	89,800
January	20,900	745	2,210	6.23	7.18	136,000
February	42,400	535	3,930	11.1	11.97	226,000
March	10,900	1,640	4,060	11.4	13.14	250,000
April	6,350	2,380	3,690	10.4	11.60	220,000
May	6,040	2,750	4,340	12.2	14.07	267,000
June	8,480	2,950	4,660	13.1	14.62	277,000
July	4,930	1,130	2,350	6.62	7.63	144,000
August	1,190	575	812	2.29	2.64	49,900
September	1,570	400	581	1.64	1.83	34,600
The year	42,400	400	2,640	7.44	101.08	1,910,000

## SKYKOMISH RIVER NEAR GOLD BAR, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 9, T. 27 N., R. 9 E., 2 miles southeast of Gold Bar.

DRAINAGE AREA.—535 square miles.

RECORDS AVAILABLE.—September 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 74,400 second-feet Feb. 26 (gage height, 20.7 feet); minimum, 710 second-feet Oct. 20.

1928-32: Maximum discharge, that of Feb. 26, 1932; minimum, 392 second-feet Oct. 2, 3, 1929.

REMARKS.—Records excellent. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,470	4,460	1,400	1,610	1,140	7,690	8,200	7,690	6,730	6,060	2,140	1,380
2	1,120	5,580	1,410	1,480	1,090	6,280	7,690	7,200	6,500	5,650	2,070	1,350
3	985	3,660	1,370	1,420	1,050	5,060	6,960	6,960	6,280	8,780	2,000	1,140
4	1,400	2,960	1,350	1,480	1,010	4,590	6,060	6,730	6,730	9,300	2,070	1,150
5	4,590	2,660	1,320	1,680	1,030	11,600	5,850	6,500	5,850	5,850	2,070	1,010
6	3,190	4,180	1,290	2,580	1,050	8,520	5,060	6,280	5,600	4,870	2,000	1,020
7	2,210	7,900	1,520	2,280	1,200	5,850	4,500	6,960	5,060	4,590	1,940	1,010
8	1,740	5,060	1,610	2,070	1,340	4,680	4,240	6,960	5,450	4,500	1,870	1,110
9	1,410	4,590	1,480	3,660	1,460	3,980	3,900	7,940	7,690	4,410	1,680	1,120
10	1,220	4,060	1,490	3,740	1,600	3,580	3,900	9,600	10,200	6,490	1,570	967
11	1,090	3,420	1,360	22,800	1,400	3,180	4,500	8,200	11,600	5,650	1,570	940
12	985	3,260	1,240	9,640	1,250	2,880	5,850	6,280	6,960	4,590	1,680	916
13	924	10,600	1,180	5,450	1,130	2,800	7,440	8,730	13,400	4,410	1,480	876
14	868	7,480	1,080	4,060	1,030	3,030	9,910	7,690	13,400	4,150	1,380	860
15	818	5,060	1,050	3,340	985	3,420	7,940	6,500	12,300	4,060	1,370	853
16	784	4,060	1,070	2,800	932	3,340	6,730	6,060	8,400	3,980	1,400	832
17	754	3,820	2,520	2,500	892	6,200	6,730	6,500	6,900	3,820	1,400	839
18	736	3,420	7,440	3,100	892	16,000	9,940	7,440	6,730	3,340	1,310	832
19	725	4,160	8,460	3,100	892	14,800	7,740	7,940	6,500	3,030	1,250	1,410
20	730	4,150	7,730	2,660	1,200	9,010	6,730	9,010	7,200	2,960	1,240	3,240
21	748	3,340	5,060	2,430	1,560	6,730	5,450	7,690	8,400	3,180	1,250	1,940
22	1,090	2,800	3,980	2,140	1,740	5,650	4,870	6,960	9,300	3,420	1,350	1,460
23	1,800	2,430	3,340	1,940	1,570	5,250	4,320	7,200	8,200	3,260	1,260	1,230
24	2,280	2,210	3,030	1,680	2,440	6,920	4,150	6,280	7,200	8,100	1,220	1,110
25	2,360	2,210	2,800	1,740	11,600	8,200	4,150	5,450	6,730	3,030	1,200	1,050
26	2,880	1,940	2,500	1,680	55,600	6,280	5,060	4,680	6,730	2,800	1,220	976
27	2,830	1,740	2,280	1,580	34,400	5,250	6,280	4,410	6,960	2,580	1,170	932
28	6,710	1,610	2,070	1,480	19,200	7,200	6,280	4,680	6,960	2,660	1,150	892
29	5,880	1,560	1,870	1,370	10,900	6,730	5,850	5,850	7,200	2,360	1,240	846
30	4,500	1,490	1,740	1,310	-----	6,730	6,730	6,960	6,200	2,210	1,300	832
31	3,900	-----	1,680	1,200	-----	6,960	-----	6,960	-----	2,070	1,220	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	6,710	725	2,020	3.78	4.36	124,000
November	10,600	1,490	3,860	7.21	8.04	230,000
December	8,460	1,050	2,510	4.69	5.41	154,000
January	22,800	1,200	3,230	6.04	6.96	199,000
February	55,600	892	5,570	10.4	11.22	320,000
March	16,000	2,800	6,400	12.0	13.83	394,000
April	9,910	3,900	6,050	11.3	12.61	360,000
May	9,600	4,410	6,970	13.0	14.99	429,000
June	13,400	5,060	7,980	14.9	16.62	475,000
July	9,300	2,070	4,230	7.91	9.12	260,000
August	2,140	1,150	1,520	2.84	3.27	93,500
September	3,240	832	1,140	2.13	2.38	67,800
The year	55,600	725	4,280	8.00	108.81	3,110,000

BECKLER RIVER NEAR SKYKOMISH, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 18, T. 26 N., R. 12 E., 4 miles northeast of Skykomish.

DRAINAGE AREA.—95 square miles.

RECORDS AVAILABLE.—September 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 10,000 second-feet Feb. 26 (gage height, 9.10 feet); minimum, 71 second-feet Sept. 16, 17.

1929-32: Maximum discharge, that of Feb. 26, 1932; minimum probably occurred during period Jan. 9-29, 1930, when stage-discharge relation was affected by ice.

REMARKS.—Records below 3,000 second-feet excellent except those for Jan. 17 to Feb. 8, which were estimated. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	117	632	227	244	170	1,280	1,150	1,420	1,280	1,030	231	141
2.....	98	718	227	234		1,020	1,150	1,320	1,240	958	224	116
3.....	93	495	218	224		849	1,070	1,280	1,190	1,150	210	102
4.....	158	421	215	227		800	958	1,280	1,240	1,280	197	94
5.....	403	381	212	248		1,200	886	1,190	1,110	918	197	92
6.....	259	710	206	304	155	966	793	1,190	998	779	187	89
7.....	197	996	215	274		779	730	1,320	974	737	181	87
8.....	167	714	212	274		677	677	1,320	1,010	710	178	107
9.....	156	664	203	421		602	652	1,460	1,370	677	168	102
10.....	142	564	206	403		179	551	664	1,690	1,910	835	89
11.....	134	500	179	2,290	176	497	765	1,500	2,160	758	162	84
12.....	130	559	170	1,240	173	463	990	1,500	2,430	639	162	84
13.....	120	1,350	164	812	164	449	1,240	1,600	2,500	596	153	82
14.....	112	984	164	628	162	468	1,600	1,460	2,500	568	147	82
15.....	107	756	162	525	162	473	1,370	1,240	2,290	540	138	78
16.....	103	622	167	466	159	478	1,240	1,150	1,640	524	138	76
17.....	100	552	350	620	159	782	1,150	1,190	1,370	487	132	76
18.....	98	485	770		148	1,830	1,190	1,370	1,280	454	127	74
19.....	93	520	944		140	1,920	1,240	1,420	1,280	416	121	183
20.....	105	480	798		170	1,320	1,070	1,600	1,320	398	121	237
21.....	98	408	622		179	1,070	934	1,420	1,500	394	127	135
22.....	148	364	525	370	185	902	814	1,320	1,640	389	138	107
23.....	209	336	462		182	814	751	1,320	1,500	372	118	100
24.....	241	316	430		307	1,010	723	1,240	1,320	350	113	94
25.....	270	312	390		1,170	1,110	765	1,070	1,240	337	107	89
26.....	296	293	356		7,240	902	942	934	1,190	316	105	87
27.....	323	274	332	245	4,640	800	1,110	878	1,240	292	102	84
28.....	658	250	308		2,860	1,010	1,150	886	1,240	280	100	82
29.....	646	255	289		1,690	934	1,110	1,070	1,240	261	113	80
30.....	569	237	274		-----	886	1,240	1,240	1,110	253	113	76
31.....	536	-----	259	-----	-----	966	-----	1,320	-----	238	107	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	658	93	222	2.34	2.70	13,600
November.....	1,350	237	539	5.67	6.33	32,100
December.....	944	162	331	3.48	4.01	20,400
January.....	2,290	-----	471	4.96	5.72	29,000
February.....	7,240	-----	750	7.90	8.52	43,100
March.....	1,920	449	897	9.44	10.88	55,200
April.....	1,600	652	1,000	10.5	11.71	59,500
May.....	1,690	878	1,300	13.7	15.79	79,900
June.....	2,500	974	1,480	15.6	17.40	88,100
July.....	1,280	238	579	6.09	7.02	35,600
August.....	231	100	148	1.56	1.80	9,100
September.....	237	74	100	1.05	1.17	5,950
The year.....	7,240	74	649	6.83	93.05	472,000

## NORTH FORK OF SKYKOMISH RIVER AT INDEX, WASH.

LOCATION.—Chain gage in SE¼ sec. 17, T. 27 N., R. 10 E., on highway bridge at Index, 1¼ miles above mouth.

DRAINAGE AREA.—149 square miles.

RECORDS AVAILABLE.—August 1910 to September 1922; February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, about 21,000 second-feet Feb. 26 (gage height, 10.5 feet); minimum, 224 second-feet Oct. 19.

1910-22, 1929-32: Maximum discharge, that of Feb. 26, 1932; minimum, 78 second-feet Sept. 25, 1930.

REMARKS.—Records good except those of discharge above 5,070 second-feet. Discharge estimated Jan. 26, Feb. 10. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	560	1,630	384	453	307	2,400	2,910	3,120	2,700	2,500	677	437
2.....	455	1,770	396	408	307	1,900	2,700	2,910	2,700	2,200	665	344
3.....	372	1,220	372	384	307	1,450	2,400	2,700	2,400	3,980	605	302
4.....	384	980	360	420	293	1,520	2,000	2,700	2,500	3,120	665	296
5.....	1,920	890	360	453	293	3,980	1,900	2,500	2,200	2,100	641	275
6.....	1,020	1,020	360	715	302	2,500	1,520	2,400	1,800	1,710	665	296
7.....	715	2,160	402	598	344	1,900	1,340	2,700	1,800	1,900	641	296
8.....	598	1,560	414	560	349	1,430	1,170	2,700	2,000	1,800	575	496
9.....	486	1,440	390	1,120	390	1,010	1,060	2,910	2,910	1,710	515	350
10.....	420	1,220	390	1,020	450	1,010	1,170	3,330	3,540	3,760	454	280
11.....	384	1,020	390	9,080	372	851	1,430	2,910	4,200	2,200	515	280
12.....	349	980	344	2,420	339	795	2,100	2,910	4,650	1,710	488	270
13.....	318	4,250	318	1,500	302	767	3,120	3,120	4,880	1,710	420	260
14.....	293	2,250	293	1,170	279	938	4,420	2,910	4,650	1,710	392	245
15.....	265	1,630	288	935	260	1,010	2,910	2,400	4,420	1,710	413	250
16.....	256	1,170	288	845	248	938	2,910	2,200	3,120	1,620	446	250
17.....	248	1,170	396	715	240	2,910	2,300	2,400	2,700	1,520	406	250
18.....	240	980	2,600	980	240	6,860	2,700	2,910	2,700	1,260	392	250
19.....	224	1,560	2,990	890	236	4,420	2,910	2,910	2,500	1,090	385	255
20.....	279	1,070	2,420	800	339	3,120	2,300	3,330	2,700	1,090	385	605
21.....	232	890	1,380	800	378	2,200	1,900	3,120	3,330	1,170	371	406
22.....	420	800	1,120	598	384	1,900	1,620	2,700	3,540	1,260	385	308
23.....	598	715	935	560	372	1,710	1,340	2,700	2,910	1,170	350	314
24.....	715	635	935	523	675	3,120	1,340	2,300	2,700	1,170	378	314
25.....	845	635	800	523	2,250	3,120	1,430	2,000	2,500	1,260	378	296
26.....	980	560	715	488	18,600	2,000	1,900	1,710	2,700	908	378	265
27.....	1,020	560	635	453	9,490	1,710	2,500	1,620	2,700	865	350	250
28.....	2,600	453	598	408	5,590	2,500	2,400	1,710	3,120	908	350	240
29.....	1,770	420	523	378	3,330	2,400	2,100	2,300	2,910	725	385	240
30.....	1,560	420	486	378	-----	2,300	2,700	2,700	2,500	713	344	236
31.....	1,320	-----	453	339	-----	2,300	-----	2,700	-----	653	314	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	2,600	224	705	4.73	5.45	43,300
November.....	4,250	420	1,200	8.05	8.98	71,400
December.....	2,990	288	733	4.92	5.67	45,100
January.....	9,080	339	997	6.69	7.71	61,300
February.....	18,600	236	1,630	10.9	11.76	93,800
March.....	6,860	767	2,160	14.5	16.72	133,000
April.....	4,420	1,090	2,150	14.4	16.07	128,000
May.....	3,330	1,620	2,630	17.7	20.41	162,000
June.....	4,880	1,800	3,000	11.1	22.43	179,000
July.....	3,980	653	1,650	11.1	12.80	101,000
August.....	677	314	462	3.10	3.57	28,400
September.....	605	236	305	2.05	2.29	18,100
The year.....	18,600	224	1,470	9.87	133.86	1,060,000

OLNEY CREEK NEAR STARTUP, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 12, T. 28 N., R. 8 E., 1½ miles above Stickney Bridge and 5 miles northeast of Startup.

DRAINAGE AREA.—10 square miles.

RECORDS AVAILABLE.—October 1922 to October 1926; February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 2,400 second-feet Feb. 23 (gage height, 7.50 feet); minimum, 12 second-feet Oct. 18–20.

1922–26, 1929–32: Maximum discharge, that of Feb. 26, 1932; minimum 3.8 second-feet Oct. 16, 1925 (gage height, 0.67 foot).

REMARKS.—Records good. Discharge estimated Oct. 29, 30, Mar. 29, 30. No diversions or regulation.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	44	200	31	40	23	134	349	130	105	60	39	35
2.....	37	199	47	35	22	105	274	122	95	54	27	25
3.....	36	100	47	33	23	81	247	113	90	190	24	21
4.....	246	73	49	52	21	137	164	110	95	208	22	20
5.....	464	63	62	120	21	982	153	108	86	81	21	19
6.....	154	100	51	140	22	286	127	99	73	64	19	18
7.....	96	134	85	82	30	148	119	99	70	60	18	17
8.....	73	123	79	102	39	104	105	95	82	56	18	39
9.....	57	121	59	362	37	81	88	117	114	55	18	26
10.....	43	98	53	179	34	68	93	134	135	228	20	21
11.....	35	77	45	920	30	58	114	99	136	150	58	22
12.....	28	95	38	214	27	51	146	106	145	86	42	22
13.....	23	517	34	105	23	54	160	106	139	70	28	20
14.....	19	194	30	75	21	159	237	85	138	68	23	18
15.....	16	113	28	59	21	157	137	70	106	69	21	17
16.....	14	88	32	50	19	134	160	70	69	64	19	16
17.....	13	111	245	53	18	686	218	86	67	52	18	16
18.....	13	96	498	244	17	1,030	334	102	69	45	17	16
19.....	12	366	375	140	17	667	347	122	72	42	18	184
20.....	20	170	193	94	21	289	213	133	82	42	55	87
21.....	16	98	116	71	57	177	142	99	93	43	37	45
22.....	69	73	82	56	62	136	113	142	86	42	33	33
23.....	92	59	65	48	52	130	108	121	73	38	28	28
24.....	101	51	68	42	107	255	98	85	67	38	25	26
25.....	126	56	62	42	588	356	93	72	70	39	22	25
26.....	179	46	53	36	1,470	189	119	67	76	31	21	22
27.....	143	41	51	35	725	162	136	64	77	30	20	21
28.....	269	37	46	32	344	363	114	78	77	27	20	20
29.....	202	33	39	29	185	316	99	95	76	31	21	19
30.....	135	31	35	27	-----	269	113	190	63	24	22	18
31.....	68	-----	37	25	-----	222	-----	130	-----	25	22	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	464	12	91.7	9.17	10.57	5,640
November.....	517	31	119	11.9	13.28	7,080
December.....	498	28	88.2	8.82	10.17	5,420
January.....	920	25	114	11.4	13.14	7,010
February.....	1,470	17	141	14.1	15.21	8,110
March.....	1,030	51	258	25.8	29.74	15,900
April.....	349	88	164	16.4	18.30	9,760
May.....	190	64	105	10.5	12.11	6,460
June.....	145	63	90.9	9.09	10.14	5,410
July.....	228	24	68.1	6.81	7.85	4,190
August.....	58	17	25.7	2.57	2.96	1,580
September.....	184	16	30.5	3.05	3.40	1,810
The year.....	1,470	12	108	10.8	146.87	78,400



## MIDDLE FORK OF SNOQUALMIE RIVER NEAR NORTH BEND, WASH.

LOCATION.—Staff gage in sec. 34, T. 24 N., R. 8 E., at highway bridge 1½ miles north of North Bend.

DRAINAGE AREA.—173 square miles.

RECORDS AVAILABLE.—August 1907 to September 1926; February 1929 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 18,100 second-feet Feb. 26 (gage height, 13.5 feet); minimum, 236 second-feet Oct. 19, 20.

1907-26, 1929-32: Maximum discharge, 18,300 second-feet Dec. 18, 1917; discharge may have been greater during floods of November 1909 and November 1910. Minimum, 102 second-feet Oct. 24, 1925 (gage height, 1.15 feet).

REMARKS.—Records good. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	370	1,530	465	515	490	5,140	2,910	2,310	2,200	1,780	480	480
2.....	330	2,070	465	465	490	2,060	2,550	1,980	1,980	1,210	480	480
3.....	330	1,370	440	440	490	1,300	2,430	1,780	1,880	3,450	480	385
4.....	290	970	415	570	465	1,130	1,780	1,680	1,880	3,450	480	345
5.....	2,580	900	465	630	415	7,180	1,680	1,680	1,390	3,300	480	326
6.....	1,370	900	440	1,450	490	3,780	1,390	1,580	1,300	2,910	455	307
7.....	865	3,290	465	900	490	1,050	1,130	1,880	1,210	2,090	430	326
8.....	660	1,890	570	760	570	1,390	1,050	1,680	1,300	1,130	430	307
9.....	465	1,710	515	3,160	570	1,130	910	2,090	2,090	1,210	408	307
10.....	415	1,530	515	1,800	630	910	980	3,160	3,030	2,200	385	289
11.....	370	1,210	465	10,800	570	810	1,300	2,200	3,450	1,880	385	289
12.....	330	970	415	3,720	570	720	980	2,310	3,780	1,300	385	271
13.....	310	6,350	370	1,370	570	690	2,310	2,550	3,950	1,130	430	271
14.....	290	3,030	370	1,290	415	1,050	3,780	1,980	3,610	1,130	385	254
15.....	270	1,980	330	1,050	370	1,210	2,430	1,880	3,610	1,050	365	254
16.....	250	1,450	330	970	330	980	1,980	1,390	2,090	980	365	254
17.....	270	1,290	2,370	830	330	1,780	1,880	1,680	1,680	980	365	254
18.....	250	1,370	4,990	2,070	330	4,290	3,160	2,090	1,680	940	345	271
19.....	236	1,530	3,030	1,620	330	4,970	3,300	2,090	1,680	720	326	307
20.....	236	1,620	2,690	1,210	370	3,030	2,090	2,670	1,980	690	345	1,130
21.....	250	1,210	1,890	830	630	1,880	1,390	2,200	2,430	660	345	540
22.....	415	935	1,370	865	690	1,480	1,210	2,200	2,790	810	345	408
23.....	1,130	795	1,130	760	630	1,480	1,050	2,550	2,310	780	326	385
24.....	1,210	690	1,010	690	900	2,090	980	1,880	1,980	720	326	345
25.....	1,210	725	935	690	2,070	2,670	910	1,480	1,780	720	307	326
26.....	1,620	630	830	630	16,200	2,090	1,210	1,210	1,780	660	307	307
27.....	1,290	570	690	570	8,610	1,580	1,680	1,050	1,980	600	307	307
28.....	7,430	515	630	570	5,310	3,160	1,580	1,210	1,880	600	307	289
29.....	4,340	515	600	515	3,300	2,310	1,390	1,780	1,980	540	430	271
30.....	2,580	465	542	515	-----	2,790	1,780	2,550	1,980	510	455	254
31.....	1,890	-----	515	515	-----	2,550	-----	2,430	-----	480	540	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	7,430	236	1,090	6.30	7.26	67,000
November.....	6,350	465	1,470	8.50	9.48	87,500
December.....	4,990	330	976	5.64	6.50	60,000
January.....	10,800	440	1,380	7.98	9.20	84,800
February.....	16,200	330	1,640	9.48	10.22	94,300
March.....	7,180	690	2,220	12.8	14.76	136,000
April.....	3,780	910	1,770	10.2	11.38	105,000
May.....	3,160	1,050	1,970	11.4	13.14	121,000
June.....	3,950	1,210	2,290	12.9	14.39	133,000
July.....	3,450	480	1,310	7.57	8.73	80,600
August.....	540	307	394	2.28	2.63	24,200
September.....	1,130	254	351	2.03	2.26	20,900
The year.....	16,200	236	1,400	8.09	109.95	1,010,000

## SNOQUALMIE RIVER NEAR TOLT, WASH.

LOCATION.—Cable gage in sec. 9, T. 25 N., R. 7 E., at highway bridge 1 mile northwest of Tolt.

DRAINAGE AREA.—605 square miles.

RECORDS AVAILABLE.—February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, about 51,000 second-feet Feb. 26 (gage height, 15.3 feet); maximum stage (result of backwater), 16.9 feet Feb. 27. Minimum discharge 598 second-feet Oct. 18 (gage height, 1.07 feet).

1929-32: Maximum discharge, that of Feb. 26, 1932; minimum, 357 second-feet Sept. 11, 1930 (gage height, 0.34 foot).

REMARKS.—Records good; discharge estimated Mar. 18. Low-water flow diverted for power purposes at Snoqualmie Falls but returned to river above gage. Some regulation of flow caused by operation of power plant.

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

Day	Oct	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,540	4,440	1,600	2,290	2,000	9,000	10,900	5,800	5,800	4,060	1,730	2,000
2.....	1,090	5,600	1,860	2,140	1,860	8,110	9,620	6,000	6,000	4,060	1,730	1,860
3.....	995	4,250	1,730	2,140	1,730	6,880	9,000	5,600	5,200	6,650	1,730	1,730
4.....	870	3,130	1,730	2,140	1,660	5,800	7,350	5,400	5,400	7,840	1,660	1,660
5.....	5,200	2,780	1,860	2,450	1,660	26,900	6,880	5,010	4,820	4,820	1,540	1,140
6.....	4,060	2,610	1,860	3,870	1,660	29,700	6,210	5,400	4,440	3,370	1,540	950
7.....	2,450	6,210	1,730	3,680	1,730	9,940	5,800	5,400	4,060	3,490	1,420	995
8.....	1,860	5,010	1,860	3,130	2,290	7,840	5,400	5,600	4,250	3,490	1,420	950
9.....	1,660	4,250	2,000	6,430	2,450	6,000	5,010	5,600	5,400	3,310	1,300	995
10.....	1,200	4,820	1,860	7,840	2,950	5,200	5,200	7,590	6,880	5,400	1,250	950
11.....	995	3,870	1,730	17,200	2,610	4,820	5,400	6,210	7,590	4,630	1,250	870
12.....	950	3,310	1,600	30,700	2,290	4,440	6,210	6,000	7,840	3,370	1,420	795
13.....	910	6,210	1,600	9,620	2,140	4,250	7,110	6,430	8,110	3,490	1,540	760
14.....	870	14,800	1,480	5,010	2,000	4,440	9,620	5,600	7,590	3,680	1,480	725
15.....	765	6,430	1,420	4,060	1,860	5,400	7,110	5,600	7,590	3,310	1,300	725
16.....	765	5,200	1,250	3,870	1,660	5,600	6,430	4,630	5,200	3,310	1,250	655
17.....	800	4,250	4,250	3,130	1,480	9,620	9,300	5,010	4,440	2,950	1,300	725
18.....	620	4,630	11,900	4,060	1,360	15,500	9,940	5,200	4,440	2,780	1,200	655
19.....	765	4,630	12,300	6,430	1,480	21,400	10,600	5,600	4,630	2,610	1,090	760
20.....	700	5,800	10,600	6,650	1,480	10,900	8,110	6,430	4,820	2,450	1,090	4,060
21.....	730	4,440	8,700	4,440	2,610	10,300	6,210	5,800	5,400	2,450	1,200	2,000
22.....	1,200	3,870	5,400	4,060	3,310	9,300	5,400	6,000	6,210	2,610	1,360	1,660
23.....	2,610	3,130	4,630	3,490	2,950	7,840	4,820	6,430	5,800	2,450	1,250	1,360
24.....	3,490	2,780	4,060	3,130	2,950	9,000	4,820	5,400	4,820	2,000	1,090	1,140
25.....	3,310	2,780	3,680	3,130	5,010	9,940	4,820	4,630	4,440	2,000	1,040	1,090
26.....	5,010	2,780	3,310	2,950	38,500	7,590	4,820	4,440	4,440	2,000	995	995
27.....	4,250	2,290	3,130	2,780	33,500	10,300	5,600	4,440	4,440	2,000	910	910
28.....	7,840	4,060	3,780	2,610	23,200	11,900	5,600	4,820	4,630	2,000	910	832
29.....	16,400	2,000	2,610	2,450	12,300	10,600	5,010	6,210	4,440	1,860	1,040	725
30.....	8,110	1,730	2,450	2,290	-----	10,900	5,600	6,430	4,440	1,860	1,540	760
31.....	5,600	-----	2,450	2,290	-----	9,940	-----	6,000	-----	1,730	2,000	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	16,400	620	2,830	4.68	5.40	174,000
November.....	14,800	1,730	4,400	7.27	8.11	262,000
December.....	12,300	1,250	3,530	5.83	6.72	217,000
January.....	30,700	2,140	5,180	8.56	9.87	319,000
February.....	36,500	1,360	5,540	9.16	9.88	319,000
March.....	29,700	4,250	9,980	16.5	19.02	614,000
April.....	10,900	4,820	6,800	11.7	12.50	405,000
May.....	7,590	4,440	5,620	9.79	10.71	346,000
June.....	8,110	4,060	5,450	9.01	10.05	324,000
July.....	7,840	1,730	3,320	5.49	6.33	204,000
August.....	2,000	910	1,340	2.21	2.55	82,400
September.....	4,060	655	1,180	1.95	2.18	70,200
The year.....	36,500	620	4,590	7.59	103.32	3,340,000

## NORTH FORK OF SNOQUALMIE RIVER NEAR SNOQUALMIE FALLS, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 30, T. 25 N., R. 9 E., 1 mile above Calligan Creek and 8 miles northeast of Snoqualmie Falls.

DRAINAGE AREA.—65 square miles.

RECORDS AVAILABLE.—August 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 8,020 second-feet Feb. 26 (gage height, 17.5 feet); minimum, 80 second-feet Sept. 19.

1929-32: Maximum discharge, that of Feb. 26, 1932; minimum, 30 second-feet Sept. 17-19, 1929 (gage height, 1.91 feet).

REMARKS.—Records excellent except those of discharge above 3,000 second-feet, which are good. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	J-ly	Aug.	Sept.
1	240	698	157	186	144	892	1,540	1,080	938	602	204	240
2	175	947	179	167	138	712	1,390	915	915	558	188	213
3	155	491	197	154	134	545	1,280	868	892	1,350	168	166
4	350	367	188	190	133	662	962	800	915	1,690	160	139
5	1,390	327	209	275	131	2,840	892	800	822	701	153	126
6	612	536	192	529	134	1,670	734	756	646	511	144	116
7	333	1,050	211	348	148	986	646	868	602	503	137	111
8	243	605	228	339	155	712	602	800	685	467	131	111
9	199	567	201	1,450	162	558	524	1,060	1,040	432	126	116
10	168	464	193	822	163	475	558	1,280	1,310	1,020	139	104
11	148	361	172	3,640	146	410	778	962	1,390	756	151	99
12	131	458	155	1,490	140	368	1,040	1,010	1,510	541	215	94
13	124	2,660	146	766	130	364	1,210	1,010	1,420	487	182	90
14	116	1,250	136	529	122	598	1,600	845	1,420	503	149	88
15	107	734	133	400	119	756	1,110	668	1,240	499	132	85
16	100	529	137	327	114	646	962	646	778	463	123	84
17	95	491	1,250	290	109	1,540	1,080	800	646	374	115	82
18	92	431	1,900	924	107	2,950	1,720	915	690	320	111	82
19	91	510	1,600	757	105	2,140	1,510	962	690	279	107	420
20	94	491	1,220	510	121	1,340	1,060	1,080	822	279	113	957
21	102	367	745	386	155	986	778	938	994	308	129	346
22	349	301	529	318	182	778	624	915	1,040	311	137	218
23	626	257	417	275	172	756	554	1,060	822	288	123	176
24	626	234	400	248	334	1,160	528	822	712	267	112	156
25	646	236	345	232	1,810	1,080	507	624	690	273	106	142
26	712	215	206	213	5,900	822	723	511	734	246	102	129
27	679	195	265	205	3,490	809	962	491	734	218	100	119
28	2,600	177	236	190	2,190	1,560	868	646	723	211	104	112
29	1,530	163	213	177	1,280	1,310	734	892	732	192	206	107
30	938	157	197	168	-----	1,360	915	1,260	626	182	194	102
31	712	-----	190	154	-----	1,420	-----	1,110	-----	166	192	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acro-feet
October	2,600	91	467	7.18	8.28	28,700
November	2,660	157	542	8.34	9.30	32,300
December	1,900	133	408	6.28	7.24	25,100
January	3,640	154	537	8.26	9.52	33,000
February	5,900	105	626	9.63	10.39	36,000
March	2,950	364	1,070	16.5	19.02	65,800
April	1,720	507	946	14.6	16.29	56,300
May	1,280	491	884	13.6	15.68	54,400
June	1,510	602	906	13.9	15.51	53,900
July	1,690	166	483	7.43	8.57	29,700
August	215	100	144	2.22	2.56	8,850
September	957	82	171	2.63	2.93	10,200
The year	5,900	82	598	9.20	125.29	434,000

## NORTH FORK OF SNOQUALMIE RIVER NEAR NORTH BEND, WASH.

LOCATION.—Water-stage recorder in NE¼ sec. 26, T. 24 N., R. 8 E., 2 miles above mouth and 3½ miles northeast of North Bend.

DRAINAGE AREA.—105 square miles.

RECORDS AVAILABLE.—July 1907 to September 1926; February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, about 11,000 second-feet Feb. 26 (gage height, 11.55 feet); minimum, 108 second-feet Sept. 19 (gage height, 1.92 feet).

1907-26, 1929-32: Maximum discharge, 11,100 second-feet Nov. 18, 1911 (gage height, 14.5 feet from high-water mark); water above gage Nov. 18, 19, 23, 24, 29, 30, 1909; stage and discharge may have exceeded those of 1911. Minimum, 54 second-feet Aug. 31, Sept. 1, 1930.

REMARKS.—Records good. Discharge estimated Nov. 21-30, May 2-15, July 18 to Aug. 1. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	319	913	296	349	279	1,640	2,080	1,640	1,470	910	250	287
2.	245	1,210	324	328	272	1,370	2,020		1,420	861	236	293
3.	225	745	342	310	253	1,090	1,910	1,350	1,420	1,740	229	252
4.	348	592	328	361	244	1,140	1,470		1,470	2,030	219	216
5.	1,550	525	349	423	241	3,330	1,370		1,320	1,190	208	192
6.	830	617	335	776	241	2,490	1,130		1,140	890	195	180
7.	538	1,280	342	589	250	1,640	1,010		1,060	816	187	167
8.	403	816	374	550	263	1,320	1,090		1,090	762	180	158
9.	332	784	342	1,750	269	1,020	1,000	1,500	1,440	690	174	167
10.	284	678	335	1,200	272	890	1,020		1,800	1,360	192	146
11.	250	558	306	4,150	253	771	1,260		2,020	1,200	197	136
12.	222	620	286	1,920	244	699	1,640		2,130	870	289	129
13.	208	2,900	272	1,060	231	665	1,910		2,130	762	264	125
14.	192	1,700	256	808	216	890	2,430	1,300	2,080	807	222	121
15.	179	1,040	244	643	208	1,120	1,800		1,830	789	200	117
16.	167	808	250	550	200	1,000	1,580	1,090	1,270	735	184	112
17.	161	730	1,340	496	192	1,900	1,690	1,270	1,110	606	172	112
18.	155	671	2,310	1,090	190	3,360	2,430	1,470	1,120	430	160	112
19.	151	722	2,010	968	187	2,790	2,430	1,470	1,100		151	384
20.	153	730	1,680	722	208	1,910	1,800	1,640	1,190	153	1,350	
21.	165	480	1,070	615	260	1,420	1,420	1,520	1,370	350	177	576
22.	435		824	526	292	1,190	1,180	1,520	1,470		180	351
23.	776		678	470	282	1,140	1,070	1,640	1,230		170	277
24.	800		636	431	427	1,540	1,000	1,370	1,090		153	239
25.	856		563	417	1,850	1,470	940	1,140	1,040		142	214
26.	936	330	502	386	7,840	1,260	1,170	950	1,080	250	134	192
27.	893		465	369	3,160	1,160	1,470	870	1,110		127	177
28.	3,120		422	349	4,380	1,990	1,370	1,030	1,070		138	162
29.	2,150		386	324	2,130	1,860	1,210	1,320	1,080		262	151
30.	1,330		361	310		1,960	1,420	1,850	960		283	142
31.	1,020		353	289		1,960	1,420	1,690		281		

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	3,120	151	626	5.96	6.87	38,500
November	2,900		756	7.20	8.03	45,000
December	2,310	244	599	5.70	6.57	36,800
January	4,150	289	759	7.23	8.34	46,700
February	7,840	187	874	8.32	8.97	50,300
March	3,360	665	1,550	14.8	17.03	95,300
April	2,430	940	1,510	14.4	16.07	89,800
May		870	1,400	13.3	15.33	86,100
June	2,130	960	1,370	13.0	14.50	81,500
July	2,030		695	6.62	7.63	42,700
August	293	127	197	1.88	2.17	12,100
September	1,350	112	241	2.30	2.57	14,300
The year	7,840	112	880	8.38	114.11	639,000

## SOUTH FORK OF SNOQUALMIE RIVER AT NORTH BEND, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 9, T. 23 N., R. 8 E., half a mile south of North Bend and 3½ miles above mouth.

DRAINAGE AREA.—84 square miles.

RECORDS AVAILABLE.—July 1907 to September 1926; February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 7,600 second-feet Feb. 26 (gage height, 11.18 feet); minimum, 104 second-feet Oct. 19-20 (gage height, 1.37 feet).

1907-26, 1929-32: Water over gage Nov. 3, 4, 19, 23, 27, 1909 (gage height and discharge not determined); minimum discharge, 63 second-feet Oct. 22, 1925 (gage height, 1.14 feet).

REMARKS.—Records good except those estimated, which are poor. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	153	670	291	312	376	1,400	1,550	1,250	1,080	698	340	200
2	138		291	297	364	1,220	1,600	1,180	1,050	675		
3	131		283	291	355	1,000	1,450	1,100	1,050	855		
4	144		339	280	315	348	1,050	1,300	1,080	939		
5	322	315	280	352	348	2,750	1,220	1,080	950	698	300	153
6	324	328	274	444	348	2,250	1,080	1,020	855	610		
7	247	848	280	421	380	1,500	1,000	1,100	832	590		
8	205	615	291	414	411	1,250	950	1,080	855	570		
9	181	615	280	950	444	1,080	878	1,180	1,060	550	275	148
10	167	560	291	950	460	975	878	1,450	1,300	655		
11	153	460	271	2,980	414	900	950	1,250	1,450	610		
12	142	427	260	2,130	398	832	1,100	1,220	1,500	550		
13	136	1,460	250	1,220	376	810	1,300	1,300	1,500	530	200	134
14	131	1,350	240	925	358	832	1,650	1,180	1,400	550		
15	125	878	232	765	342	855	1,450	1,020	1,400	550		
16	117	675	232	655	330	832	1,300	950	1,020	510		
17	111	615	394	595	321	1,250	1,300	1,000	878	498	220	122
18	109	578	925	675	312	2,080	1,450	1,120	878	464		
19	105	655	855	675	303	2,300	1,600	1,150	855	430		
20	107	655	855	615	370	1,700	1,350	1,250	900	420		
21	109	526	698	578	460	1,350	1,150	1,150	1,000	423	200	169
22	119	460	578	543	460	1,200	1,020	1,180	1,100	423		
23	119	414	510	510	417	1,180	925	1,220	950	405		
24	580	383	476	476	510	1,500	878	1,100	855	365		
25		380	444	476	935	1,600	832	950	810	392	225	144
26		358	411	460	5,360	1,300	878	832	810	378		
27		336	386	460	4,200	1,150	1,020	788	810	364		
28	1,100	321	364	427	2,620	1,450	1,020	810	788	357	200	128
29		309	345	417	1,760	1,450	975	950	788	346		
30		300	330	408	389	1,450	1,080	1,100	742	336		
31			324			1,450		1,100		326		

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	#Acre-feet
October		105	333	3.96	4.56	20,500
November	1,460	300	572	6.81	7.60	34,000
December	925	232	394	4.69	5.41	24,200
January	2,980	291	681	8.11	9.35	41,900
February	5,360	303	830	9.88	10.66	47,700
March	2,750	810	1,350	16.1	18.56	83,000
April	1,650	832	1,170	13.9	15.51	69,600
May	1,450	788	1,100	13.1	15.10	67,600
June	1,500	742	1,020	12.1	13.50	60,700
July	939	326	519	6.18	7.12	31,900
August			259	3.08	3.55	15,900
September	304	122	160	1.90	2.12	9,520
The year	5,360	105	698	8.31	113.04	507,000

TOLT RIVER NEAR TOLT, WASH.

LOCATION.—Water-stage recorder in sec. 31, T. 26 N., R. 8 E., 150 feet below forks and 6 miles northeast of Tolt.

DRAINAGE AREA.—80 square miles.

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

EXTREMES.—Maximum discharge during period Oct. 1, 1931 to Jan. 3, 1932, 3,070 second-feet Nov. 13 (gage height, 6.64 feet); minimum, 139 second-feet Oct. 20 (gage height, 1.38 feet).

1928-32: Maximum discharge not determined; probably occurred Feb. 1, 1930; minimum, 65 second-feet Sept. 11, 1928 (gage height, 0.79 foot).

REMARKS.—Records good. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Day	Oct.	Nov.	Dec.	Jan.
1.....	311	666	328	395	16.....	160	668	286	-----
2.....	234	841	380	362	17.....	154	689	1,100	-----
3.....	207	552	377	352	18.....	149	668	2,090	-----
4.....	435	454	359	-----	19.....	143	869	1,800	-----
5.....	1,230	409	428	-----	20.....	145	800	1,360	-----
6.....	611	515	388	-----	21.....	149	628	900	-----
7.....	417	830	424	-----	22.....	368	533	689	-----
8.....	324	668	465	-----	23.....	571	476	609	-----
9.....	274	732	402	-----	24.....	648	446	571	-----
10.....	242	648	402	-----	25.....	690	495	552	-----
11.....	217	552	356	-----	26.....	825	446	495	-----
12.....	200	630	328	-----	27.....	865	409	476	-----
13.....	187	2,400	305	-----	28.....	1,940	373	446	-----
14.....	178	1,320	286	-----	29.....	1,180	356	409	-----
15.....	166	825	274	-----	30.....	755	331	384	-----
					31.....	590	-----	388	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	1,940	143	470	5.88	6.78	28,900
November.....	2,400	331	674	8.42	9.39	40,100
December.....	2,090	274	582	7.28	8.39	35,800
January 1-3.....	395	352	370	4.62	.52	2,200
The period.....	-----	-----	-----	-----	-----	107,000

## STILLAGUAMISH RIVER BASIN

## SOUTH FORK OF STILLAGUAMISH RIVER AT SILVERTON, WASH.

LOCATION.—Staff gage in SE¼NE¼ sec. 24, T. 30 N., R. 9 E., three quarters of a mile below Silverton.

DRAINAGE AREA.—38.4 square miles.

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

EXTREMES.—Maximum discharge during year, about 8,800 second-feet Jan. 11 (gage height, 8.5 feet); stage and discharge possibly higher Feb. 26; minimum, 58 second-feet Sept. 30 (gage height, 0.67 foot).

1929-32: Maximum discharge, that of Jan. 11 or Feb. 26, 1932; minimum, 24 second-feet Sept. 1, 2, 1930.

REMARKS.—Records good except those of discharge above 2,000 second-feet, which are fair. Discharge estimated because of ice Jan. 31, Feb. 1-5, 13-20. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	276	1,020	96	128	160	560	1,000	780	620	480	244	212
2.....	192	970	133	128		437	745	710	560	458	228	138
3.....	155	460	149	107		416	650	650	530	1,350	244	111
4.....	355	355	146	107		317	530	620	560	815	228	92
5.....	925	308	146	166		1,040	530	590	480	505	244	81
6.....	405	1,020	138	228	175	560	416	560	416	416	244	86
7.....	267	1,170	182	179	244	395	437	650	416	416	228	90
8.....	196	1,280	155	158	228	336	376	620	505	396	212	355
9.....	160	520	144	430	228	298	356	710	745	396	198	198
10.....	163	355	128	355	244	262	356	850	920	1,170	170	164
11.....	124	285	114	5,470	244	228	480	710	1,080	680	156	125
12.....	110	355	105	960	198	212	680	710	1,080	480	175	111
13.....	101	2,120	101	590		212	815	745	1,040	437	144	86
14.....	90	745	92	480		376	1,040	620	1,080	505	140	76
15.....	84	490	90	396		416	710	505	850	480	149	72
16.....	72	330	88	356	140	396	650	505	560	480	167	72
17.....	70	285	1,520	336		885	650	500	480	416	164	64
18.....	69	232	1,880	1,040		2,120	815	650	480	356	144	61
19.....	66	355	2,390	620		1,450	960	710	480	298	133	73
20.....	76	280	970	458		745	620	850	620	317	140	228
21.....	69	215	520	396	167	530	480	650	745	336	131	198
22.....	236	182	380	376	198	437	437	620	710	376	138	142
23.....	380	160	285	317	198	437	396	745	590	356	129	109
24.....	430	144	285	298	356	780	396	590	530	336	127	100
25.....	405	144	267	279	2,240	680	437	480	530	396	127	92
26.....	430	133	262	244	7,840	458	590	437	560	317	125	80
27.....	490	119	192	262	3,560	416	680	416	590	298	115	67
28.....	970	110	166	262	1,550	885	650	458	590	279	109	64
29.....	620	105	149	228	780	590	590	530	590	244	138	61
30.....	460	99	133	228	-----	560	710	620	505	228	133	58
31.....	430	-----	133	200	-----	680	-----	620	-----	212	113	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	970	66	286	7.45	8.59	17,600
November.....	2,120	99	478	12.4	13.83	28,400
December.....	2,360	88	371	9.66	11.14	22,800
January.....	5,470	107	509	13.3	15.33	31,300
February.....	7,840	-----	702	18.3	19.74	40,400
March.....	2,120	212	584	15.2	17.52	35,900
April.....	1,040	356	606	15.8	17.63	36,100
May.....	1,850	416	623	16.4	18.91	38,600
June.....	1,080	416	648	16.9	18.86	38,600
July.....	1,350	212	453	12.0	13.83	28,200
August.....	244	109	166	4.32	4.98	10,200
September.....	356	58	115	2.99	3.34	6,840
The year.....	7,840	58	462	12.0	163.70	338,000

## SOUTH FORK OF STILLAGUAMISH RIVER NEAR GRANITE FALLS, WASH.

LOCATION.—Water-stage recorder in SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec. 8, T. 30 N., R. 7 E., 2 miles northeast of Granite Falls.

DRAINAGE AREA.—119 square miles.

RECORDS AVAILABLE.—July 1928 to September 1932.

EXTREMES.—Maximum discharge during year, about 26,700 second-feet Feb. 26 (gage height, 19.7 feet, from graph based on gage readings); minimum, 166 second-feet Sept. 19.

1928-32: Maximum discharge, that of Feb. 26, 1932; minimum, 66 second-feet Sept. 4, 1930 (gage height, 3.05 feet).

REMARKS.—Records excellent except those for extremely high stages, which are good. Discharge estimated Mar. 4-6, 8, 12-13. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	734	2,310	348	660	368	1,780	3,530	1,890	1,480	948	414	365
2.....	490	2,980	501	525	368	1,400	2,820	1,670	1,300	863	386	318
3.....	392	1,340	654	476	364	1,100	2,590	1,580	1,220	2,400	368	244
4.....	1,060	930	618	576	356	1,000	1,950	1,480	1,300	2,420	390	213
5.....	2,780	783	648	1,030	364	3,600	2,260	1,400	1,180	1,180	400	196
6.....	1,190	2,050	546	1,450	392	2,000	1,580	1,300	984	821	386	191
7.....	755	2,880	1,340	846	476	1,440	1,400	1,440	919	772	368	188
8.....	558	1,700	1,190	784	660	1,150	1,300	1,350	1,020	772	350	734
9.....	458	1,960	741	2,430	702	919	1,100	1,580	1,460	751	314	504
10.....	392	1,310	648	1,600	666	814	1,100	2,010	1,950	2,960	299	322
11.....	348	965	530	9,560	510	758	1,300	1,580	2,070	2,360	295	270
12.....	309	1,050	458	2,970	450	700	1,780	1,580	2,200	1,220	322	290
13.....	278	6,380	422	1,540	400	700	2,070	1,580	2,200	988	270	225
14.....	254	2,620	380	1,120	360	1,620	3,200	1,350	2,140	1,180	250	207
15.....	237	1,560	356	895	352	1,720	1,950	1,100	1,890	1,100	254	194
16.....	218	1,120	372	769	316	1,400	1,940	1,020	1,260	1,140	260	183
17.....	209	1,500	4,040	715	293	3,970	2,330	1,180	1,020	898	257	175
18.....	198	1,080	6,080	3,780	297	7,290	2,900	1,400	1,020	737	237	175
19.....	186	1,980	6,250	2,190	297	5,020	3,720	1,580	980	617	231	1,000
20.....	195	1,290	3,140	1,380	454	3,010	2,440	1,950	1,180	641	350	965
21.....	200	874	1,800	1,040	775	1,890	1,620	1,480	1,580	635	318	490
22.....	779	696	1,240	881	804	1,480	1,300	1,350	1,480	710	281	350
23.....	1,380	588	1,000	741	648	1,480	1,180	1,620	1,220	672	257	281
24.....	1,600	525	1,330	648	1,110	3,360	1,100	1,300	1,060	611	237	263
25.....	1,700	564	1,160	648	6,760	3,590	1,100	1,100	1,020	710	237	250
26.....	1,650	500	923	588	20,200	2,010	1,480	956	1,060	605	234	228
27.....	1,630	432	916	552	11,500	1,580	1,780	884	1,100	528	225	207
28.....	2,740	396	748	505	5,740	3,740	1,620	996	1,100	528	219	196
29.....	1,670	368	624	463	2,900	2,610	1,400	1,260	1,140	454	234	188
30.....	1,160	344	552	436	-----	3,050	1,620	1,780	1,010	404	270	183
31.....	1,000	-----	582	400	-----	2,610	-----	1,620	-----	381	234	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	2,780	186	863	7.25	8.36	53,100
November.....	6,380	344	1,440	12.1	13.50	85,700
December.....	6,250	348	1,290	10.8	12.45	79,300
January.....	9,560	400	1,360	11.4	13.14	83,600
February.....	20,200	293	2,030	17.1	18.44	117,000
March.....	7,290	700	2,220	18.7	21.56	136,000
April.....	3,720	1,100	1,920	16.1	17.96	114,000
May.....	2,010	884	1,430	12.0	13.83	87,900
June.....	2,200	919	1,350	11.3	12.61	80,300
July.....	2,960	381	1,000	8.40	9.68	61,500
August.....	414	219	295	2.48	2.86	18,100
September.....	1,000	175	319	2.68	2.99	19,000
The year.....	20,200	175	1,290	10.8	147.38	936,000



## SOUTH FORK OF STILLAGUAMISH RIVER NEAR ARLINGTON, WASH.

LOCATION.—Staff gage in NW¼ sec. 7, T. 31 N., R. 6 E., 1½ miles east of Arlington.

DRAINAGE AREA.—254 square miles.

RECORDS AVAILABLE.—December 1928 to September 1932.

EXTREMES.—Maximum discharge during year, about 35,000 second-feet Feb. 26 (gage height, 14.40 feet); minimum, 236 second-feet Sept. 18.

1928-32: Maximum discharge, that of Feb. 26, 1932; minimum, 108 second-feet Sept. 6, 1930 (gage height, 2.08 feet).

REMARKS.—Records good. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,260	1,370	710	1,370	915	3,840	6,100	2,950	2,330	1,380	620	380
2	790	5,160	670	1,260	870	3,120	4,430	2,790	1,910	1,320	580	510
3	630	2,300	1,260	1,050	830	2,630	5,260	2,330	1,910	1,150	580	380
4	560	1,550	1,100	1,150	830	2,330	3,470	2,330	1,770	4,230	580	330
5	6,440	1,200	1,260	1,260	790	11,100	4,430	2,190	1,770	2,050	580	285
6	2,150	1,260	1,000	3,450	790	7,440	3,470	2,050	1,640	1,320	545	276
7	1,320	4,760	1,100	1,740	1,050	3,650	2,790	2,190	1,380	1,200	510	254
8	960	2,300	2,940	1,370	1,320	2,630	2,790	2,190	1,380	1,200	440	267
9	790	2,610	1,680	4,960	1,430	2,330	2,630	2,330	2,050	1,150	440	705
10	670	2,450	1,430	4,760	1,610	1,910	2,330	3,290	2,790	1,380	410	475
11	580	1,740	1,150	15,600	1,260	1,770	2,630	2,480	2,950	4,230	475	380
12	490	1,370	1,000	7,840	1,000	1,580	3,120	2,480	3,120	2,050	510	330
13	460	8,030	830	6,220	960	1,580	3,470	2,480	3,290	1,510	410	330
14	430	3,990	790	3,990	915	2,050	5,470	2,190	3,120	2,050	380	285
15	402	2,450	710	2,610	830	4,030	3,470	1,770	2,790	1,770	355	267
16	375	1,870	670	1,610	790	3,470	2,630	1,580	1,910	1,910	380	272
17	352	2,450	4,960	1,490	750	7,440	2,790	1,770	1,640	1,440	380	244
18	330	2,300	9,110	4,760	710	11,800	3,120	2,330	1,510	1,150	355	236
19	310	2,300	8,850	3,450	710	7,680	4,840	3,290	1,910	990	355	272
20	290	2,150	5,370	2,610	710	6,100	3,840	2,480	1,770	940	380	2,450
21	290	1,740	3,630	2,150	960	4,030	3,120	2,190	2,330	990	510	760
22	375	1,370	2,300	2,010	1,870	3,120	2,630	1,910	2,190	1,100	475	330
23	960	1,150	1,870	1,740	1,550	2,950	2,190	1,910	1,910	1,040	380	380
24	2,450	1,050	2,300	1,430	1,370	5,260	2,190	2,050	1,580	940	355	380
25	2,940	1,050	2,300	1,370	7,360	6,100	1,910	1,640	1,510	940	355	380
26	3,110	960	1,610	1,260	30,700	4,430	2,480	1,770	1,580	890	330	355
27	2,300	870	1,870	1,200	18,000	4,030	2,630	1,440	1,640	840	330	330
28	4,960	915	1,550	1,150	8,940	6,540	2,480	1,640	1,640	840	308	308
29	2,770	830	1,320	1,100	5,260	4,840	2,330	1,910	1,770	705	308	276
30	2,150	790	1,100	1,000	-----	5,260	2,330	2,480	1,580	620	440	258
31	1,490	-----	1,100	960	-----	5,050	-----	2,480	-----	580	355	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-foot
October	6,440	290	1,400	5.51	6.35	86,100
November	8,090	790	2,150	8.46	9.44	128,000
December	9,110	670	2,180	8.58	9.59	134,000
January	15,600	960	2,840	11.2	12.91	175,000
February	30,700	710	3,280	12.9	13.91	189,000
March	11,800	1,580	4,520	17.8	20.52	278,000
April	6,100	1,910	3,250	12.8	14.28	193,000
May	3,290	1,440	2,220	8.74	10.08	136,000
June	3,290	1,380	2,020	7.95	8.87	120,000
July	4,230	580	1,420	5.59	6.44	87,300
August	620	308	433	1.70	1.96	26,600
September	2,480	236	424	1.67	1.86	25,200
The year	30,700	236	2,170	8.54	116.51	1,580,000

## CANYON CREEK NEAR GRANITE FALLS, WASH.

LOCATION.—Staff gage in NE¼ sec. 6, T. 30 N., R. 7 E., 3 miles north of Granite Falls.

DRAINAGE AREA.—59 square miles.

RECORDS AVAILABLE.—December 1928 to September 1932 (discontinued). Comparable records September 1911 to March 1913 (gage heights only) at station about 1¼ miles upstream.

EXTREMES.—Maximum discharge during year, about 8,000 second-feet Jan. 11 (gage height, 9.20 feet); minimum, 80 second-feet Sept. 18 (gage height, 1.62 feet).

1928-32: Maximum discharge, that of Jan. 11, 1932; minimum, 37 second-feet Aug. 24 to Sept. 6, 1930 (gage height, 1.38 feet).

REMARKS.—Records fair. No diversions or regulation. Discharge interpolated Sept. 15.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	237	1,210	183	405	183	1,000	3,000	820	590	332	162	124
2	196	1,000	237	405	159	928	1,800	755	540	332	154	124
3	183	540	252	386	148	755	1,300	755	516	1,500	154	112
4	171	448	367	448	141	565	1,210	695	493	1,040	154	106
5	1,910	426	299	725	159	4,300	1,120	640	448	640	146	106
6	540	405	332	640	159	1,300	1,000	565	405	367	146	101
7	640	640	788	565	183	928	890	590	386	470	138	101
8	695	855	350	540	267	668	820	590	448	350	124	267
9	237	965	332	965	386	590	788	590	590	299	131	171
10	183	470	332	928	350	493	755	615	725	2,480	138	112
11	171	426	316	7,990	332	470	755	695	788	1,000	131	106
12	155	3,280	267	1,400	237	448	725	725	820	565	124	101
13	133	855	237	928	196	448	755	725	820	516	124	90
14	121	565	237	590	183	1,500	1,500	640	788	590	124	90
15	114	493	196	493	159	928	855	540	755	540	131	88
16	110	386	183	405	155	540	890	470	590	470	118	85
17	107	426	2,240	350	148	1,800	1,300	493	405	386	112	85
18	108	493	2,480	2,020	137	5,050	1,400	640	386	367	112	80
19	107	1,910	2,360	1,400	141	1,910	1,100	755	386	283	112	90
20	110	965	820	928	237	1,800	1,120	890	540	267	112	190
21	110	540	965	640	267	1,120	928	725	640	238	101	162
22	367	448	668	426	565	1,120	855	668	590	252	106	146
23	386	405	470	405	516	1,210	695	615	493	238	101	124
24	615	367	590	350	493	1,300	615	540	405	238	101	118
25	668	316	615	332	2,360	1,910	590	493	386	426	101	118
26	1,040	299	540	316	6,800	1,910	788	470	405	225	101	112
27	855	237	493	299	4,600	965	755	405	405	212	101	106
28	755	209	448	283	2,130	2,020	755	470	367	190	101	101
29	725	209	448	267	1,210	1,800	755	540	350	171	112	96
30	540	209	426	267	-----	2,870	788	820	332	162	118	90
31	448	-----	386	209	-----	1,300	-----	640	-----	171	112	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	1,910	107	411	6.97	8.04	25,300
November	3,280	209	667	11.3	12.61	39,700
December	2,480	183	608	10.3	11.87	37,400
January	7,990	209	849	14.4	16.60	52,200
February	6,800	137	793	13.4	14.45	45,600
March	5,050	448	1,420	24.1	27.78	87,800
April	3,000	590	1,040	17.6	19.64	61,900
May	890	405	631	10.7	12.34	38,800
June	820	332	526	8.92	9.95	31,300
July	2,480	162	494	8.37	9.65	30,400
August	162	101	123	2.08	2.40	7,560
September	267	80	117	1.98	2.21	6,960
The year	7,990	80	640	10.8	147.54	464,000

## NORTH FORK OF STILLAGUAMISH RIVER NEAR ARLINGTON, WASH.

LOCATION.—Water-stage recorder in SE¼ NW¼ sec. 16, T. 32 N., R. 6 E., 6 miles above mouth and 6 miles northeast of Arlington.

DRAINAGE AREA.—282 square miles.

RECORDS AVAILABLE.—July 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 27,700 second-feet Feb. 26 (gauge height, 12.7 feet); minimum, 229 second-feet Sept. 18 (gauge height, 2.14 feet).

1928-32: Maximum discharge, that of Feb. 26, 1932; minimum, 156 second-feet Sept. 1, 1931 (gauge height, 1.64 feet).

REMARKS.—Records excellent. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,050	2,510	755	1,500	782	4,060	6,100	2,920	2,010	1,400	682	447
2	782	3,380	1,010	1,300	755	3,260	5,130	2,700	1,840	1,300	637	435
3	640	2,040	1,300	1,160	782	2,630	4,620	2,560	1,760	3,360	615	354
4	924	1,500	1,190	1,260	782	2,530	3,640	2,560	1,800	3,410	615	324
5	3,120	1,300	1,300	1,980	782	7,910	4,610	2,430	1,580	1,880	615	317
6	1,720	2,700	1,130	2,940	865	4,940	3,540	2,310	1,440	1,440	593	313
7	1,130	4,040	2,180	1,940	1,060	3,260	3,080	2,370	1,400	1,270	593	310
8	920	3,140	2,340	1,660	1,300	2,560	2,840	2,200	1,500	1,210	572	386
9	782	3,350	1,540	3,480	1,380	2,200	2,430	2,370	1,920	1,120	550	404
10	680	2,670	1,420	3,140	1,380	1,960	2,310	2,920	2,500	3,390	529	320
11	615	1,990	1,160	12,600	1,100	1,800	2,430	2,370	2,770	2,630	521	313
12	560	2,390	1,040	5,480	1,000	1,640	3,000	2,370	2,920	1,780	492	306
13	510	7,910	948	3,210	892	1,580	3,350	2,430	2,920	1,500	459	279
14	469	4,000	838	2,480	810	3,010	3,880	2,100	2,840	1,840	431	266
15	433	3,140	782	1,990	755	3,770	3,600	1,840	2,560	1,720	431	260
16	407	2,480	810	1,710	705	2,700	3,350	1,720	1,840	1,720	439	247
17	391	2,540	4,990	1,500	680	5,350	3,840	1,800	1,610	1,440	443	241
18	371	2,240	8,130	4,820	655	9,700	3,740	2,100	1,580	1,210	415	232
19	355	3,110	10,500	4,040	640	7,350	5,700	2,310	1,640	1,060	400	729
20	363	2,740	5,540	2,860	830	6,130	4,440	2,840	1,640	1,000	423	1,010
21	367	1,890	3,680	2,240	1,310	4,170	3,170	2,310	2,630	1,000	423	544
22	1,080	2,540	2,890	1,940	1,660	3,260	2,560	2,060	2,260	1,030	427	411
23	1,970	1,340	2,300	1,620	1,300	3,170	2,260	2,150	1,920	976	404	339
24	3,000	1,190	2,670	1,420	2,120	5,040	2,100	2,010	1,640	950	388	335
25	3,640	1,190	2,600	1,420	7,290	6,220	2,060	1,800	1,580	976	388	335
26	3,070	1,060	2,140	1,260	23,400	4,210	2,430	1,640	1,580	923	388	296
27	2,540	948	2,140	1,190	22,500	3,170	2,840	1,540	1,610	823	373	276
28	3,290	892	1,840	1,100	10,500	5,940	2,700	1,640	1,610	799	361	260
29	2,480	838	1,540	1,000	5,780	4,720	2,430	1,960	1,610	752	465	250
30	1,990	782	1,380	948	-----	5,640	2,630	2,060	1,440	682	490	244
31	1,710	-----	1,380	838	-----	5,460	-----	2,060	-----	637	404	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	3,640	355	1,330	4.72	5.44	81,800
November	7,910	782	2,390	8.48	9.46	142,000
December	10,500	755	2,370	8.40	9.68	146,000
January	12,600	838	2,450	8.69	10.02	151,000
February	23,400	640	3,230	11.5	12.40	186,000
March	9,700	1,580	4,170	14.8	17.06	256,000
April	6,100	2,060	3,390	12.0	13.39	202,000
May	2,920	1,540	2,210	7.84	9.04	136,000
June	2,920	1,400	1,930	6.84	7.63	115,000
July	3,410	637	1,460	5.18	5.97	89,800
August	682	361	483	1.71	1.97	29,700
September	1,010	232	359	1.27	1.42	21,400
The year	23,400	232	2,140	7.59	103.48	1,560,000

## SKAGIT RIVER BASIN

 SKAGIT RIVER NEAR NEWHALEM, WASH.<sup>1</sup>

LOCATION.—Water-stage recorder in Whatcom County, 1¼ miles above Ruby Creek and 11 miles northeast of Newhalem.

DRAINAGE AREA.—765 square miles, of which 390 square miles is in Canada.

RECORDS AVAILABLE.—March 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 25,700 second-feet Feb. 27 (gage height, 15.9 feet); minimum, 548 second-feet Feb. 17, 18 (gage height, 3.92 feet).

1930-32: Maximum discharge, that of Feb. 27, 1932; minimum, 366 second-feet Dec. 5, 1929 (result of stream-flow measurement).

REMARKS.—Records excellent except those for Feb. 1-3, which were estimated because of ice. No regulation or diversions above station. Results of several discharge measurements furnished by city of Seattle.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,200	1,820	867	1,000	852	8,190	3,020	5,700	5,500	5,110	1,830	1,240
2	1,080	2,570	874	951	810	6,100	3,340	5,900	5,500	4,740	1,780	1,120
3	937	1,830	860	923	767	4,740	3,210	6,100	5,500	4,560	1,880	1,040
4	937	1,560	834	895	724	4,070	3,080	6,510	5,700	4,560	1,930	1,000
5	1,160	1,510	814	881	691	3,620	2,950	6,930	5,110	3,920	2,040	1,040
6	1,040	2,240	802	874	684	3,210	2,690	6,930	4,560	3,340	1,980	1,160
7	944	3,020	808	847	698	2,880	2,560	7,560	4,560	3,210	2,040	1,200
8	888	2,380	788	834	691	2,620	2,440	7,560	5,110	3,140	2,040	1,240
9	854	2,040	769	847	691	2,440	2,320	7,560	6,100	3,020	1,830	1,120
10	821	1,830	750	847	684	2,260	2,260	8,400	7,560	3,770	1,640	1,040
11	795	1,690	730	2,110	658	2,090	2,380	8,190	9,060	3,620	1,640	1,040
12	762	1,600	691	2,500	646	1,980	2,950	7,770	10,200	3,080	1,560	951
13	736	1,880	672	1,980	632	1,930	3,620	7,980	11,300	2,950	1,510	902
14	717	1,930	646	1,740	606	1,930	4,920	7,770	11,300	3,020	1,420	951
15	704	1,780	639	1,600	600	1,980	5,110	6,720	11,100	2,950	1,510	937
16	684	1,640	665	1,460	594	1,930	4,740	5,900	9,500	3,140	1,690	895
17	672	1,560	854	1,380	568	1,980	4,390	5,500	7,560	2,880	1,780	888
18	658	1,420	1,330	1,380	568	2,240	4,070	5,700	6,510	2,690	1,690	840
19	646	1,420	2,410	1,280	580	2,880	3,920	6,100	6,300	2,500	1,560	814
20	665	1,330	2,560	1,200	600	2,880	3,620	7,140	6,720	2,380	1,460	821
21	658	1,200	2,140	1,160	594	2,690	3,340	7,140	9,280	2,560	1,420	795
22	684	1,160	1,830	1,120	594	2,560	3,140	6,720	9,500	2,820	1,420	756
23	717	1,120	1,640	1,080	594	2,440	3,080	6,100	8,400	2,760	1,560	736
24	736	1,080	1,510	1,040	717	2,440	2,950	5,300	7,140	2,690	1,560	808
25	814	1,040	1,420	1,000	1,360	2,440	3,020	4,740	6,100	2,620	1,600	840
26	821	1,000	1,330	972	8,080	2,320	3,480	4,230	5,700	2,440	1,740	776
27	821	958	1,240	951	21,400	2,260	3,920	3,920	5,500	2,260	1,690	776
28	860	923	1,160	923	19,900	2,320	4,560	3,920	5,700	2,380	1,560	802
29	881	895	1,120	902	12,800	2,320	4,740	4,230	5,900	2,140	1,420	808
30	902	874	1,080	902	-----	2,320	5,300	4,560	5,500	1,980	1,280	814
31	979	-----	1,040	895	-----	2,440	-----	5,300	-----	1,880	1,160	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,200	646	831	1.09	1.26	51,100
November	3,020	874	1,580	2.07	2.31	94,000
December	2,560	639	1,120	1.46	1.68	68,900
January	2,500	834	1,180	1.54	1.78	72,600
February	21,400	568	2,740	3.58	3.86	158,000
March	8,190	1,930	2,850	3.73	4.30	175,000
April	5,300	2,260	3,500	4.58	5.11	208,000
May	8,400	3,020	6,260	8.18	9.43	385,000
June	11,300	4,560	7,120	9.31	10.39	424,000
July	5,110	1,880	3,070	4.01	4.62	189,000
August	2,040	1,160	1,650	2.16	2.49	101,000
September	1,240	736	938	1.23	1.37	55,800
The year	21,400	568	2,730	3.57	48.60	1,980,000

<sup>1</sup> Formerly published as Skagit River above Ruby Creek, near Marblemount, Wash.

SKAGIT RIVER AT NEWHALEM, WASH.<sup>1</sup>

LOCATION.—Water-stage recorder in SE¼ sec. 21, T. 37 N., R. 12 E., at city of Seattle power plant a quarter of a mile above Newhalem Creek, at Newhalem. Zero of gage is 400 feet above mean sea level.

DRAINAGE AREA.—1,160 square miles, of which 390 square miles is in Canada.

RECORDS AVAILABLE.—December 1908 to May 1914; October 1920 to September 1932.

EXTREMES.—Maximum discharge during year, 45,000 second-feet Feb. 27 (gage height, 92.84 feet); minimum, 216 second-feet Dec. 6 (gage height, 78.97 feet), result of regulation.

1908-14, 1920-32: Maximum discharge; 60,000 second-feet Dec. 12, 1921 (gage height, 94.2 feet); minimum, less than 90 second-feet, result of regulation Jan. 27, Aug. 25, 1930, when water was below intake.

REMARKS.—Records excellent. Water diverted 3 miles above station returns to river at Seattle power plant just above station. Entire low-water flow may be carried through plant. Flow partly controlled by storage and release of water at tunnel intake and above Diablo Dam. Results of one discharge measurement furnished by city of Seattle.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	2,110	1,670	1,620	1,260	1,700	13,000	5,000	9,070	6,570	8,540	3,580	1,990
2.....	2,150	1,650	1,610	1,600	1,660	9,040	5,450	9,440	9,430	8,300	3,040	2,000
3.....	2,060	1,530	1,640	1,230	1,700	7,140	5,260	9,650	9,870	8,670	2,920	1,780
4.....	1,980	1,460	1,600	1,760	1,650	6,320	4,910	10,100	9,180	8,290	4,120	1,480
5.....	2,250	1,510	1,520	1,810	1,640	6,300	4,660	10,600	8,300	6,440	4,280	2,010
6.....	2,260	1,800	1,040	1,820	1,650	5,060	4,290	10,600	7,380	5,700	4,250	2,660
7.....	2,160	1,960	1,550	1,740	1,290	4,580	4,050	11,700	7,310	6,060	4,080	2,610
8.....	2,170	1,590	1,650	1,800	1,650	5,050	3,860	11,500	8,010	5,960	4,130	2,670
9.....	2,050	1,870	1,870	1,720	1,680	4,320	3,680	11,600	9,680	5,630	3,410	2,320
10.....	1,880	1,990	1,900	1,210	1,690	3,430	3,640	13,100	12,200	5,650	2,980	2,000
11.....	1,600	1,880	1,910	2,220	1,660	3,250	3,980	12,600	14,600	7,070	2,780	1,650
12.....	1,960	2,310	1,920	1,920	1,640	2,900	5,000	12,100	17,000	5,260	2,880	2,140
13.....	1,980	3,900	1,700	1,810	1,630	1,590	6,340	12,300	19,300	5,230	2,820	2,080
14.....	1,900	3,500	2,040	1,800	1,200	3,580	8,460	12,100	18,800	5,710	2,540	2,070
15.....	1,830	2,240	2,100	1,640	1,560	3,240	8,350	10,300	18,400	5,530	2,890	2,110
16.....	1,830	2,540	2,130	1,620	1,590	3,040	7,640	8,970	15,800	5,760	3,760	2,110
17.....	1,820	2,390	2,250	1,290	1,710	3,130	7,060	8,670	12,100	5,480	4,170	2,050
18.....	1,550	2,280	2,360	1,730	1,680	4,040	6,520	9,110	10,400	4,860	3,570	1,610
19.....	1,840	2,260	2,320	1,780	2,040	4,100	6,400	9,670	9,750	4,260	3,110	2,150
20.....	1,810	2,150	1,730	1,720	2,040	3,950	5,990	11,800	11,100	4,700	2,820	2,120
21.....	1,900	1,860	1,950	1,710	1,750	4,520	5,540	11,500	16,200	5,530	2,860	2,100
22.....	1,730	1,440	1,880	1,710	1,770	4,670	5,210	10,400	16,200	6,460	2,960	2,040
23.....	1,700	1,710	1,900	1,660	2,100	3,980	4,990	9,520	13,800	5,600	3,160	2,040
24.....	1,690	1,840	1,850	1,240	2,070	3,510	4,810	8,300	11,100	4,120	3,270	1,960
25.....	1,540	1,830	1,420	1,730	2,950	2,830	4,990	7,320	10,000	5,150	3,580	1,570
26.....	1,690	1,340	1,610	1,750	8,510	3,010	5,820	6,520	8,980	5,090	3,650	2,020
27.....	1,770	1,640	1,380	1,670	81,900	3,510	6,530	6,210	8,070	4,910	3,610	2,060
28.....	1,900	1,630	1,750	1,690	32,100	3,780	7,170	6,150	9,170	4,720	3,140	2,050
29.....	1,760	1,280	1,740	1,640	19,500	3,750	7,550	6,790	9,990	4,240	2,750	2,060
30.....	1,670	1,490	1,780	1,670	8,780	8,250	7,230	9,360	9,360	3,880	2,490	2,030
31.....	1,620	-----	1,790	1,250	-----	3,930	-----	6,100	-----	3,700	2,220	-----

<sup>1</sup> Formerly published as Skagit River near Marblemount, Wash.

Discharge, in second-feet, of Skagit River at Newhalem, Wash., 1931-32—Contd.

Month	Observed				Gain or loss in storage of Diablo Reservoir (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre-feet		Run-off in acre-feet	Discharge in second-feet		Run-off in inches
	Maximum	Minimum	Mean				Mean	Per square mile	
October-----	2,260	1,540	1,870	115,000	-34,600	80,400	1,310	1.13	1.30
November-----	3,900	1,280	1,950	116,000	+36,000	152,000	2,550	2.20	2.46
December-----	2,360	1,040	1,790	110,000	-6,980	103,000	1,680	1.45	1.67
January-----	2,220	1,210	1,650	101,000	+3,030	104,000	1,690	1.46	1.68
February-----	32,100	1,200	4,680	269,000	+330	269,000	4,680	4.03	4.35
March-----	13,000	1,590	4,460	274,000	-4,310	270,000	4,390	3.78	4.46
April-----	8,460	3,640	5,710	340,000	+1,540	342,000	5,750	4.96	5.53
May-----	13,100	6,100	9,710	597,000	+1,510	599,000	9,740	8.40	9.68
June-----	19,300	6,570	11,600	690,000	+9,650	700,000	11,800	10.2	11.38
July-----	8,670	3,380	5,680	349,000	-2,440	347,000	5,640	4.86	5.60
August-----	4,280	2,220	3,280	202,000	+3,010	205,000	3,330	2.87	3.31
September-----	2,670	1,480	2,050	122,000	-18,600	103,000	1,730	1.49	1.66
The year-----	32,100	1,040	4,530	3,280,000	-11,900	3,270,000	4,510	3.89	52.98

# SKAGIT RIVER NEAR CONCRETE, WASH.

**LOCATION.**—Water-stage recorder in sec. 16, T. 35 N., R. 8 E., at dam 2 miles below Baker River and 2½ miles southwest of Concrete. Zero of gage is 163 feet above mean sea level.

**DRAINAGE AREA.**—2,700 square miles, of which 390 square miles is in Canada.

**RECORDS AVAILABLE.**—September 1924 to September 1932.

**EXTREMES.**—Maximum discharge during year, 147,000 second-feet Feb. 27 (gage height, 27.30 feet); minimum, 4,070 second-feet Oct. 20 (gage height, 1.41 feet).

1924-32: Maximum discharge, that of Feb. 27, 1932; minimum, probably less than 2,160 second-feet during period Oct. 1-24, 1925, when recorder was not operating and when gates in Baker River Dam were closed for first time.

High-water marks at gage height 56.6 feet indicate a flood of 500,000 second-feet about 1815. Records of other floods prior to establishment of station are given in Water-Supply Paper 612.

**REMARKS.**—Records excellent except those for Oct. 26 to Nov. 10, Nov. 19 to Dec. 10, Feb. 17-24, which were estimated. Water diverted for operation of power plants upstream is returned to river above station. At low stages flow partly controlled by storage and release of water at power plants on Baker River and on upper Skagit River.

*Discharge, in second-feet, of Skagit River near Concrete, Wash., 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9,100	14,500	6,700	7,760	6,420	40,400	21,400	24,300	19,700	28,400	12,900	8,420
2	8,170			7,340	6,600	31,700	22,400	28,200	23,600	26,900	11,900	8,080
3	7,500			7,190	6,640	24,100	19,700	28,700	23,600	28,800	11,500	7,180
4	7,260			7,240	6,560	20,700	19,200	28,700	23,500	35,500	13,600	6,380
5	11,800	11,500	6,600	7,450	6,590	23,700	18,300	30,200	21,600	25,300	14,500	6,800
6	10,000			8,140	6,460	21,900	15,900	30,700	20,000	20,100	14,200	8,200
7	8,580			7,400	5,970	18,400	14,100	29,200	19,000	18,800	14,100	8,640
8	7,880			7,600	6,370	16,500	13,200	29,700	19,700	19,600	13,700	9,160
9	7,600	16,000	7,700	8,330	6,740	15,500	12,400	28,200	24,200	19,000	12,000	8,740
10	7,180			7,810	6,920	12,900	11,500	32,200	32,200	27,200	10,800	7,750
11	6,720			19,100	6,670	12,300	12,800	30,700	39,600	28,200	10,300	7,200
12	6,540			17,300	6,400	11,200	15,300	29,200	44,600	20,000	10,100	7,120
13	6,630	18,400	6,760	12,300	6,090	9,700	21,200	30,700	48,600	19,100	9,520	7,160
14	6,380			10,600	5,530	10,900	27,800	29,700	35,400	20,900	12,000	6,910
15	5,490			9,640	5,820	12,900	28,200	25,200	49,000	21,500	9,660	7,680
16	5,450			8,640	5,880	11,800	23,100	23,100	38,600	22,100	11,600	7,420
17	5,540	10,300	18,400	7,130	5,800	13,800	21,100	22,300	32,500	20,000	12,600	7,430
18	5,050			9,910	5,800	22,200	21,100	23,900	28,600	17,800	11,600	6,670
19	4,730			11,300	6,100	27,800	23,200	24,800	27,700	15,600	10,300	6,910
20	4,680			9,810	6,200	23,700	20,500	29,200	30,500	14,500	9,560	7,970
21	4,730	8,900	14,800	9,000	6,200	20,700	17,000	28,200	47,900	17,000	9,080	7,280
22	5,350			8,470	6,000	18,400	16,200	25,800	49,100	21,000	9,560	7,040
23	6,310			7,740	6,400	16,700	15,800	25,000	43,200	19,800	9,780	6,850
24	7,630			6,460	7,500	16,900	14,000	22,700	35,500	17,400	10,000	7,060
25	8,390	7,400	9,950	7,190	14,100	19,500	14,800	20,400	31,000	17,700	10,600	7,080
26	8,700			9,340	7,200	69,400	16,900	16,300	18,000	30,000	16,700	10,800
27	8,800			8,770	7,120	129,000	14,200	19,800	16,700	29,300	15,800	10,500
28	10,000			8,820	6,930	105,000	18,600	21,200	16,300	30,500	15,800	9,700
29	9,000	6,600	8,750	6,790	59,300	18,600	21,300	18,300	32,500	14,500	9,300	7,220
30	9,400			8,440	6,920	18,000	22,800	20,300	31,000	12,500	8,680	7,280
31	9,900			8,250	5,760	19,100	-----	21,500	-----	12,200	8,100	-----

Month	Observed				Gain or loss in storage in Diablo and Lake Shannon Reservoirs (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre-feet		Run-off in acre-feet	Discharge in second-feet		Run-off in inches
	Maximum	Minimum	Mean				Mean	Per square mile	
October	11,800	4,680	7,460	459,000	-8,990	450,000	7,320	2.71	3.12
November			11,100	660,000	+59,000	719,000	12,100	4.48	5.00
December	23,800		9,650	593,000	+10,100	603,000	9,810	3.63	4.18
January	19,100	5,760	8,770	539,000	-3,260	536,000	8,720	3.23	3.72
February	129,000	5,530	18,200	1,050,000	-2,500	1,050,000	18,300	6.78	7.31
March	40,400	9,700	18,700	1,150,000	-4,020	1,150,000	18,700	6.93	7.99
April	28,200	11,500	18,700	1,110,000	+10,000	1,120,000	18,800	6.96	7.76
May	32,200	16,300	25,600	1,570,000	-4,180	1,570,000	25,500	9.44	10.88
June	50,400	19,000	32,600	1,940,000	+1,490	1,940,000	32,600	12.1	13.50
July	35,500	12,200	20,300	1,250,000	+11,900	1,260,000	20,500	7.59	8.75
August	14,500	8,100	11,000	676,000	-1,130	675,000	11,000	4.07	4.69
September	9,160	6,380	7,440	443,000	-46,000	397,000	6,670	2.47	2.76
The year	129,000	4,680	15,800	11,400,000	+22,400	11,500,000	15,800	5.85	79.66

RUBY CREEK NEAR NEWHALEM, WASH.<sup>3</sup>

LOCATION.—Water-stage recorder in Whatcom County, 1 mile above mouth and 10½ miles northeast of Newhalem.

DRAINAGE AREA.—210 square miles.

RECORDS AVAILABLE.—June 1919 to March 1920; April 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 6,730 second-feet Feb. 27 (gage height, 14.15 feet); minimum, not determined, occurred in January or February during period of ice effect.

1919-20, 1930-32: Maximum discharge, that of Feb. 27, 1932; minimum discharge occurred in December 1930 or January 1931 during period of ice effect.

REMARKS.—Records fair except those estimated because of ice, Nov. 22 to Dec. 4, Dec. 13-16, Jan. 14 to Feb. 14, which are poor. No diversions or regulation. Results of some discharge measurements furnished by city of Seattle.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	167	291	150	151	100	1,500	600	1,660	1,660	1,460	412	254
2	156	402		144		1,170	620	1,710	1,660	1,320	412	226
3	145	291		148		965	580	1,710	1,710	1,360	443	201
4	157	258		145		840	542	1,800	1,850	1,220	459	197
5	211	258		150		760	508	1,960	1,540	965	476	222
6	182	418	157	146	110	680	476	2,060	1,390	840	459	248
7	167	550	160	145		620	443	2,360	1,540	840	459	246
8	159	399	157	145		560	427	2,180	1,850	820	443	259
9	156	342	154	156		525	427	2,360	2,420	800	381	210
10	150	307	152	156		492	443	2,730	2,990	1,190	340	201
11	144	278	146	503	120	476	560	2,420	3,410	915	337	195
12	141	270	136	352		443	800	2,420	3,700	720	312	171
13	138	342	200	256		427	1,130	2,600	3,700	720	293	165
14	136	315		140		443	1,540	2,420	3,550	740	293	184
15	134	278			139	427	1,290	1,960	3,410	720	323	173
16	131	256	145	114	114	427	1,140	1,710	2,660	740	384	167
17	128	246		111	111	443	1,020	1,760	2,060	720	396	163
18	127	229		114	114	525	915	1,900	1,850	660	360	150
19	125	232		110	110	600	865	2,120	1,850	580	317	159
20	127	215		125	102	560	780	2,660	2,120	580	304	161
21	124	166		256	114	508	740	2,480	2,990	700	304	146
22	129	140		225	117	492	700	2,120	2,730	760	320	139
23	138		204	118	459	680	1,850	2,360	720	337	132	
24	134		197	168	476	660	1,580	1,960	700	334	150	
25	141		187	120	380	443	720	1,360	1,760	660	351	144
26	138		178	110	3,290	427	890	1,200	1,660	560	381	133
27	135		172		6,090	412	1,040	1,120	1,660	560	352	133
28	142		167		3,670	427	1,200	1,120	1,760	580	306	139
29	150	159	150	2,120	427	1,290	1,260	1,760	508	285	141	
30	150	154		154	427	1,460	1,360	1,540	443	259	139	
31	160	154			443	1,540	1,540	1,540	427	224	139	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	211	124	146	0.695	0.80	8,980
November	550		254	1.21	1.35	15,100
December			194	.924	1.07	11,900
January	503		155	.738	.85	9,530
February	6,090		631	3.00	3.24	36,300
March	1,500	412	575	2.74	3.16	35,400
April	1,540	427	816	3.89	4.34	48,600
May	2,730	1,120	1,920	9.14	10.54	118,000
June	3,700	1,390	2,240	10.7	11.94	133,000
July	1,460	427	791	3.77	4.35	48,600
August	476	224	357	1.70	1.96	22,000
September	259	132	178	.848	.95	10,600
The year	6,090		686	3.27	44.55	498,000

<sup>3</sup> Formerly published as Ruby Creek near Marblemount, Wash.



THUNDER CREEK NEAR NEWHALEM, WASH.<sup>1</sup>

LOCATION.—Water-stage recorder in SE¼ sec. 23, T. 37 N., R. 13 E. (unsurveyed), half a mile above backwater from Diablo Reservoir and 8 miles east of Newhalem.

DRAINAGE AREA.—98 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 8,780 second-feet Feb. 26 (gage height, 11.3 feet); minimum, 74 second-feet Feb. 23 (gage height, 1.61 feet).

1930-32: Maximum discharge, that of Feb. 26, 1932; minimum probably occurred during period Dec. 20, 1930, to Jan. 10, 1931.

REMARKS.—Records good except those for November to March and September. Discharge estimated Jan. 13-16, Mar. 4-15, Sept. 20-23, 30. No diversions or regulation. Results of many discharge measurements furnished by city of Seattle.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	477	637	138	169	102	1,240	384	800	840	1,600	840	600
2	431	597	134	159	102	1,060	432	820	860	1,390	905	402
3	265	320	133	134	102	972	439	820	882	1,980	1,020	362
4	322	284	133	139	103		422	820	905	1,560	1,140	485
5	446	356	132	133	102		406	840	780	1,040	1,200	660
6	277	605	129	126	98		380	840	740	928	1,180	780
7	233	626	129	118	95		359	950	760	928	1,300	680
8	212	444	125	116	94		345	882	860	950	1,120	640
9	206	382	122	120	92		331	905	1,090	950	882	374
10	198	336	122	117	91	450	326	1,090	1,500	1,590	760	467
11	191	302	120	448	90		384	972	1,880	1,060	740	371
12	182	286	112	345	88		485	972	2,300	860	680	267
13	175	367	112	321	87		660	1,060	2,650	995	660	309
14	174	326	110	297	86		882	950	3,770	1,040	740	485
15	179	296	109	273	85		840	800	2,350	1,020	928	374
16	184	269	109	249	85	260	800	760	1,560	1,200	1,260	387
17	186	255	170	225	80	267	780	780	1,180	1,090	1,300	317
18	175	242	274	209	79	315	760	820	1,060	928	1,090	197
19	168	236	397	195	79	374	740	882	1,090	820	905	188
20	187	223	444	186	78	393	720	1,120	1,840	928	840	
21	156	199	394	180	76	380	700	972	3,900	1,240	800	170
22	145	193	334	171	75	365	660	882	2,980	1,390	840	
23	148	182	299	159	74	348	640	800	2,110	1,320	928	
24	141	173	272	148	88	351	620	740	1,640	1,300	1,060	362
25	146	166	253	139	233	348	620	700	1,460	1,260	1,140	294
26	146	157	240	132	4,380	345	660	660	1,360	1,060	1,090	264
27	143	145	225	126	7,720	334	700	640	1,460	1,140	1,060	331
28	167	142	213	122	3,590	336	740	640	1,600	1,260	928	396
29	174	139	203	116	1,770	331	740	680	1,760	972	660	377
30	172	139	191	110		331	760	720	1,530	840	541	350
31	216		180	103		342		780		840	442	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	477	141	214	2.18	2.51	13,200
November	637	139	301	3.07	3.42	17,900
December	444	109	195	1.99	2.29	12,000
January	448	103	180	1.84	2.12	11,100
February	7,720	74	684	6.98	7.53	39,300
March	1,240		455	4.64	5.35	28,000
April	882	326	590	6.02	6.72	35,100
May	1,120	640	842	8.59	9.90	51,800
June	3,900	740	1,620	16.5	18.41	96,400
July	1,980	820	1,140	11.6	13.37	70,100
August	1,300	442	935	9.54	11.00	57,500
September	780		380	3.88	4.33	22,600
The year	7,720	74	627	6.40	86.95	455,000

<sup>1</sup> Formerly published as Thunder Creek above Colonial Creek, near Marblemount, Wash.

## CASCADE RIVER AT MARBLEMOUNT, WASH.

LOCATION.—Water-stage recorder in SW¼ sec. 9, T. 35 N., R. 11 E., 2 miles east of Marblemount.

DRAINAGE AREA.—180 square miles.

RECORDS AVAILABLE.—September 1928 to September 1932.

EXTREMES.—Maximum discharge during year ending Sept. 30, 1929, 10,700 second-feet Oct. 9 (gage height, 9.20 feet); minimum, not determined, probably occurred during January or February when water-stage recorder was not operating.

Maximum discharge during year ending Sept. 30, 1930, 2,740 second-feet June 7 (gage height, 5.43 feet); minimum, 149 second-feet Nov. 15 (gage height, 1.38 feet).

Maximum discharge during year ending Sept. 30, 1931, 4,480 second-feet Jan. 27 (gage height, 6.55 feet); minimum, 237 second-feet Oct. 16.

Maximum discharge during year ending Sept. 30, 1932, 12,900 second-feet Feb. 26 (gage height, 9.88 feet); minimum, 277 second-feet Feb. 18, 19.

REMARKS.—Records good except those estimated, which are fair. No diversions or regulation.

## Discharge, in second-feet, 1928-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1.....	590	301	295	244	140	157	448	820	1,490	1,740	960	517
2.....	792	283	278	253		183	405	1,310	1,310	1,840	902	508
3.....	570	280	262	244		193	369	1,450	1,110	1,660	902	448
4.....	488	328	255	233		201	342	1,170	1,450	1,570	848	407
5.....	479	314	244	226		233	310	1,080	1,990	1,490	755	397
6.....	710	295	244	220	140	229	286	1,020	2,490	1,530	738	394
7.....	848	278	262	215		215	283	1,050	2,210	1,450	732	363
8.....	2,490	295	328	218		207	268	1,080	2,260	1,490	830	345
9.....	8,310	640	590	211		211	255	1,050	2,320	1,570	830	357
10.....	1,840	710	685	211		242	244	1,050	2,160	1,530	820	378
11.....	1,140	660	560	211	150	242	244	1,310	1,940	1,280	732	420
12.....	820	630	474	211		224	235	1,740	1,840	1,080	735	
13.....	710	635	409	215		215	237	1,990	2,550	1,140	710	
14.....	685	528	373	215		215	373	1,790	2,930	1,340	675	
15.....	1,050	470	345	213		224	448	1,700	3,220	1,310	675	
16.....	1,240	443	317	209	200	237	448	1,740	2,800	1,200	625	441
17.....	1,490	397	298	207		242	393	1,530	2,100	1,170		479
18.....	930	369	286	200	144	244	381	1,610	1,740	1,240	600	437
19.....	738	349	278		148	255	385	1,940	1,740	1,200		400
20.....	625	373	268		153	314	438	2,320	1,490	1,080		366
21.....	560	479	260	190	151	421	524	2,550	1,380	930	575	339
22.....	650	502	255		149	393	580	2,860	1,450	875	575	313
23.....	660	452	251		151	353	685	2,740	1,700	848	820	291
24.....	510	413	244		149	320	738	2,740	1,940	902	710	265
25.....	434	389	260		153	304	848	1,990	2,160	848	600	233
26.....	434	377	258	140	151	342	1,020	1,530	1,940	902	590	222
27.....	397	342	251		148	461	1,140	1,280	1,740	848	548	215
28.....	373	324	244		146	848	1,050	1,140	1,840	820	600	211
29.....	349	310	265			710	1,020	1,140	1,840	902	576	209
30.....	349	307	255			585	875	1,240	1,740	990	553	207
31.....	328		244			497		1,490		1,020	526	

*Discharge, in second-feet, of Cascade River at Marblemount, Wash.,  
1928-32—Continued*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1929-30												
1.....	211	199	171	365	508	470	1,110	990	1,310	1,570	875	456
2.....	211	209	166	338	685	430	1,080	1,170	1,420	1,420	765	554
3.....	289	193	160	357	595	405	1,050	1,140	1,240	1,280	738	596
4.....	728	187	158	345	1,140	385	990	1,020	1,140	1,280	848	579
5.....	652	179	181	317	2,010	385	1,080	960	1,310	1,490	930	592
6.....	329	175	195	280	1,240	349	1,110	930	1,900	1,490	902	578
7.....	272	171	177	255	1,050	338	1,630	820	2,320	1,380	902	476
8.....	270	171	181		1,020	328	2,000	765	1,990	1,420	960	699
9.....	337	173	171		875	314	1,420	765	1,890	1,600	930	542
10.....	293	167	175		848	307	1,170	848	2,210	1,940	930	494
11.....	255	158	166	190	820	350	1,050	1,020	2,040	1,890	990	474
12.....	288	155	158		710	389	1,050	1,140	1,610	1,940	926	502
13.....	265	153	173		570	353	1,280	1,450	1,340	2,100	902	672
14.....	268	151	718		492	320	1,420	1,740	1,140	1,790	902	1,080
15.....		149	596		560	307	1,380	2,040	1,310	1,450	902	774
16.....	350	174	425		850	292	1,200	2,100	1,750	1,280	792	586
17.....		271	338		1,380	292	1,080	1,570	1,710	1,050	655	526
18.....		209	280	160	1,610	310	1,050	1,280	1,110	1,020	650	690
19.....	348	187	260	160	1,890	349	1,050	1,140	1,310	1,170	660	477
20.....	288	173	242		1,700	334	1,170	1,380	1,530	1,140	565	448
21.....	288	167	242		1,380	446	1,520	1,170	2,160	1,240	536	449
22.....	275	167	312		1,110	538	2,040	990	1,610	1,310	590	356
23.....	272	164	515		960	479	1,840	960	1,660	1,340	557	280
24.....	265	162	490		820	792	1,660	960	1,570	1,240	533	265
25.....	246	167	930		710	1,340	1,530	875	1,450	990	484	242
26.....	280	169	685	180	620	1,200	1,490	792	1,420	875	449	807
27.....	285	169	538		560	1,240	1,380	848	1,740	820	502	824
28.....	248	167	425		510	1,570	1,280	1,110	1,700	848	541	748
29.....	229	171	381			1,740	1,110	1,170	1,420	960	559	452
30.....	213	179	393			1,380	1,020	1,310	1,490	1,050	513	357
31.....	203		385	207		1,200		1,530		960	443	
1930-31												
1.....	327	625	399	282	1,170	500	960	2,430	2,260	1,200	902	472
2.....	324	549	488	288	990	615	820	2,670	1,820	1,140	875	868
3.....	328	503	439	293	875	820	738	2,380	1,530	1,170	821	573
4.....	315	473	413	322	792	738	710	1,790	1,610	700	968	
5.....	287	444	394	338	738	630	738	1,740	1,720	586	2,100	
6.....	735	427	377	328	660	571	820	2,160	2,130	510	1,340	
7.....	1,420	408	361	312	600	530	1,200	1,730	2,320	1,350	453	980
8.....	883	405	350	302	545	513	1,050	1,280	2,320	483	645	
9.....	546	450	350	308	513	503	898	1,080	2,270	564	542	
10.....	413	518	350	315	494	557	820	1,050	1,820	582	506	
11.....	338	820	353	380	467	542	738	1,390	1,530	495	690	
12.....	298	630	355	380	447	586	685	2,040	1,430	1,240	444	996
13.....	268	538	383	369	430	549	630	2,550		1,080	421	1,540
14.....	278	479	361	369	413	513	600	2,490		1,080	478	1,060
15.....	260	461	358	358	408	513	553	2,100	1,800	1,110	507	875
16.....	244	453	372	345	402	530	534	2,040		1,140	499	655
17.....	709	450	366	340	411	522	557	1,700		1,170	482	557
18.....	1,170	425	355	328	1,230	625	519	1,420	1,740	1,050	561	660
19.....	837	411	353	322	1,120	765	494	1,170	1,570	1,110	522	710
20.....	635	430	342	315	820	960	482	1,050	1,380	1,210	501	685
21.....	506	447	332	310	710	1,450	503	1,020	1,380	1,140	529	561
22.....	430	447	332	715	630	1,200	538	990	1,380	960	495	485
23.....	401	447	330	3,140	576	960	557	1,020	1,340	960	512	455
24.....	685	441	322	1,700	530	848	665	1,240	1,340	933	521	439
25.....	660	444	318	1,200	506	765	792	1,570	1,460	875	489	441
26.....	1,780	461	305	1,140	485	685	875	1,610	3,370	848	654	447
27.....	1,730	455	302	2,310	470	630	1,190	1,530	2,320	792	493	444
28.....	990	433	298	3,370	458	586	1,990	1,450	1,610	765	541	427
29.....	765	411	293	2,380		549	2,020	1,780	1,490	792	572	462
30.....	660	399	288	1,790		542	2,260	2,160	1,380	853	556	797
31.....	765		286	1,420		820		2,430		875	473	

NOTE.—Records for October 1928 to September 1931 published here supersede those published in Water-Supply Papers 692, 707, and 722.

*Discharge, in second-feet, of Cascade River at Marblemount, Wash.,  
1928-32—Continued*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1.....	549	1,450	394	436	342	1,880	1,420	1,720	1,680	2,110	1,050	816
2.....	545	1,480	405	416	340	1,500	1,420	1,800	1,640	1,930	1,020	610
3.....	436	930	399	405	340	1,250	1,280	1,720	1,560	2,680	1,120	534
4.....	538	792	391	399	338	1,120	1,150	1,720	1,640	2,490	1,220	548
5.....	1,020	848	385	405	335	1,150	1,050	1,680	1,390	1,800	1,280	615
6.....	685	1,450	380	411	335	1,020	958	1,600	1,220	1,500	1,220	690
7.....	542	1,660	385	397	335	875	902	1,840	1,250	1,500	1,250	715
8.....	482	1,140	383	394	332	794	820	1,680	1,390	1,530	1,150	848
9.....	453	990	377	467	332	741	794	1,840	2,070	1,530	930	577
10.....	430	848	372	473	332	690	794	2,260	2,670	2,300	848	601
11.....	408	738	358	1,430	320	640	930	1,930	3,000	1,680	920	581
12.....	385	710	350	1,100	315	596	1,250	1,980	3,520	1,360	848	455
13.....	372	1,150	345	792	308	586	1,560	2,060	3,600	1,500	774	430
14.....	361	1,080	332	660	298	664	2,110	1,840	3,520	1,560	820	525
15.....	358	902	328	595	293	715	1,720	1,530	3,140	1,560	958	511
16.....	358	792	338	538	288	690	1,530	1,390	2,160	1,680	1,150	488
17.....	350	738	922	503	286	850	1,420	1,500	1,880	1,530	1,120	488
18.....	340	650	1,340	635	279	1,420	1,320	1,720	1,890	1,320	930	390
19.....	332	645	1,760	600	279	1,720	1,390	1,860	1,840	1,150	848	418
20.....	358	590	1,480	534	284	1,500	1,250	2,320	2,400	1,220	848	426
21.....	332	530	1,080	503	286	1,250	1,080	1,930	3,760	1,540	820	378
22.....	377	510	875	479	288	1,080	1,020	1,720	3,000	1,680	737	351
23.....	397	488	765	455	291	985	930	1,560	2,550	1,600	890	337
24.....	413	473	710	441	390	1,050	902	1,360	2,210	1,530	875	440
25.....	453	464	645	433	1,030	1,150	958	1,180	2,110	1,530	912	390
26.....	485	444	586	419	8,300	985	1,220	1,050	2,160	1,320	912	351
27.....	482	425	549	413	9,250	902	1,360	1,020	2,260	1,360	875	382
28.....	600	413	513	399	4,530	1,050	1,360	1,080	2,380	1,390	848	426
29.....	660	405	482	383	2,490	1,020	1,320	1,360	2,490	1,150	741	422
30.....	660	397	464	372	-----	1,080	1,500	1,530	2,210	985	670	414
31.....	792	-----	450	358	-----	1,180	-----	1,640	-----	1,020	575	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	A cre-feet
1928-29						
October.....	8,310	328	1,020	5.67	6.54	62,700
November.....	710	278	416	2.31	2.58	24,800
December.....	685	244	317	1.76	2.03	19,500
January.....	253	-----	201	1.12	1.29	12,400
February.....	-----	-----	146	0.811	.84	8,110
March.....	848	157	313	1.74	2.01	19,200
April.....	1,140	235	509	2.83	3.16	30,200
May.....	2,860	820	1,600	8.89	10.25	98,400
June.....	3,220	1,110	1,960	10.9	12.16	117,000
July.....	1,840	820	1,220	6.78	7.82	75,000
August.....	960	526	699	3.88	4.47	43,000
September.....	517	207	361	2.01	2.24	21,500
The year.....	8,310	-----	734	4.08	55.39	532,000
1929-30						
October.....	728	203	307	1.71	1.97	18,900
November.....	271	149	176	.978	1.09	10,500
December.....	930	158	335	1.86	2.14	20,600
January.....	365	-----	210	1.17	1.35	12,900
February.....	2,010	492	972	5.40	5.62	54,000
March.....	1,740	292	611	3.39	3.91	37,600
April.....	2,040	990	1,310	7.28	8.12	78,000
May.....	2,100	765	1,160	6.44	7.42	71,300
June.....	2,320	1,110	1,580	8.78	9.80	94,000
July.....	2,100	820	1,330	7.39	8.52	81,800
August.....	990	443	724	4.02	4.64	44,500
September.....	1,080	242	552	3.07	3.42	32,800
The year.....	2,320	-----	769	4.27	58.00	557,000

*Discharge, in second-feet, of Cascade River at Marblemount, Wash.,  
1928-32—Continued*

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1930-31						
October.....	1,780	244	645	3.58	4.13	39,700
November.....	820	399	476	2.64	2.94	28,300
December.....	488	286	352	1.96	2.26	21,600
January.....	3,370	282	841	4.67	5.38	51,700
February.....	1,230	402	639	3.55	3.70	35,500
March.....	1,450	500	681	3.78	4.36	41,900
April.....	2,260	482	851	4.73	5.28	50,600
May.....	2,670	990	1,710	9.50	10.95	105,000
June.....	3,370	1,340	1,790	9.94	11.09	107,000
July.....	-----	765	1,110	6.17	7.11	68,200
August.....	902	421	556	3.09	3.56	34,200
September.....	2,100	427	746	4.14	4.62	44,400
The year.....	3,370	244	867	4.82	65.38	628,060
1931-32						
October.....	1,020	332	482	2.68	3.09	29,600
November.....	1,660	397	804	4.47	4.99	47,800
December.....	1,760	328	598	3.32	3.83	36,800
January.....	1,430	358	524	2.91	3.36	32,200
February.....	9,250	279	1,140	6.33	6.83	65,600
March.....	1,880	586	1,040	5.78	6.66	64,000
April.....	2,110	794	1,220	6.78	7.56	72,600
May.....	2,320	1,020	1,660	9.22	10.63	102,000
June.....	3,760	1,220	2,290	12.7	14.17	136,000
July.....	2,680	985	1,580	8.78	10.12	97,200
August.....	1,280	586	941	5.23	6.03	57,900
September.....	848	337	505	2.81	3.14	30,000
The year.....	9,250	279	1,060	5.89	80.41	772,000

SAUK RIVER ABOVE WHITECHUCK RIVER, NEAR DARRINGTON, WASH.

LOCATION.—Water-stage recorder in NW¼ sec. 24, T. 31 N., R. 10 E., half a mile above Whitechuck River and 9½ miles southeast of Darrington.

DRAINAGE AREA.—152 square miles.

RECORDS AVAILABLE.—August to November 1910 (fragmentary gage heights); October 1917 to September 1922; August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 20,000 second-feet Feb. 26 (gage height, 13.0 feet); minimum, 190 second-feet Feb. 18 (gage height, 2.20 feet).

1917-22, 1928-32: Maximum discharge, 23,000 second-feet Dec. 12, 1921 (gage height, 14.65 feet); minimum, 146 second-feet Sept. 25, 1930.

REMARKS.—Records good except those for Oct. 1 to Nov. 15, May 6-11, which were estimated. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	650	1,550	320	404	320	2,440	1,730	2,220	1,930	2,140	815	449	
2			335	366	320	1,860	1,730	2,140	1,860	2,900	783	400	
3			330	345	288	1,560	1,610	2,070	1,860	2,610	815	310	
4			325	335	283	1,440	1,440	2,000	2,000	2,750	863	265	
5			315	366	274	2,220	1,390	2,000	1,730	1,860	903	284	
6			306	415	270	1,730	1,240	2,400	1,560	1,500	887	330	
7			350	366	278	1,390	1,160		1,500	1,440	863	351	
8			350	366	296	1,180	1,090		1,610	1,500	831	582	
9			325	574	320	1,060	1,020		2,220	1,440	719	470	
10			320	543	315	969	1,010		3,070	2,500	642	358	
11	400	1,450	296	2,680	278	903	1,120	3,480	2,000	620	330		
12			278	1,750	261	855	1,390	2,440	3,910	1,500	605	278	
13			265	1,140	245	823	1,800	2,590	4,090	1,440	522	239	
14			257	899	233	879	2,290	2,360	4,000	1,440	500	239	
15			253	737	222	927	1,930	2,000	3,820	1,440	552	232	
16	350	1,020	268	638	214	903	1,730	1,800	2,750	1,560	628	206	
17			998	1,040	582	208	1,240	1,730	1,860	2,290	1,390	620	226
18			854	1,940	1,100	204	2,520	1,800	2,070	2,140	1,200	552	200
19			980	2,540	1,050	204	2,990	2,070	2,220	2,000	1,060	515	316
20			872	2,080	827	225	2,070	1,800	2,670	2,290	1,070	508	582
21			694	1,410	710	278	1,610	1,500	2,360	2,910	1,240	478	372
22			598	1,090	622	296	1,390	1,340	2,140	2,990	1,340	508	298
23			529	908	550	278	1,290	1,240	2,070	2,750	1,290	470	246
24			487	845	501	450	1,560	1,190	1,860	2,360	1,240	500	265
25			474	755	474	2,370	1,730	1,240	1,610	2,290	1,200	545	252
26	950		428	662	441	14,600	1,390	1,440	2,290	1,060	552	206	
27			388	598	428	11,700	1,240	1,670	1,340	2,360	1,000	522	194
28			360	529	388	6,390	1,560	1,730	1,390	2,440	1,060	500	194
29			345	480	360	3,560	1,440	1,670	1,610	2,590	919	449	200
30			330	434	345	-----	1,390	1,860	1,800	2,290	815	421	200
31			-----	410	320	-----	1,390	-----	1,860	-----	791	337	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	-----	-----	585	3.85	4.44	36,000
November	-----	330	1,060	6.97	7.78	63,100
December	2,540	253	665	4.38	5.05	40,900
January	2,680	320	665	4.38	5.05	40,900
February	14,600	204	1,560	10.3	11.11	89,700
March	2,990	823	1,480	9.74	11.23	91,000
April	2,290	1,010	1,530	10.1	11.27	91,000
May	-----	1,340	2,070	13.6	15.68	127,000
June	4,090	1,500	2,510	16.5	18.41	149,000
July	2,750	791	1,480	9.74	11.23	91,000
August	903	337	614	4.04	4.66	37,800
September	582	194	302	1.99	2.22	18,000
The year	14,600	194	1,210	7.96	108.13	875,000

## SAUK RIVER AT DARRINGTON, WASH.

LOCATION.—Staff gage in SW $\frac{1}{4}$  sec. 24, T. 32 N., R. 9 E., half a mile southeast of Darrington.

DRAINAGE AREA.—293 square miles.

RECORDS AVAILABLE.—June 1914 to October 1926; June 1928 to September 1932 (discontinued).

EXTREMES.—Maximum discharge during year, 36,000 second-feet Feb. 26 (gage height, 16.0 feet); minimum, 450 second-feet Oct. 18, 19, 21 (gage height, 1.89 feet).

1914-26, 1928-32: Maximum discharge, 36,000 second-feet Dec. 29, 1917, Dec. 12, 1921, Feb. 26, 1932; minimum, 262 second-feet Sept. 25, 1930; discharge may have been less during period of ice effect, Jan. 11-25, 1930.

REMARKS—Records good. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,040	3,560	1,270	1,050	720	3,970	2,550	3,380	3,030	3,770	1,560	1,000
2.....	910	3,560	1,770	840	680	3,030	2,550	3,570	2,860	3,770	1,450	760
3.....	740	2,120	910	880	720	2,550	3,030	3,380	3,200	6,700	1,450	640
4.....	2,000	1,770	910	800	640	2,280	3,200	2,860	3,200	5,270	1,670	760
5.....	2,370	1,660	825	880	720	5,050	3,200	2,550	2,550	3,200	1,670	760
6.....	1,660	4,830	910	840	800	3,200	2,410	3,200	2,410	2,860	1,560	640
7.....	1,140	3,360	1,090	840	800	2,280	1,900	3,570	2,410	2,860	1,780	720
8.....	955	2,820	910	800	720	2,020	1,780	3,380	2,550	2,860	1,450	1,350
9.....	868	2,660	868	1,560	840	1,780	1,670	3,770	3,570	2,700	1,350	800
10.....	782	1,880	825	1,350	880	1,560	1,670	4,180	5,270	4,830	1,250	840
11.....	782	1,560	740	7,990	880	1,450	2,020	3,770	5,730	3,970	1,250	880
12.....	622	2,120	700	3,030	640	1,350	2,280	3,570	6,210	2,700	1,180	640
13.....	515	6,210	660	2,020	605	1,350	2,410	4,390	6,700	2,860	1,000	640
14.....	515	3,170	622	1,780	535	1,780	4,390	4,390	7,470	2,860	1,000	720
15.....	515	2,370	585	1,450	500	1,670	4,180	3,030	6,700	2,700	1,200	640
16.....	515	2,120	622	1,350	500	1,560	3,380	2,860	4,390	2,700	1,350	605
17.....	515	1,880	2,660	1,350	500	2,550	3,200	2,700	3,770	2,550	1,560	570
18.....	450	1,560	5,500	3,970	470	6,950	3,200	3,030	3,770	2,280	1,150	535
19.....	450	2,370	7,450	2,280	500	5,050	3,970	3,770	3,570	1,900	1,000	1,560
20.....	515	1,770	2,510	1,670	535	3,380	2,860	4,180	3,970	2,150	920	1,050
21.....	450	1,360	2,510	1,560	640	2,700	2,860	4,180	5,270	2,550	960	800
22.....	868	1,270	1,880	1,250	720	2,550	2,410	3,380	5,270	2,550	1,000	680
23.....	1,360	1,360	1,660	1,200	720	2,280	2,150	3,570	4,390	2,410	1,050	570
24.....	1,560	1,270	1,660	1,100	1,150	2,550	2,150	2,860	3,970	2,280	1,000	535
25.....	1,560	1,040	1,560	1,150	4,830	3,770	2,150	2,410	3,770	2,550	1,100	640
26.....	1,770	1,000	1,360	960	25,000	2,700	2,550	2,280	4,180	2,280	920	570
27.....	1,880	910	1,270	920	17,500	2,280	3,200	2,150	4,390	2,020	880	535
28.....	2,510	825	1,180	880	10,600	2,020	2,860	2,410	4,390	1,900	880	500
29.....	2,120	825	1,040	840	5,970	2,700	2,700	2,860	4,390	1,670	920	570
30.....	1,770	782	1,000	800	-----	2,700	3,030	2,860	3,970	1,560	760	535
31.....	1,770	-----	1,090	760	-----	2,860	-----	3,200	-----	1,560	760	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	2,510	450	1,140	3.89	4.48	70,100
November.....	6,210	782	2,130	7.27	8.11	127,000
December.....	7,450	585	1,570	5.36	6.18	96,500
January.....	7,990	760	1,550	5.29	6.10	95,300
February.....	25,000	470	2,770	9.45	10.19	159,000
March.....	6,950	1,350	2,710	9.25	10.66	167,000
April.....	4,390	1,670	2,730	9.32	10.40	162,000
May.....	4,390	2,150	3,270	11.2	12.91	201,000
June.....	7,470	2,410	4,240	14.5	16.18	252,000
July.....	6,700	1,560	2,870	9.80	11.30	176,000
August.....	1,780	760	1,190	4.06	4.68	73,200
September.....	1,560	500	735	2.51	2.80	43,700
The year.....	25,000	450	2,240	7.65	103.99	1,620,000

## SAUK RIVER NEAR SAUK, WASH.

LOCATION.—Water-stage recorder in NW¼ sec. 19, T. 34 N., R. 10 E., 5 miles above mouth and 5 miles southeast of Sauk.

DRAINAGE AREA.—714 square miles.

RECORDS AVAILABLE.—July 1928 to September 1932; August 1910 to August 1912 for station 1 mile below.

EXTREMES.—Maximum discharge during year, 68,500 second-feet Feb. 26 (gage height, 15.83 feet); minimum, 1,010 second-feet Oct. 20 (gage height, 3.07 feet).

1910-12, 1928-32: Maximum discharge, that of Feb. 26, 1932; minimum, 572 second-feet Dec. 5, 1929 (gage height, 2.62 feet); discharge may have been less sometime Jan. 10-27, 1930, when stage-discharge relation was affected by ice.

REMARKS.—Records excellent except those for Feb. 1, 2, 7-27, which were estimated. No diversions or regulation.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,300	4,150	1,680	2,180	1,600	8,900	6,770	6,920	6,620	8,300	3,680	2,220
2	1,880	5,700	1,820	2,030	1,500	7,240	6,620	7,210	6,480	7,820	3,570	1,990
3	1,620	4,200	1,920	1,930	1,550	5,900	6,200	6,920	6,200	9,460	3,860	1,720
4	1,680	3,410	1,820	1,900	1,520	5,400	5,520	6,770	6,620	11,400	4,020	1,680
5	4,080	3,300	1,760	2,000	1,480	7,900	5,520	6,480	5,920	7,520	4,140	1,870
6	2,950	4,420	1,710	2,370	1,460	6,900	4,880	6,240	5,260	6,060	4,020	2,070
7	2,270	7,250	1,980	2,090		5,530	4,380	7,060	5,130	5,920	4,020	2,130
8	1,900	5,160	2,160	2,010		4,900	4,140	6,920	5,390	6,060	3,910	2,470
9	1,680	4,780	1,960	2,780	1,700	4,300	3,800	7,360	7,220	5,920	3,250	2,070
10	1,530	4,310	1,900	2,780		3,960	3,680	8,630	9,640	8,180	2,940	1,840
11	1,410	3,520	1,770	9,990		3,620	4,020	7,820	11,400	7,520	2,940	1,910
12	1,320	3,300	1,650	6,830		3,400	5,000	7,820	13,000	5,920	2,740	1,580
13	1,260	7,470	1,600	4,420	1,600	3,300	6,060	8,300	14,300	5,920	2,470	1,510
14	1,210	6,150	1,530	3,630		3,730	7,980	7,820	14,300	6,060	2,380	1,740
15	1,150	4,660	1,490	3,190		3,960	6,620	6,620	13,800	5,920	2,650	1,720
16	1,130	3,850	1,520	2,780		3,620	6,200	6,060	10,300	6,200	3,140	1,620
17	1,100	3,630	4,810	2,680		4,830	6,060	6,200	8,300	5,920	3,060	1,630
18	1,080	3,300	7,520	4,700	1,300	8,120	6,200	6,920	7,980	5,130	3,340	1,380
19	1,040	3,740	10,200	4,660		9,230	7,210	7,210	7,520	4,500	2,650	1,510
20	1,050	3,630	8,500	3,740		7,670	6,620	8,960	8,630	4,380	2,940	2,100
21	1,060	2,980	5,700	3,300		6,280	5,520	7,820	11,000	5,260	2,470	1,620
22	1,340	2,680	4,420	2,980		5,400	4,880	7,060	11,400	5,920	2,470	1,410
23	1,840	2,410	3,850	2,680	2,800	5,030	4,500	6,770	10,300	5,650	2,470	1,330
24	2,410	2,270	3,740	2,500		6,020	4,260	6,200	9,300	5,390	2,560	1,440
25	2,590	2,270	3,520	2,390		6,920	4,260	5,390	8,630	5,260	2,650	1,570
26	2,680	2,110	3,190	2,250	51,400	5,780	5,000	4,880	8,630	4,760	2,740	1,340
27	2,680	1,930	2,980	2,160	44,500	5,000	5,780	4,630	8,960	4,500	2,650	1,370
28	3,520	1,850	2,680	2,010	23,600	6,480	5,780	4,630	8,960	4,880	2,560	1,430
29	3,520	1,770	2,500	1,880	12,700	5,920	5,520	5,390	9,640	4,260	2,220	1,440
30	3,300	1,720	2,280	1,800		5,650	6,060	5,920	8,960	3,680	2,130	1,430
31	3,190		2,230	1,700		5,650		6,340		3,570	1,840	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	4,080	1,040	1,990	2.79	3.22	122,000
November	7,470	1,720	3,730	5.22	5.82	222,000
December	10,200	1,490	3,110	4.36	5.03	191,000
January	9,990	1,700	3,040	4.26	4.91	187,000
February	51,400		6,090	8.53	9.20	350,000
March	9,230	3,300	5,690	7.97	9.19	350,000
April	7,980	3,680	5,510	7.72	8.61	328,000
May	8,960	4,630	6,750	9.45	10.90	415,000
June	14,300	5,130	8,990	12.6	14.06	535,000
July	11,400	3,570	6,040	8.46	9.75	371,000
August	4,140	1,840	2,970	4.16	4.80	183,000
September	2,470	1,330	1,700	2.38	2.66	101,000
The year	51,400	1,040	4,620	6.47	88.15	3,360,000



## UPPER COLUMBIA RIVER BASIN

## MAIN STREAM

## COLUMBIA RIVER AT TRAIL, BRITISH COLUMBIA

(International gaging station)

LOCATION.—Chain gage on highway bridge at Trail, 15 miles above international boundary and mouth of Clark Fork.

DRAINAGE AREA.—34,000 square miles.

RECORDS AVAILABLE.—April 1913 to September 1932.

EXTREMES.—Maximum discharge during year, 270,000 second-feet June 25 (gage height, 37.0 feet); minimum 13,400 second-feet Feb. 17 (gage height, 7.70 feet).

1913-32: Maximum discharge, 312,000 second-feet June 14, 15, 1913 (gage height, 41.6 feet); minimum, 9,600 second-feet Mar. 28, 1917.

REMARKS.—Records good. Small amount of water diverted above station. No regulation except natural storage in lakes. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44,800	27,100	22,900	19,600	16,900	17,300	28,400	70,100	178,000	254,000	185,000	95,900
2	43,600	26,900	22,700	19,800	17,000	18,200	29,400	71,400	181,000	250,000	131,000	92,400
3	42,500	26,800	22,400	19,800	16,900	19,000	30,300	74,000	185,000	248,000	128,000	89,000
4	42,200	26,800	22,200	19,800	16,400	20,000	31,300	78,600	190,000	244,000	125,000	85,100
5	42,000	26,700	21,700	19,700	15,900	20,900	32,200	82,800	195,000	239,000	120,000	81,200
6	41,700	26,700	21,500	19,700	15,200	22,400	32,600	91,300	201,000	232,000	117,000	77,000
7	41,500	26,600	21,200	19,600	14,400	23,300	33,000	98,800	203,000	225,000	114,000	73,000
8	41,400	26,500	20,800	19,500	14,200	24,000	33,500	106,000	206,000	218,000	112,000	71,400
9	41,700	26,300	20,400	19,500	13,700	24,200	34,300	111,000	207,000	211,000	109,000	70,200
10	40,900	26,100	20,100	19,600	13,600	24,400	35,000	120,000	209,000	208,000	108,000	69,100
11	39,900	25,900	19,700	19,600	13,500	24,600	35,700	127,000	211,000	195,000	108,000	68,500
12	38,900	25,900	19,400	19,900	13,600	24,700	36,300	135,000	216,000	187,000	109,000	67,800
13	37,800	26,200	19,100	19,900	13,500	24,800	37,000	143,000	223,000	182,000	108,000	66,500
14	36,600	26,300	18,700	19,900	13,600	24,900	37,900	149,000	224,000	175,000	109,000	65,400
15	35,500	26,500	18,300	19,800	13,600	24,900	39,400	154,000	243,000	171,000	109,000	65,200
16	34,400	26,600	18,200	19,700	13,500	24,800	42,200	158,000	254,000	165,000	107,000	63,600
17	33,200	26,500	18,400	19,800	13,400	24,700	44,200	161,000	261,000	162,000	105,000	62,800
18	32,300	26,400	18,500	19,500	13,500	24,800	47,100	162,000	265,000	159,000	103,000	61,400
19	31,700	26,300	18,600	19,100	13,600	24,900	51,100	163,000	263,000	154,000	103,000	59,900
20	31,100	26,200	18,800	18,700	13,500	25,000	52,600	169,000	260,000	152,000	103,000	57,900
21	30,500	26,100	18,900	18,300	13,500	25,100	53,700	173,000	258,000	147,000	104,000	56,400
22	29,900	26,000	19,100	17,900	13,500	25,300	55,100	179,000	260,000	144,000	104,000	54,900
23	29,500	25,800	19,200	17,600	13,600	25,500	56,300	181,000	264,000	143,000	104,000	53,600
24	29,000	25,200	19,300	17,100	13,900	25,700	57,800	186,000	268,000	141,000	104,000	52,100
25	28,900	24,800	19,500	16,900	14,100	25,900	59,300	188,000	270,000	141,000	104,000	50,500
26	28,600	24,400	19,600	16,800	14,400	26,200	61,200	189,000	269,000	140,000	103,000	49,000
27	28,400	24,000	19,600	16,700	15,000	26,400	62,700	188,000	265,000	140,000	102,000	47,600
28	28,100	23,600	19,600	16,700	15,600	26,600	63,900	186,000	261,000	139,000	101,000	46,200
29	27,800	23,400	19,600	16,900	16,300	26,900	66,300	183,000	258,000	139,000	101,000	45,100
30	27,600	23,200	19,500	16,900	-----	27,400	68,800	179,000	256,000	139,000	100,000	43,700
31	27,200	-----	19,600	17,000	-----	27,800	-----	177,000	-----	133,000	98,000	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	44,800	27,200	35,100	1.03	1.19	2,160,000
November	27,100	23,200	25,900	.76	.85	1,540,000
December	22,900	15,200	19,900	.59	.68	1,220,000
January	19,900	16,700	18,800	.55	.63	1,160,000
February	17,000	13,400	14,500	.43	.46	834,000
March	27,800	17,300	24,200	.71	.82	1,490,000
April	68,800	28,400	45,000	1.32	1.47	2,680,000
May	189,000	70,100	143,000	4.21	4.85	8,790,000
June	270,000	178,000	224,000	6.88	7.68	13,900,000
July	254,000	136,000	180,000	5.30	6.11	11,100,000
August	135,000	98,000	109,000	3.21	3.70	6,700,000
September	95,900	43,700	64,700	1.90	2.12	3,850,000
The year	270,000	13,400	76,300	2.24	30.49	55,400,000

## COLUMBIA RIVER AT KETTLE FALLS, WASH.

**LOCATION.**—Water-stage recorder in northwest corner lot 1, sec. 14, T. 36 N., R. 37 E.,  $3\frac{1}{4}$  miles above mouth of Colville River at Kettle Falls. Gage datum is mean sea level.

**DRAINAGE AREA.**—64,500 square miles.

**RECORDS AVAILABLE.**—April 1913 to September 1932.

**EXTREMES.**—Maximum discharge during year, 354,000 second-feet June 18 (gage height, 1,194.50 feet); minimum (estimated), 18,300 second-feet Feb. 3, 4.

1913-32: Maximum discharge, 468,000 second-feet June 14, 15, 1913 (gage height, 34.2 feet, from high-water mark referred to United States Weather Bureau gage at Marcus); minimum (estimated), 13,000 second-feet Jan. 18-21, 1930, when stage-discharge relation was affected by ice.

Maximum discharge during 1894 flood, 700,000 second-feet, based on information from several sources.

**REMARKS.**—Records excellent. Discharge estimated because of ice Jan. 25 to Feb. 5. Numerous diversions above gage for irrigation, but amount very small in proportion to flow past gage. No regulation except effect of natural storage in numerous lakes above gage.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	47,600	32,300	25,600	27,100		30,600	51,300	132,000	273,000	327,000	158,000	108,000
2.....	47,000	31,800	25,600	27,100		32,800	54,000	135,000	277,000	323,000	155,000	105,000
3.....	46,400	31,800	26,100	26,600	18,500	35,000	56,800	137,000	284,000	319,000	152,000	102,000
4.....	45,800	31,200	26,100	26,600		36,200	59,000	143,000	288,000	310,000	148,000	98,600
5.....	45,200	31,200	25,600	25,600		36,800	60,400	149,000	290,000	308,000	143,000	94,500
6.....	45,800	31,200	25,100	25,100	19,100	37,400	61,200	153,000	291,000	300,000	140,000	90,500
7.....	45,800	31,200	25,100	24,600	19,500	38,000	62,000	164,000	293,000	291,000	136,000	85,500
8.....	45,200	31,800	25,100	24,600	19,900	38,600	62,000	176,000	297,000	282,000	134,000	83,500
9.....	45,200	31,800	25,100	28,100	20,300	39,200	62,000	181,000	297,000	272,000	132,000	80,500
10.....	44,600	31,800	24,600	28,100	20,700	38,600	62,700	192,000	299,000	261,000	128,000	79,500
11.....	44,000	31,800	24,600	27,600	20,700	38,600	63,400	202,000	300,000	251,000	127,000	78,500
12.....	42,200	31,200	24,600	27,600	20,300	38,000	65,000	210,000	304,000	242,000	126,000	77,500
13.....	41,600	31,800	24,200	27,100	19,900	38,600	69,200	218,000	312,000	234,000	126,000	76,500
14.....	40,400	32,300	23,800	27,100	19,900	38,000	78,500	229,000	319,000	228,000	125,000	74,600
15.....	39,200	32,300	23,800	27,100	19,900	38,000	90,500	234,000	329,000	218,000	125,000	73,600
16.....	38,000	32,300	23,300	26,100	19,900	37,400	93,500	239,000	341,000	212,000	124,000	71,800
17.....	37,400	32,300	23,300	26,100	19,900	36,800	94,500	242,000	347,000	205,000	121,000	70,000
18.....	36,800	32,300	23,300	26,100	19,500	37,400	96,500	249,000	351,000	199,000	121,000	68,300
19.....	35,600	32,300	25,100	25,100	19,100	38,600	99,700	253,000	351,000	194,000	118,000	66,600
20.....	35,000	31,800	26,100	25,600	19,100	39,800	104,000	262,000	347,000	190,000	117,000	65,000
21.....	34,500	31,800	26,100	25,600	19,100	39,800	104,000	270,000	345,000	184,000	118,000	64,200
22.....	34,500	31,200	25,100	25,100	19,100	40,400	105,000	281,000	343,000	180,000	118,000	62,700
23.....	35,000	30,600	25,100	23,800	19,100	40,400	108,000	286,000	347,000	177,000	118,000	61,200
24.....	34,000	30,100	25,600	22,800	19,100	42,800	114,000	288,000	349,000	174,000	117,000	59,700
25.....	33,400	29,600	26,100		19,100	43,400	116,000	290,000	351,000	172,000	116,000	58,200
26.....	33,400	29,600	26,100		19,900	44,000	118,000	290,000	351,000	170,000	116,000	56,800
27.....	33,400	29,600	26,100		22,400	44,000	122,000	288,000	343,000	169,000	115,000	54,700
28.....	32,800	29,100	27,100	21,500	26,600	45,200	125,000	286,000	347,000	168,000	114,000	53,300
29.....	32,800	28,100	27,100		28,600	47,000	128,000	282,000	337,000	165,000	114,000	52,000
30.....	32,300	26,600	27,100			48,200	130,000	279,000	331,000	163,000	112,000	51,300
31.....	32,300		26,600			49,400		275,000		161,000	111,000	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	47,600	32,300	39,300	0.609	0.70	2,420,000
November.....	32,300	26,600	31,100	.482	.54	1,850,000
December.....	27,100	23,300	25,300	.392	.45	1,560,000
January.....	28,100		25,100	.389	.45	1,540,000
February.....	28,600		20,100	.312	.34	1,160,000
March.....	49,400	30,600	39,600	.614	.71	2,480,000
April.....	130,000	51,300	87,200	1.35	1.51	5,190,000
May.....	260,000	132,000	226,000	3.50	4.04	13,900,000
June.....	351,000	273,000	321,000	4.98	5.56	19,100,000
July.....	327,000	161,000	227,000	3.52	4.06	14,000,000
August.....	158,000	111,000	127,000	1.97	2.27	7,810,000
September.....	108,000	51,300	74,100	1.15	1.28	4,410,000
The year.....	351,000		104,000	1.61	21.91	75,400,000

## COLUMBIA RIVER AT GRAND COULEE, NEAR NESPELEM, WASH.

LOCATION.—Water-stage recorder in lot 6, sec. 36, T. 29 N., R. 30 E., 4,000 feet below Grant County Ferry, at Grand Coulee, 15 miles south of Nespelem. Gage datum is at mean sea level.

DRAINAGE AREA.—74,100 square miles.

RECORDS AVAILABLE.—June to December 1923; June 1928 to September 1932; monthly discharge April 1913 to June 1923 and January 1924 to May 1928.

EXTREMES.—Maximum discharge during year, 363,000 second-feet June 19, 20 (gage height, 973.2 feet); minimum occurred during period Jan. 29 to Feb. 23.

1913-32: Maximum discharge, 492,000 second-feet June 15, 1913 (determined from records at other gaging stations); minimum (estimated), less than 16,000 second-feet in January 1930, when stage-discharge relation was affected by ice.

Maximum discharge during flood of June 1894 estimated at 725,000 second-feet.

REMARKS.—Records excellent. Stage-discharge relation affected by ice Jan. 29 to Feb. 23. Diversions for irrigation above station are small in comparison with flow past gage. Some diurnal fluctuation, owing to operation of power plants on Spokane River.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	52,500	35,400	29,900	29,400		45,400	72,900	162,000	300,000	334,000	166,000	111,000
2.....	51,400	34,400	28,600	29,000		47,000	75,900	164,000	299,000	331,000	162,000	108,000
3.....	50,300	34,400	28,600	29,400		49,200	80,400	167,000	302,000	327,000	160,000	104,000
4.....	49,800	34,000	29,000	29,400		51,400	83,700	170,000	307,000	322,000	155,000	101,000
5.....	48,600	34,000	28,600	29,900	23,000	52,500	87,000	176,000	312,000	316,000	150,000	97,500
6.....	49,200	34,400	28,200	29,400		51,400	89,000	184,000	313,000	311,000	146,000	93,900
7.....	49,200	34,000	28,200	29,000		53,600	89,000	191,000	313,000	301,000	142,000	90,400
8.....	49,200	34,400	27,800	28,200		55,200	89,000	201,000	314,000	292,000	139,000	87,600
9.....	49,200	34,000	27,800	28,200		54,200	89,000	210,000	316,000	283,000	135,000	85,000
10.....	48,600	34,900	27,800	31,700		53,600	88,300	218,000	316,000	274,000	133,000	83,000
11.....	48,100	34,400	27,400	32,600		52,000	87,600	229,000	317,000	263,000	130,000	82,400
12.....	41,500	34,900	26,300	32,600	24,000	51,400	88,300	238,000	319,000	254,000	128,000	81,100
13.....	45,400	34,000	27,400	36,400		50,300	93,200	245,000	324,000	245,000	128,000	80,400
14.....	44,200	34,000	26,600	34,000		50,300	99,000	255,000	330,000	236,000	128,000	79,800
15.....	44,200	34,400	26,600	33,500		49,200	111,000	264,000	337,000	229,000	128,000	78,500
16.....	42,600	34,900	26,600	33,000		51,400	122,000	269,000	347,000	222,000	128,000	77,200
17.....	41,500	34,900	26,300	32,600		52,500	125,000	272,000	355,000	214,000	125,000	75,300
18.....	40,400	35,400	27,000	31,200		52,500	128,000	277,000	359,000	209,000	123,000	74,100
19.....	38,900	35,400	27,000	32,600		56,400	131,000	281,000	360,000	201,000	121,000	72,300
20.....	39,400	35,400	28,200	31,700	23,000	59,100	136,000	284,000	360,000	199,000	120,000	71,100
21.....	38,400	34,400	29,000	28,600		59,700	140,000	294,000	356,000	195,000	120,000	69,900
22.....	38,400	34,000	29,000	31,200		60,300	140,000	305,000	353,000	189,000	119,000	68,700
23.....	37,400	34,000	29,000	29,900		60,300	141,000	313,000	352,000	186,000	120,000	66,900
24.....	37,400	33,500	28,600	28,200	23,600	60,300	144,000	318,000	364,000	182,000	120,000	65,100
25.....	36,900	33,000	29,000	27,000	24,700	62,700	147,000	319,000	356,000	179,000	119,000	63,900
26.....	35,400	32,600	28,200	27,000	33,300	65,100	148,000	319,000	356,000	178,000	117,000	61,500
27.....	36,400	32,200	29,000	27,000	42,000	65,100	150,000	319,000	353,000	177,000	117,000	60,300
28.....	36,400	34,400	28,600	27,000	45,900	65,100	153,000	317,000	349,000	174,000	115,000	59,100
29.....	35,900	32,200	29,000	26,500	45,900	66,300	156,000	312,000	343,000	171,000	114,000	58,000
30.....	35,400	30,400	29,900	25,500		69,300	160,000	307,000	340,000	169,000	114,000	56,900
31.....	35,900		29,900	24,500		71,700		304,000		168,000	112,000	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	52,500	35,400	43,000	0.580	0.67	2,640,000
November.....	35,400	30,400	34,100	.460	.51	2,030,000
December.....	29,900	26,300	28,200	.381	.44	1,730,000
January.....	36,400	24,500	29,900	.404	.47	1,840,000
February.....	45,900		25,900	.350	.38	1,490,000
March.....	71,700	45,400	56,300	.760	.88	3,460,000
April.....	160,000	72,900	115,000	1.55	1.73	6,840,000
May.....	319,000	162,000	254,000	3.43	3.95	15,600,000
June.....	360,000	290,000	324,000	4.51	5.09	19,900,000
July.....	334,000	168,000	237,000	3.20	3.69	14,600,000
August.....	166,000	112,000	130,000	1.75	2.02	7,990,000
September.....	111,000	56,900	78,800	1.06	1.18	4,690,000
The year.....	360,000		114,000	1.54	20.95	82,800,000

## COLUMBIA RIVER AT TRINIDAD, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 13, T. 20 N., R. 22 E., half a mile southwest of Trinidad and 12 miles below Rock Island Dam. Zero of gage is 500 feet above mean sea level.

DRAINAGE AREA.—89,700 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932. January to December 1910 and May 1913 to December 1916 at Wenatchee; January 1917 at Beverly; January 1917 to September 1930 at Vernita.

EXTREMES.—Maximum discharge during year, 387,000 second-feet June 18 (gage height, 48.0 feet); minimum, 4,120 second-feet Feb. 10 (gage height, 11.40 feet), result of regulation.

1913-32: Maximum discharge, 528,000 second-feet June 15, 16, 1913 (gage height, 45.7 feet, on original Weather Bureau gage at Wenatchee); minimum, that of Feb. 10, 1932.

Maximum discharge known, about 740,000 second-feet June 7, 1894.

REMARKS.—Records excellent. Considerable water diverted for irrigation above gage but amount small in proportion to flow past gage. Some diurnal fluctuation at low stage as result of operation of Rock Island power plant. Natural storage in numerous lakes.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	56,700	38,000	33,300	32,200	25,800	65,000	77,600	173,000	316,000	354,000	168,000	115,000
2.....	54,800	37,500	32,200	31,700	26,700	60,100	80,000	176,000	314,000	348,000	166,000	113,000
3.....	53,400	38,000	31,700	31,200	27,200	57,400	83,200	178,000	314,000	344,000	162,000	111,000
4.....	52,800	37,500	31,200	31,200	27,700	58,000	86,400	181,000	319,000	338,000	160,000	108,000
5.....	51,500	35,900	31,700	30,700	27,200	58,700	91,600	186,000	323,000	331,000	157,000	105,000
6.....	50,800	35,900	31,200	31,200	25,300	59,400	94,300	195,000	325,000	325,000	154,000	101,000
7.....	50,200	36,400	30,700	31,200	24,900	58,000	95,200	206,000	327,000	318,000	143,000	97,000
8.....	50,800	38,000	31,700	30,200	24,000	58,000	95,200	216,000	327,000	308,000	143,000	93,400
9.....	50,200	37,500	31,200	29,700	24,000	61,500	95,200	228,000	331,000	295,000	141,000	89,800
10.....	50,800	38,000	31,200	29,700	22,900	62,900	95,200	238,000	335,000	286,000	139,000	88,000
11.....	50,200	38,000	30,700	32,200	24,800	58,700	93,400	248,000	338,000	276,000	136,000	84,800
12.....	50,800	38,000	30,700	35,400	23,700	56,000	93,400	259,000	344,000	266,000	132,000	84,000
13.....	48,900	36,900	30,200	36,400	26,300	56,700	96,100	267,000	350,000	256,000	130,000	83,200
14.....	47,600	37,500	29,200	38,000	26,000	55,400	103,000	278,000	360,000	247,000	130,000	82,400
15.....	47,000	37,500	29,700	36,100	27,200	54,800	112,000	285,000	366,000	240,000	129,000	81,600
16.....	47,000	37,500	28,700	35,400	24,000	52,200	122,000	290,000	374,000	232,000	129,000	80,800
17.....	45,000	38,000	30,200	34,800	27,200	52,200	134,000	294,000	383,000	226,000	129,000	78,400
18.....	44,400	38,000	26,700	34,300	25,800	57,400	137,000	193,000	385,000	219,000	127,000	77,600
19.....	43,800	39,100	28,700	33,300	25,800	59,400	139,000	301,000	385,000	213,000	125,000	76,000
20.....	41,900	38,000	26,700	33,800	25,300	62,200	141,000	304,000	385,000	209,000	124,000	74,400
21.....	41,900	38,000	30,000	33,800	24,900	65,000	146,000	308,000	383,000	204,000	122,000	72,800
22.....	41,400	37,500	30,200	35,900	25,300	65,700	148,000	318,000	381,000	198,000	121,000	72,000
23.....	40,800	36,400	31,200	38,000	26,700	66,400	148,000	327,000	381,000	193,000	121,000	70,600
24.....	38,000	36,900	31,200	32,800	26,300	66,400	148,000	331,000	381,000	189,000	122,000	69,200
25.....	40,200	36,900	30,700	31,200	24,900	66,400	151,000	336,000	381,000	185,000	121,000	67,100
26.....	39,100	35,900	31,200	28,700	29,500	68,500	153,000	335,000	379,000	182,000	121,000	65,700
27.....	39,100	35,400	30,200	29,700	47,400	70,600	156,000	335,000	379,000	180,000	120,000	64,300
28.....	38,900	34,800	31,200	29,700	60,600	69,900	159,000	331,000	372,000	177,000	119,000	62,900
29.....	38,700	36,400	31,700	29,700	63,600	70,600	164,000	329,000	366,000	176,000	118,000	61,500
30.....	38,400	35,100	31,700	30,200	72,000	72,000	168,000	325,000	370,000	172,000	117,000	60,800
31.....	38,200	35,100	31,700	27,200	74,400	74,400	319,000	319,000	319,000	171,000	117,000	60,000

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	56,700	38,200	46,000	0.513	0.59	2,830,000
November.....	39,100	34,800	37,100	.414	.46	2,210,000
December.....	33,300	26,700	30,600	.341	.39	1,880,000
January.....	38,000	27,200	32,400	.361	.42	1,990,000
February.....	63,600	22,900	29,000	.323	.35	1,670,000
March.....	74,400	52,200	61,900	.690	.80	3,810,000
April.....	168,000	77,600	120,000	1.34	1.50	7,140,000
May.....	336,000	173,000	271,000	3.02	3.48	16,700,000
June.....	385,000	314,000	356,000	3.97	4.43	21,200,000
July.....	354,000	171,000	247,000	2.75	3.17	15,200,000
August.....	168,000	117,000	134,000	1.49	1.72	8,240,000
September.....	115,000	60,800	83,000	.925	1.03	4,940,000
The year.....	385,000	22,900	121,000	1.35	18.34	87,800,000

**KOOTENAI RIVER BASIN**  
**KOOTENAI RIVER NEAR REXFORD, MONT.**

(International gaging station)

**LOCATION.**—Staff gage in sec. 21, T. 36 N., R. 28 W., at highway bridge 300 feet below Sullivan Creek and 1.1 miles southwest of Rexford.

**DRAINAGE AREA.**—8,420 square miles.

**RECORDS AVAILABLE.**—March 1929 to September 1932.

**EXTREMES.**—Maximum discharge during year, 62,300 second-feet June 15 (gage height, 13.50 feet); minimum discharge (estimated), 1,280 second-feet Jan. 17, 18; minimum gage height, 0.37 foot Jan. 14.

1929-32: Maximum discharge, that of June 15, 1932; minimum discharge, that of Jan. 17, 18, 1932; minimum gage height, 0.35 foot Dec. 31, 1930.

**REMARKS.**—Records good except those for period of ice effect, Nov. 23 to Dec. 20, Jan. 15 to Feb. 25, which are fair. Discharge estimated for period of ice effect and for Apr. 14, 15. No diversions or regulation. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,790	2,860	1,580	2,300	1,650	7,790	3,460	9,990	28,300	31,700	11,300	8,110
2	3,700	2,800	1,610	2,300	1,620	6,580	4,230	10,600	38,900	23,800	10,400	7,850
3	3,620	3,000	1,740	2,250	1,590	5,490	4,690	11,200	48,900	29,200	10,100	7,850
4	3,620	3,080	1,850	2,250	1,580	4,980	5,280	12,600	53,700	27,400	9,470	7,350
5	3,700	3,080	2,100	2,140	1,600	4,600	5,080	14,800	56,200	26,200	9,190	6,870
6	3,700	3,080	2,300	2,090	1,700	4,140	4,780	17,700	54,500	24,500	9,190	6,870
7	3,620	3,080	2,500	2,090	1,800	3,700	4,500	21,100	44,900	22,800	9,190	6,640
8	3,620	3,700	2,700	2,200	1,900	3,300	4,320	24,200	41,800	21,300	8,640	6,640
9	3,460	3,790	2,800	2,250	1,950	3,220	4,140	27,100	41,800	13,800	8,640	6,870
10	3,380	3,700	2,850	2,250	1,980	3,150	3,960	30,800	42,600	12,800	8,640	6,870
11	3,380	3,540	2,870	2,300	1,970	3,080	4,140	34,700	44,900	17,900	8,910	6,870
12	3,380	3,300	2,880	2,480	2,000	3,080	4,500	34,700	46,400	17,400	9,470	6,640
13	3,300	3,150	2,820	2,140	1,980	3,080	5,280	34,700	52,100	13,600	9,760	6,410
14	3,220	3,150	2,700	1,760	1,920	3,150	6,720	38,200	57,900	15,700	9,760	6,190
15	3,220	3,150	2,400	1,550	1,770	3,220	8,280	37,500	61,400	15,300	9,190	5,970
16	3,150	3,150	2,250	1,300	1,770	3,300	9,700	32,700	61,400	15,300	8,640	5,760
17	3,150	3,080	2,260	1,280	1,740	3,220	9,990	28,900	59,600	14,900	8,370	5,790
18	3,220	3,000	2,350	1,280	1,710	3,220	10,300	27,700	53,700	14,900	8,370	5,550
19	3,080	2,860	2,500	1,300	1,730	3,220	9,990	28,300	47,200	14,500	8,640	5,550
20	3,080	2,730	2,650	1,370	1,780	3,380	9,700	30,800	41,800	14,100	8,910	5,550
21	3,080	2,360	2,930	1,550	1,830	3,300	9,410	36,100	38,200	13,400	8,910	5,350
22	3,080	2,040	2,800	1,750	1,880	3,300	9,130	45,700	41,100	12,600	9,470	5,150
23	3,080	1,750	2,660	1,900	1,890	3,220	9,130	52,100	44,900	12,600	9,470	5,050
24	3,080	1,650	2,600	2,050	1,940	3,220	9,700	48,800	44,900	13,000	9,190	4,950
25	3,080	1,653	2,480	2,020	2,000	3,220	9,900	41,100	42,600	13,400	9,190	4,860
26	3,080	1,750	2,420	2,000	3,080	3,220	9,700	34,000	39,600	13,000	8,910	4,860
27	3,150	1,700	2,420	1,920	6,810	3,080	9,700	28,900	36,100	13,000	8,910	4,860
28	3,080	1,650	2,420	2,110	10,600	3,080	9,410	25,900	32,100	12,300	8,110	4,760
29	3,000	1,600	2,420	2,110	9,410	3,220	9,410	23,700	32,100	12,000	8,110	4,570
30	3,000	1,560	2,360	2,030	-----	3,220	9,700	23,200	32,700	12,000	7,850	4,570
31	3,000	-----	2,360	1,850	-----	3,220	-----	24,800	-----	12,000	8,110	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	3,790	3,000	3,290	0.391	0.45	202,000
November	3,790	1,560	2,700	.321	.36	161,000
December	2,930	1,580	2,440	.290	.33	150,000
January	2,480	1,280	1,940	.230	.27	119,000
February	10,600	1,580	2,590	.308	.33	149,000
March	7,790	3,080	3,680	.437	.50	226,000
April	10,300	3,460	7,270	.863	.96	433,000
May	62,100	9,990	28,800	3.42	3.94	1,770,000
June	61,400	28,300	45,400	5.39	6.01	2,700,000
July	31,700	12,000	17,700	2.10	2.42	1,090,000
August	11,300	7,850	9,060	1.08	1.24	567,000
September	8,110	4,570	6,040	.717	.80	359,000
The year	61,400	1,280	10,900	1.29	17.61	7,920,000

## KOOTENAI RIVER AT LIBBY, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 3, T. 30 N., R. 31 W., 1,200 feet below highway bridge at Libby.

DRAINAGE AREA.—11,000 square miles.

RECORDS AVAILABLE.—October 1910 to September 1932.

EXTREMES.—Maximum discharge during year, 61,800 second-feet June 16 (gage height, 14.06 feet); minimum, 1,500 second-feet Jan. 17 (gage height, 0.97 foot, ice-affected).

1910-32: Maximum discharge, 130,000 second-feet June 21, 1916 (gage height, 19.17 feet); minimum, 895 second-feet Jan. 11, 1930, from discharge measurement.

REMARKS.—Records good except those for July and August, when wire gage on bridge was used, which are fair. Stage-discharge relation affected by ice Nov. 27 to Dec. 6, Dec. 15-18, Dec. 24 to Feb. 4. No diversions above station.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,020	3,050	1,830	2,440	1,740	11,100	4,840	13,900	28,000	33,800	11,000	8,100
2	3,890	3,000	1,850	2,420	1,670	8,740	6,120	14,300	36,200	31,800	10,700	7,790
3	3,890	2,900	1,930	2,380	1,600	7,020	7,020	14,600	48,400	30,400	10,100	7,480
4	3,760	2,930	2,160	2,350	1,700	5,990	7,320	16,500	58,200	28,900	9,550	7,480
5	3,760	3,000	2,460	2,310	1,630	5,690	7,320	19,600	60,100	27,500	9,200	7,170
6	3,760	3,050	2,580	2,290	1,820	4,980	7,020	23,600	56,800	25,700	8,850	6,720
7	3,760	3,120	2,780	2,250	1,900	4,420	6,420	26,900	51,000	23,300	8,850	6,570
8	3,760	3,250	2,830	2,250	1,960	3,890	6,120	31,200	45,200	22,100	8,850	6,420
9	3,760	3,630	2,930	2,290	2,020	3,390	5,840	33,800	43,400	21,000	8,850	6,420
10	3,760	3,890	2,980	2,310	2,040	3,380	5,540	36,400	44,000	19,800	8,680	6,720
11	3,630	3,890	3,000	2,350	2,020	3,390	5,540	41,300	45,200	18,500	8,500	6,720
12	3,630	3,760	3,020	2,420	2,060	3,380	6,120	42,200	47,100	17,500	9,400	6,420
13	3,500	3,630	2,950	2,400	2,040	3,390	7,790	42,800	51,000	17,000	9,740	6,270
14	3,500	3,500	2,830	2,190	1,970	3,250	10,400	45,200	56,200	16,000	9,740	6,120
15	3,500	3,330	2,660	1,770	1,800	3,200	13,200	45,800	60,100	15,500	9,740	5,120
16	3,380	3,330	2,510	1,520	1,800	3,250	14,300	41,000	61,400	15,000	9,070	5,980
17	3,380	3,250	2,390	1,570	1,790	3,250	14,600	35,600	60,100	15,000	8,420	5,980
18	3,380	3,250	2,460	1,530	1,730	3,380	15,000	32,800	56,200	15,000	8,420	5,840
19	3,250	3,200	2,550	1,510	1,750	3,760	15,000	32,800	51,600	14,500	8,420	5,690
20	3,180	3,100	2,620	1,600	1,800	4,290	14,300	33,800	45,200	14,500	8,740	5,690
21	3,100	2,810	2,810	1,750	1,850	4,290	13,600	38,600	41,000	13,100	8,740	5,690
22	3,080	2,250	2,930	1,870	1,900	4,160	12,900	47,800	40,400	12,700	9,070	5,690
23	3,050	1,900	3,020	2,000	1,920	4,020	12,500	56,200	44,600	12,300	9,740	5,540
24	3,050	1,760	2,880	2,120	1,990	4,020	12,900	54,800	46,400	12,400	9,400	5,400
25	3,030	1,760	2,760	2,100	2,040	4,020	12,900	49,000	45,800	12,600	9,070	5,400
26	3,160	1,920	2,690	2,030	2,930	4,020	12,900	41,000	43,400	12,700	9,070	5,260
27	3,120	1,880	2,620	2,020	9,070	3,890	12,900	34,400	39,800	12,500	8,740	5,120
28	3,150	1,850	2,580	2,260	16,800	3,890	13,200	30,000	36,200	12,300	8,420	5,120
29	3,150	1,780	2,550	2,250	15,000	4,020	13,200	26,500	34,400	11,900	8,100	5,120
30	3,150	1,780	2,490	2,180	-----	4,160	13,600	25,000	33,800	11,500	7,790	5,120
31	3,100	-----	2,460	1,960	-----	4,290	-----	25,500	-----	11,200	8,100	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	4,020	3,050	3,440	0.313	0.36	212,000
November	3,890	1,760	2,866	.266	.29	170,000
December	3,020	1,830	2,620	.238	.27	161,000
January	2,440	1,520	2,090	.190	.22	129,000
February	16,800	1,600	3,120	.284	.31	179,000
March	11,100	3,220	4,450	.405	.47	274,000
April	15,000	4,840	10,300	.936	1.04	613,000
May	56,200	13,900	34,000	3.09	3.56	2,090,000
June	61,400	28,000	47,000	4.27	4.76	2,800,000
July	33,800	11,200	18,000	1.64	1.89	1,110,000
August	11,000	7,790	9,070	.825	.95	558,000
September	8,100	5,120	6,170	.561	.63	367,000
The year	61,400	1,520	11,900	1.08	14.75	8,660,000

\* Interpolated.

## KOOTENAI RIVER AT LEONIA, IDAHO

LOCATION.—Water-stage recorder in SW¼ sec. 17, T. 33 N., R. 24 W., at Leonia, 450 feet east of Montana-Idaho State line and half a mile above mouth of Boulder Creek. Zero of gage is 1,700.00 feet above mean sea level, United States Coast and Geodetic Survey datum.

DRAINAGE AREA.—11,740 square miles.

RECORDS AVAILABLE.—March 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 70,900 second-feet June 16; maximum water-surface elevation, 1,815.04 feet June 5; minimum discharge (estimated), 1,900 second-feet Jan. 16 (water-surface elevation 1,797.92 feet).

1928-32: Maximum discharge, 76,700 second-feet May 24, 25, 27, 1928 (water-surface elevation, 1,815.98 feet); minimum, that of Jan. 16, 1932; minimum water-surface elevation, 1,797.56 feet Dec. 10, 1929.

Floods of June 1894 and 1916 reached stages of 1,824.6 and 1,821.6 feet, respectively (information furnished by Great Northern Railway Co.).

REMARKS.—Records excellent except those estimated for July 13, 19-21, Aug. 5-8, which are good, and those estimated because of ice, Nov. 25 to Dec. 11, Dec. 14 to Feb. 29, which are fair. No regulation or diversions above station.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,400	3,500	2,000	2,920	2,200	15,100	8,720	18,500	32,800	36,800	12,500	8,620
2	4,530	3,380	2,030	2,900	2,100	11,900	10,500	18,700	44,400	35,000	11,800	8,490
3	4,270	3,360	2,100	2,800	2,050	9,620	11,800	19,300	57,700	33,400	11,200	8,240
4	4,200	3,570	2,400	2,800	1,980	7,800	11,700	21,500	66,000	33,000	10,600	8,030
5	4,230	3,650	2,600	2,700	2,100	7,650	11,200	26,100	69,000	30,000	10,000	7,760
6	4,290	3,700	2,800	2,570	2,350	6,850	10,200	31,800	65,100	28,800	9,930	7,450
7	4,290	4,000	3,000	2,550	2,550	6,220	9,340	37,700	57,700	26,900	9,890	7,220
8	4,230	4,500	3,100	2,480	2,500	5,390	8,720	42,900	51,100	24,800	9,550	7,090
9	4,150	4,780	3,150	2,450	2,500	4,890	8,340	46,400	48,600	23,000	9,430	7,090
10	4,080	4,780	3,200	2,530	2,450	4,610	8,170	50,100	49,600	21,700	9,290	7,220
11	3,970	4,530	3,200	2,800	2,450	4,630	8,410	54,000	52,600	20,400	9,430	7,320
12	3,930	4,350	3,200	2,900	2,400	4,590	9,760	55,900	54,800	19,300	9,630	7,160
13	3,910	4,130	3,100	2,800	2,400	4,570	12,800	55,900	58,700	18,400	10,100	6,940
14	3,910	4,000	2,900	2,600	2,350	4,590	17,200	59,000	64,400	17,400	10,400	6,700
15	3,820	3,950	2,700	2,200	2,350	4,590	19,800	58,100	68,700	16,800	10,300	6,540
16	3,790	3,990	2,550	1,900	2,300	4,610	20,300	50,600	70,400	16,500	9,770	6,340
17	3,720	3,930	2,650	2,050	2,300	4,660	20,100	43,800	68,100	16,300	9,240	6,180
18	3,650	3,810	2,800	2,400	2,350	4,780	20,000	40,900	64,300	16,000	8,930	6,080
19	3,630	3,740	3,040	2,600	2,350	5,430	19,800	40,200	58,200	16,000	8,990	5,940
20	3,530	3,550	3,100	2,700	2,400	6,300	19,100	43,000	50,300	15,600	9,100	5,890
21	3,480	2,940	3,200	2,830	2,400	6,450	17,900	49,900	45,400	14,800	9,210	5,870
22	3,580	2,400	2,300	2,800	2,410	6,220	16,900	61,900	44,600	14,100	9,570	5,770
23	3,630	2,190	3,200	2,750	2,450	6,130	18,100	68,300	48,500	13,800	10,000	5,630
24	3,620	2,080	3,100	2,700	2,500	6,070	19,200	66,600	51,100	13,800	9,910	5,530
25	3,600	2,330	3,050	2,500	2,550	6,320	18,800	57,900	49,600	14,100	9,650	5,460
26	3,600	2,300	3,000	2,600	4,250	6,320	18,400	47,200	46,800	14,100	9,800	5,270
27	3,620	2,200	3,000	2,650	9,700	6,050	18,000	39,400	43,000	13,800	9,570	5,250
28	3,650	2,100	3,000	2,800	18,700	6,070	17,700	34,200	39,200	13,300	9,070	5,250
29	3,630	2,000	2,930	2,600	20,000	6,450	17,800	30,600	36,900	13,000	8,620	5,160
30	3,550	1,950	2,930	2,400	-----	6,710	17,900	28,800	36,800	12,700	8,520	5,040
31	3,500	-----	2,940	2,300	-----	7,330	-----	29,800	-----	12,800	8,510	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	4,400	3,480	3,870	0.33	0.38	238,000
November	4,780	1,950	3,390	.28	.32	202,000
December	3,300	2,000	2,800	.245	.28	177,000
January	2,920	1,900	2,600	.221	.25	160,000
February	26,000	1,900	3,840	.327	.35	221,000
March	15,100	4,570	6,420	.547	.63	395,000
April	20,300	8,170	14,900	1.27	1.42	887,000
May	68,300	18,500	42,900	3.65	4.21	2,610,000
June	70,400	32,800	53,100	4.52	5.04	3,160,000
July	36,800	12,700	19,900	1.70	1.96	1,230,000
August	12,500	8,520	9,700	.83	.96	600,000
September	8,620	5,040	6,550	.558	.62	390,000
The year	70,400	1,900	14,200	1.21	16.42	10,300,000

## KOOTENAI RIVER AT KATKA, IDAHO

LOCATION.—Staff gage in NE¼ sec. 25, T. 62 N., R. 2 E., at Katka, 3,000 feet downstream from Great Northern Railway station and 3¼ miles above Moyie River. Zero of gage is 1,700.00 feet above mean sea level, United States Coast and Geodetic Survey datum.

DRAINAGE AREA.—11,860 square miles.

RECORDS AVAILABLE.—April 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 70,500 second-feet June 16 (water-surface elevation, 1,791.65 feet); minimum discharge (estimated), 1,930 second-feet Jan. 16; minimum water-surface elevation, 1,774.22 feet Nov. 23.

1928-32: Maximum discharge, 77,800 second-feet May 25, 27, 1928 (water-surface elevation, 1,793.5 feet); minimum discharge, that of Nov. 23, 1931; minimum water-surface elevation, 1,773.74 feet Dec. 11, 1929.

REMARKS.—Records excellent except those estimated for period of ice effect, Nov. 18 to Mar. 15, which are fair. Discharge measurements made 8 miles upstream. Estimated inflow is added to measured discharge to obtain flow at Katka.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,430	3,640	2,030	2,950	2,230	15,300	8,930	19,100	33,400	37,200	12,700	8,740
2	4,340	3,560	2,080	2,930	2,130	12,000	11,000	19,400	43,500	35,200	12,000	8,560
3	4,270	3,640	2,130	2,830	2,080	9,720	12,400	19,700	57,200	33,700	11,360	8,340
4	4,250	3,730	2,430	2,830	2,010	7,980	12,200	22,200	65,800	33,400	10,700	8,080
5	4,250	3,750	2,630	2,730	2,130	7,750	11,700	26,200	69,700	30,900	10,100	7,780
6	4,250	3,730	2,830	2,590	2,380	6,950	10,600	31,700	66,500	29,000	9,960	7,460
7	4,340	4,030	3,030	2,590	2,580	6,320	9,290	37,200	59,500	27,060	9,960	7,240
8	4,230	4,600	3,130	2,510	2,530	5,490	9,080	42,400	52,900	25,100	9,550	7,040
9	4,210	4,840	3,180	2,450	2,530	4,990	8,670	46,000	50,500	23,300	9,470	7,140
10	4,120	4,870	3,230	2,680	2,480	4,710	8,460	49,700	51,500	22,000	9,370	7,280
11	4,030	4,620	3,230	2,830	2,480	4,730	8,670	53,000	52,200	20,500	9,520	7,380
12	3,960	4,430	3,230	2,930	2,430	4,690	9,600	54,600	54,100	19,500	9,630	7,140
13	3,940	4,230	3,130	2,830	2,430	4,670	12,900	55,000	57,500	18,700	9,900	6,950
14	3,940	4,120	2,930	2,630	2,380	4,690	17,700	58,300	63,000	17,700	10,700	6,800
15	3,880	4,030	2,730	2,230	2,380	4,700	20,500	58,100	68,100	17,000	10,500	6,560
16	3,900	4,070	2,580	1,930	2,330	4,730	21,100	51,800	70,300	16,700	9,900	6,280
17	3,810	3,990	2,680	2,330	2,330	4,800	20,900	45,300	68,400	16,500	9,260	6,180
18	3,790	3,890	2,630	2,430	2,380	4,870	20,800	42,300	64,800	16,300	9,060	6,080
19	3,640	3,790	3,070	2,330	2,380	5,620	20,600	41,200	59,100	16,300	8,950	5,940
20	3,560	3,590	3,130	2,730	2,430	6,560	19,800	43,500	51,700	15,900	9,210	5,920
21	3,560	2,980	3,230	2,860	2,430	6,640	18,800	49,200	46,500	15,200	9,260	5,900
22	3,620	2,940	3,330	2,830	2,440	6,440	17,600	60,500	44,800	14,300	9,520	5,740
23	3,750	2,220	3,230	2,780	2,480	6,250	18,800	68,500	48,600	13,900	10,000	5,530
24	3,730	2,110	3,130	2,730	2,530	6,160	20,000	68,000	51,400	13,800	10,000	5,550
25	3,750	2,360	3,080	2,530	2,580	6,350	19,800	59,700	50,200	14,300	9,660	5,480
26	3,700	2,330	3,030	2,630	4,800	6,300	19,100	49,600	47,600	14,300	9,680	5,300
27	3,730	2,230	3,030	2,680	10,900	5,880	18,700	41,800	43,900	14,000	9,550	5,300
28	3,770	2,130	3,030	2,830	19,600	6,010	18,400	36,200	39,900	13,600	9,190	5,260
29	3,750	2,030	3,010	2,630	20,500	6,590	18,500	32,300	37,600	13,200	8,690	5,160
30	3,750	1,980	2,990	2,430	-----	6,900	18,600	30,500	37,400	12,900	8,590	5,020
31	3,640	-----	2,970	2,330	-----	7,660	-----	31,200	-----	13,100	8,670	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	4,430	3,560	3,930	0.331	0.38	242,000
November	4,870	1,980	3,480	.293	.33	207,000
December	3,330	2,030	2,910	.245	.28	179,000
January	2,950	1,930	2,630	.222	.26	162,000
February	20,500	2,010	3,980	.336	.36	229,000
March	15,300	4,670	6,530	.551	.64	402,000
April	21,100	8,460	15,400	1.30	1.45	916,000
May	68,500	19,100	43,400	3.66	4.22	2,670,000
June	70,300	33,400	53,600	4.52	5.04	3,190,000
July	37,200	12,900	20,100	1.69	1.95	1,240,000
August	12,700	8,590	9,850	.829	.96	604,000
September	8,740	5,020	6,570	.554	.62	391,000
The year	70,300	1,930	14,400	1.21	16.49	10,400,000



## KOOTENAI RIVER AT BOOM CAMP, NEAR BONNERS FERRY, IDAHO

LOCATION.—Staff gage in NW¼ sec. 29, T. 62 N., R. 2 E., 600 feet east of Boom Camp, 3½ miles upstream from Bonners Ferry, and 4 miles downstream from Movie River. Zero of gage is 1,754.08 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS AVAILABLE.—October 1927 to September 1932. From April 1925 to September 1927 records were collected by Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

EXTREMES.—Maximum water-surface elevation during year, 1,772.48 feet June 16; minimum, 1,756.20 feet Dec. 3.

1927-32: Maximum water-surface elevation, 1,774.75 feet May 28, 1928; minimum (estimated), 1,756.20 feet Jan. 1, 1931.

REMARKS.—Records good. Gage read once daily and may not take account of diurnal fluctuations. No records on days for which no elevation is shown. Elevations affected by backwater from Kootenai Lake.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57.37	-----	56.42	-----	-----	-----	59.38	-----	65.45	65.80	60.15	59.05
2	57.32	56.90	56.24	56.79	56.48	66.14	60.03	62.18	67.00	65.45	60.05	59.05
3	57.28	56.88	56.20	-----	56.44	65.34	-----	62.28	69.50	-----	59.90	58.84
4	-----	56.93	56.41	56.75	56.24	65.11	60.33	62.73	71.00	-----	59.65	-----
5	57.24	57.02	56.58	56.65	-----	64.80	60.23	63.58	-----	64.35	59.45	-----
6	57.24	57.04	-----	56.64	-----	-----	59.93	64.68	71.97	64.00	59.40	58.60
7	57.28	57.08	56.81	56.60	56.52	62.49	59.64	65.63	70.93	63.65	-----	58.55
8	57.26	-----	56.88	56.60	56.61	61.71	59.48	-----	69.54	63.30	59.35	58.55
9	57.24	57.58	56.96	56.68	56.66	61.38	59.33	67.60	79.00	62.80	59.35	58.50
10	57.20	57.58	57.00	-----	56.79	61.33	-----	68.00	69.00	-----	59.30	58.50
11	-----	57.48	56.98	-----	56.70	61.08	59.33	68.70	69.20	62.25	59.30	-----
12	57.12	57.36	57.08	-----	56.62	60.38	53.78	69.11	-----	62.05	59.30	58.45
13	57.08	57.28	-----	-----	56.51	-----	60.63	69.40	70.16	61.80	59.25	58.40
14	57.08	57.23	56.88	57.08	56.48	59.63	61.78	70.06	71.28	61.60	-----	59.35
15	57.06	-----	56.72	56.52	56.60	-----	62.43	-----	72.08	61.35	59.55	58.25
16	57.06	57.18	56.93	56.28	56.32	-----	62.53	69.25	72.48	61.25	59.35	58.15
17	57.04	57.14	56.52	56.61	-----	-----	-----	68.00	72.41	-----	59.20	58.10
18	-----	57.12	56.58	56.29	56.68	-----	62.43	67.30	71.94	61.15	59.20	-----
19	56.90	57.08	56.72	-----	56.50	-----	62.38	67.00	-----	61.05	59.15	58.05
20	56.98	57.03	-----	56.48	56.42	-----	62.28	67.45	69.48	60.95	59.15	58.00
21	56.88	56.97	57.13	56.60	56.52	58.73	61.98	68.50	68.38	60.80	-----	58.00
22	57.00	-----	57.18	56.86	56.59	58.73	61.78	-----	67.98	60.75	59.20	57.95
23	57.03	56.88	57.08	56.95	56.62	58.73	62.08	72.10	68.48	60.65	59.25	57.90
24	57.04	56.58	57.06	-----	56.60	58.73	-----	72.31	68.93	-----	59.40	57.90
25	-----	56.58	-----	56.71	56.72	58.73	62.23	71.22	68.83	60.65	59.35	-----
26	57.02	-----	57.07	56.56	57.00	58.67	62.13	69.40	-----	60.60	59.35	57.85
27	57.04	56.68	-----	56.61	60.98	58.63	61.98	67.60	67.68	60.55	59.25	57.80
28	57.06	56.68	-----	56.63	-----	58.73	61.93	66.30	66.58	60.45	-----	57.75
29	57.06	-----	56.88	57.08	72.09	58.73	61.98	-----	66.13	60.30	59.05	57.70
30	57.00	56.58	56.97	56.88	-----	58.73	62.03	-----	65.90	60.20	59.05	57.65
31	56.96	-----	56.78	-----	-----	58.93	-----	64.90	-----	-----	59.05	-----

NOTE.—Add 1,700.00 feet to obtain elevations above mean sea level.

## KOOTENAI RIVER AT BONNERS FERRY, IDAHO

LOCATION.—Wire gage in NE¼ sec. 27, T. 62 N., R. 1 E., on highway bridge at Bonners Ferry. Zero of gage is 1,743.005 feet above mean sea level, United States Coast and Geodetic Survey datum.

DRAINAGE AREA.—13,000 square miles.

RECORDS AVAILABLE.—October 1927 to September 1932. May to October 1904 at point three quarters of a mile downstream. Gage heights collected by United States Weather Bureau May 1904 to September 1927.

EXTREMES.—Maximum discharge during year, 74,700 second-feet May 23; maximum water-surface elevation, 1,770.52 feet June 17; minimum discharge, 2,080 second-feet Jan. 16; minimum water-surface elevation, 1,742.35 feet Feb. 25.

1927-32: Maximum discharge, 82,800 second-feet May 25, 1928; maximum water-surface elevation, 1,772.78 feet May 28, 29, 1928; minimum discharge, that of Jan. 16, 1932; minimum water-surface elevation, 1,741.14 feet Dec. 5, 1929.

Maximum elevation known, 1,777.2 feet in June 1894.

REMARKS.—Records of discharge good except for December, January, and February, which are fair. Gage-height records reliable. Because backwater from Kootenai Lake made it impossible to rate the station by results of current-meter measurements, discharge was obtained by combining records collected on Kootenai River at Katka, Moyie River at Eileen, Cow Creek near Bonners Ferry, and a small amount of estimated inflow. No allowance was made for time interval below Katka, which varies from about 2 to 5 hours, depending on stage and slope of river. Record of daily discharge is closely checked by frequent discharge measurements made 1½ miles downstream. No diversions or artificial regulation above station.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	43.41	42.80	43.94	43.45	43.30	56.00	46.35	53.12	61.43	63.00	57.66	47.13
2.....	43.36	42.84	43.94	43.42	43.44	54.80	47.34	53.26	63.75	62.70	57.30	47.08
3.....	43.33	42.81	44.04	43.37	43.42	53.34	48.05	53.47	66.63	61.98	47.96	46.90
4.....	43.23	42.86	44.09	43.28	43.59	52.28	48.31	54.36	68.46	61.64	47.68	46.76
5.....	43.22	42.95	44.06	43.20	43.53	52.08	48.05	55.86	69.75	61.10	47.33	46.56
6.....	43.26	42.95	43.98	43.12	43.46	51.28	47.61	57.91	69.67	60.45	49.10	46.34
7.....	43.25	43.13	43.88	43.03	43.42	50.82	47.15	59.80	68.66	59.76	48.91	46.11
8.....	43.15	43.44	43.93	43.01	43.26	49.97	46.89	61.55	67.33	59.00	48.77	46.03
9.....	43.10	43.60	43.98	43.04	43.10	49.22	46.67	62.84	66.61	58.26	48.48	45.94
10.....	43.07	43.70	43.95	42.96	43.16	48.71	46.57	64.05	66.53	57.60	48.37	45.97
11.....	42.95	43.63	43.87	42.89	42.99	49.11	46.68	65.19	66.68	56.97	48.27	45.92
12.....	42.86	43.47	43.77	43.24	42.84	48.90	47.27	65.90	67.14	56.37	48.31	45.90
13.....	42.84	43.45	43.74	43.13	42.80	48.72	48.60	66.37	67.81	55.91	48.38	45.70
14.....	42.83	43.47	43.56	43.16	42.84	48.80	50.70	67.24	68.94	55.34	48.52	45.60
15.....	42.78	43.47	43.42	42.72	42.84	48.69	52.34	67.45	69.90	54.80	48.50	45.48
16.....	42.74	43.51	43.62	42.42	42.91	48.52	52.86	66.46	70.38	54.49	48.23	45.32
17.....	43.74	43.61	44.00	42.62	42.82	48.30	52.92	65.03	70.48	54.24	47.96	45.18
18.....	42.72	43.63	43.90	42.78	42.75	44.54	52.94	64.21	70.02	53.87	47.74	45.10
19.....	42.68	43.45	43.88	42.80	42.77	44.32	53.08	63.81	69.08	53.65	47.64	44.97
20.....	42.70	43.51	43.95	42.60	42.72	44.82	52.92	64.33	67.67	53.37	47.70	44.88
21.....	42.63	43.18	44.02	42.55	42.58	44.89	52.55	65.70	66.36	52.92	47.78	44.83
22.....	42.68	42.95	43.98	42.66	42.60	44.72	52.05	68.08	65.77	52.52	47.81	44.74
23.....	42.72	43.37	43.94	42.48	42.48	44.55	52.41	69.70	66.06	52.16	47.96	44.61
24.....	42.72	43.21	43.82	42.62	42.41	44.60	53.27	69.99	66.62	51.96	47.96	44.60
25.....	42.77	43.43	43.68	42.67	42.40	44.70	53.21	68.93	66.54	51.86	47.85	44.44
26.....	42.77	43.38	43.55	42.82	42.74	44.72	53.05	67.05	66.08	51.80	47.84	44.34
27.....	42.76	43.42	43.73	42.97	47.54	44.67	52.83	64.94	65.29	51.66	47.76	44.26
28.....	42.78	43.55	43.72	42.79	55.90	44.57	52.73	63.28	64.39	51.44	47.63	44.23
29.....	42.84	43.62	43.66	42.80	59.08	44.92	52.79	62.04	63.57	51.08	47.26	44.14
30.....	42.86	43.82	43.51	43.10	-----	45.04	52.89	61.23	63.19	50.87	47.17	44.04
31.....	42.82	-----	43.58	43.28	-----	45.43	-----	61.03	-----	50.74	47.12	-----

NOTE.—Add 1,700.00 feet to obtain elevations above mean sea level.

*Discharge, in second-feet, of Kootenai River at Bonners Ferry, Idaho, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	4,510	3,740	2,150	3,070	2,380	16,100	10,100	21,400	36,500	38,100	12,900	8,870
2.....	4,420	3,660	2,200	3,050	2,280	12,700	12,400	21,700	48,700	36,000	12,200	8,690
3.....	4,350	3,750	2,250	2,950	2,230	10,300	14,000	22,100	61,800	34,500	11,500	8,470
4.....	4,330	3,840	2,560	2,950	2,160	8,510	13,700	25,000	70,200	34,200	10,900	8,200
5.....	4,340	3,860	2,770	2,850	2,280	8,260	13,000	29,500	73,700	31,600	10,300	7,900
6.....	4,340	3,840	2,970	2,710	2,540	7,420	11,700	35,700	70,100	29,760	10,100	7,580
7.....	4,450	4,160	3,170	2,710	2,740	6,760	10,300	41,700	62,800	27,600	10,100	7,360
8.....	4,320	4,790	3,260	2,630	2,690	5,880	10,100	47,200	56,200	25,700	9,720	7,160
9.....	4,300	5,010	3,310	2,620	2,690	5,350	9,600	51,200	53,700	23,900	9,610	7,260
10.....	4,210	5,030	3,360	2,830	2,640	5,070	9,410	55,500	54,700	22,500	9,530	7,400
11.....	4,120	4,770	3,360	2,980	2,640	5,080	9,740	58,800	55,300	21,000	9,670	7,490
12.....	4,040	4,580	3,360	3,080	2,590	5,030	11,000	60,200	57,200	20,000	9,770	7,250
13.....	4,020	4,390	3,260	2,980	2,590	5,000	14,900	61,000	60,600	19,100	10,100	7,060
14.....	4,020	4,290	3,060	2,780	2,540	5,010	20,300	64,500	66,100	18,100	10,800	6,910
15.....	3,960	4,200	2,860	2,380	2,540	5,020	23,000	63,400	71,100	17,400	10,600	6,670
16.....	3,980	4,230	2,700	2,080	2,490	5,040	23,600	56,600	73,000	17,100	10,090	6,390
17.....	3,890	4,140	2,800	2,230	2,490	5,120	23,300	49,900	70,900	16,900	9,400	6,290
18.....	3,870	4,040	2,950	2,580	2,540	5,220	23,100	47,000	67,100	16,700	9,200	6,180
19.....	3,720	3,930	3,190	2,790	2,540	6,020	22,900	45,700	61,200	16,600	9,800	6,050
20.....	3,640	3,720	3,250	2,890	2,600	7,020	22,000	48,700	53,700	16,200	9,340	6,030
21.....	3,650	3,100	3,350	3,020	2,600	7,110	20,800	54,900	48,300	15,500	9,390	6,010
22.....	3,720	3,060	3,450	2,990	2,610	6,910	19,600	67,200	46,500	14,600	9,660	5,850
23.....	3,870	2,340	3,350	2,940	2,650	6,740	21,400	74,700	50,200	14,200	10,100	5,640
24.....	3,850	2,230	3,350	2,890	2,700	6,660	22,600	73,300	52,900	14,100	10,100	5,660
25.....	3,860	2,480	3,200	2,690	2,750	6,880	22,300	64,200	51,600	14,500	9,800	5,590
26.....	3,820	2,450	3,150	2,790	5,560	6,840	21,400	53,500	48,900	14,500	9,810	5,410
27.....	3,840	2,350	3,150	2,840	12,300	6,410	20,900	45,100	45,100	14,200	9,680	5,410
28.....	3,880	2,250	3,150	2,960	21,100	6,600	20,600	39,100	41,000	13,800	9,320	5,360
29.....	3,850	2,150	3,130	2,780	21,600	7,280	20,800	35,000	38,600	13,400	8,820	5,260
30.....	3,850	2,100	3,110	2,580	-----	7,590	20,900	33,100	38,300	13,100	8,720	5,120
31.....	3,740	-----	3,090	2,480	-----	8,480	-----	33,900	-----	13,300	8,800	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	4,510	3,640	4,020	0.309	0.36	247,000
November.....	5,030	2,100	3,620	.278	.31	215,000
December.....	3,450	2,150	3,040	.234	.27	187,000
January.....	3,080	2,080	2,780	.214	.25	171,000
February.....	21,600	2,160	4,280	.329	.35	246,000
March.....	16,100	5,000	7,010	.539	.62	431,000
April.....	23,600	9,410	17,300	1.33	1.48	1,030,000
May.....	74,700	21,400	47,800	3.68	4.24	2,940,000
June.....	73,700	36,500	56,200	4.32	4.82	3,340,000
July.....	38,100	13,100	20,600	1.58	1.82	1,270,000
August.....	12,900	8,720	9,970	.767	.88	613,000
September.....	8,870	5,120	6,680	.514	.57	397,000
The year.....	74,700	2,080	15,300	1.18	15.97	11,100,000

## KOOTENAI RIVER NEAR BONNERS FERRY, IDAHO

LOCATION.—Water-stage recorder in NW¼ sec. 28, T. 62 N., R. 1 E., 1.6 miles downstream from highway bridge at Bonners Ferry. Zero of gage is 1,700.00 feet above mean sea level, United States Coast and Geodetic Survey datum.

DRAINAGE AREA.—13,000 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 1,769.93 feet June 17; minimum, 1,740.78 feet Feb. 3.

1928-32: Maximum water-surface elevation, 1,772.22 feet May 28, 1928; minimum, 1,740.32 feet Jan. 16, 1930.

REMARKS.—Records excellent. Elevations affected by backwater from Kootenai Lake.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43.03	42.40	42.65	42.95	41.09	52.69	45.66	52.68	61.12	62.71	50.32	46.77
2		42.46	42.63	42.93	40.94	50.58	46.74	52.85	63.03	62.36	50.05	46.72
3		42.48	42.70	42.85	40.88	48.75	47.47	53.05	65.92	61.70	49.70	46.56
4		42.52	42.82	42.79	40.95	47.80	47.81	53.84	67.81	61.43	49.41	46.38
5	42.83	42.55	42.88	42.72	40.96	46.79	47.58	55.27	69.06	60.80	49.10	46.19
6	42.83	42.54	42.94	42.64	41.08	46.24	47.18	57.25	69.09	60.15	48.84	45.98
7	42.82	42.72	42.99	42.57	41.17	45.70	46.73	59.03	68.13	59.47	48.66	45.76
8	42.71	43.01	43.09	42.55	41.24	45.06	46.44	60.71	66.88	58.76	48.49	45.62
9	42.66	43.16	43.16	42.55	41.25	44.42	46.24	62.06	66.12	58.07	48.24	45.61
10	42.66	43.30	43.23	42.51	41.31	44.15	46.11	63.34	66.01	57.38	48.11	45.57
11	42.52	43.22	43.26	42.51	41.33	44.14	46.18	64.49	66.18	56.76	47.99	45.51
12	42.45	43.07	43.20	42.79	41.26	44.01	46.74	65.20	66.55	56.19	48.00	45.48
13	42.40	43.06	43.17	42.60	41.23	43.92	48.05	65.72	67.19	55.68	48.12	45.28
14	42.36	43.10	42.99	42.42	41.06	43.91	50.07	66.54	68.31	55.15	48.20	45.16
15	42.33	43.16	42.85	42.03	41.00	43.89	51.70	66.80	69.25	54.70	48.19	45.08
16	42.32	43.23	42.77	41.75	40.95	43.81	52.29	65.94	69.75	54.34	47.94	44.92
17	42.31	43.31	42.82	41.75	40.95	43.86	52.43	64.56	69.87	54.03	47.67	44.75
18	42.28	43.36	42.94	41.80	40.89	43.72	52.48	63.70	69.50	53.63	47.42	44.70
19	42.23	43.23	43.04	41.89	40.87	43.86	52.54	63.34	68.60	53.42	47.30	44.50
20	42.24	43.30	43.23	41.87	40.95	44.26	52.46	63.83	67.27	53.12	47.37	44.44
21	42.22	43.12	43.36	41.86	41.04	44.35	52.14	65.15	66.02	52.70	47.44	44.40
22	42.22	43.02	43.37	41.92	41.08	44.20	51.68	67.32	65.40	52.30	47.46	44.30
23	42.29	42.95	43.38	41.72	41.09	44.06	52.02	68.95	65.63	51.93	47.58	44.18
24	42.30	42.87	43.30	41.64	41.33	44.07	52.75	69.32	66.12	51.70	47.58	44.07
25	42.34	43.04	43.24	41.43	41.22	44.18	52.78	68.33	66.08	51.59	47.47	44.02
26	42.32	43.03	43.09	41.49	41.77	44.17	52.60	66.54	65.69	51.53	47.44	43.92
27	42.38	42.89	43.12	41.63	46.03	44.04	52.41	64.60	64.90	51.37	47.35	43.84
28	42.45	42.84	43.13	41.62	51.38	44.10	52.31	63.03	63.98	51.16	47.11	43.76
29	42.47	42.79	43.12	41.53	55.04	44.40	52.35	61.83	63.19	50.81	46.90	43.68
30	42.46	42.68	42.99	41.48	-----	44.55	52.47	60.98	62.85	50.60	46.82	43.58
31	42.44	-----	42.98	41.28	-----	44.96	-----	60.74	-----	50.44	46.75	-----

NOTE.—Add 1,700.00 feet to obtain elevations above mean sea level.

## KOOTENAI RIVER AT KLOCKMANN RANCH, NEAR BONNERS FERRY, IDAHO

LOCATION.—Water-stage recorder in SE¼ sec. 19, T. 63 N., R. 1 E., at Klockmann ranch, 800 feet south of viaduct on Kootenai Valley branch of Great Northern Railway and 8 miles north of Bonners Ferry. Zero of gage is 1,700.00 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS AVAILABLE.—May 1928 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 1,767.66 feet June 17; minimum, 1,740.21 feet Feb. 19.

1928-32: Maximum water-surface elevation occurred on May 28, 1928, when gage was not read; minimum, 1,739.99 feet Jan. 2, 1931.

REMARKS.—Records excellent except those for period Sept. 1-30, which are fair. Elevations affected by backwater from Kootenai Lake.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42.60	42.05	42.51	42.55	40.69	50.05	44.58	51.40	59.78	61.47	49.67	46.07
2	42.61	42.11	42.48	42.51	40.56	48.23	45.47	51.56	61.38	61.14	49.39	46.04
3	42.51	42.13	42.52	42.44	40.48	46.66	46.13	51.76	63.84	60.58	49.08	45.89
4	42.41	42.15	42.56	42.38	40.51	45.44	46.45	52.48	65.43	60.30	48.80	45.75
5	42.41	42.19	42.60	42.33	40.49	44.90	46.33	53.80	66.52	59.73	48.53	45.58
6	42.42	42.20	42.63	42.28	40.53	44.63	46.03	55.61	66.68	59.16	48.28	45.42
7	42.39	42.34	42.65	42.22	40.56	44.32	45.69	57.39	66.00	58.52	48.10	45.26
8	42.29	42.53	42.72	42.18	40.60	43.91	45.46	58.98	65.01	57.86	47.93	45.12
9	42.25	42.62	-----	42.15	40.58	43.46	45.30	60.18	64.35	57.24	47.68	45.08
10	42.23	42.77	-----	42.06	40.61	43.27	45.21	61.29	64.26	56.58	47.52	45.01
11	42.10	42.73	-----	42.05	40.62	43.24	45.28	62.34	64.44	55.98	47.41	44.94
12	42.03	42.67	-----	42.21	40.56	43.25	45.70	63.02	64.79	55.44	47.38	44.92
13	41.98	42.68	-----	42.02	40.54	43.24	46.73	63.52	65.33	54.94	47.45	44.82
14	41.95	42.74	-----	41.89	40.43	43.24	48.51	64.23	66.21	54.42	47.51	44.68
15	41.91	42.81	42.58	41.67	40.38	43.23	50.10	64.54	66.97	53.99	47.47	44.60
16	41.90	42.88	42.54	41.48	40.34	43.22	50.71	63.96	67.40	55.63	47.28	44.47
17	41.90	42.95	42.56	41.43	40.32	43.20	50.85	62.83	67.62	53.29	47.05	44.34
18	41.89	43.02	42.64	41.42	40.27	43.19	50.92	62.07	67.38	52.93	46.82	44.24
19	41.88	42.94	42.69	41.46	40.24	43.23	51.02	61.74	66.71	52.69	46.68	44.06
20	41.90	42.99	42.81	41.43	40.28	43.50	50.97	62.17	65.61	52.40	46.72	43.93
21	41.88	42.87	42.89	41.38	40.34	43.56	50.72	63.32	64.55	52.00	46.78	43.86
22	41.87	42.81	42.89	41.40	40.35	43.41	50.32	65.12	63.96	51.63	46.77	43.78
23	41.96	42.78	42.89	41.25	40.35	43.32	50.60	66.00	64.09	51.30	46.83	43.68
24	41.95	42.73	42.84	41.17	40.37	43.32	51.31	-----	64.52	51.06	46.83	43.62
25	41.99	42.82	42.80	41.05	40.44	43.42	51.38	65.83	64.51	50.92	46.73	43.56
26	41.99	42.81	42.72	41.04	40.83	43.42	51.25	64.74	64.17	50.83	46.70	43.49
27	42.04	42.71	42.72	41.09	43.79	43.32	51.11	63.09	63.50	50.68	46.64	43.39
28	42.09	42.66	42.73	41.07	48.48	43.39	51.03	61.66	62.69	50.49	46.44	43.30
29	42.08	42.61	42.72	41.01	51.56	43.59	51.09	60.55	62.00	50.17	46.27	43.20
30	42.07	42.53	42.62	40.94	-----	43.73	51.20	59.79	61.64	49.94	46.18	43.11
31	42.08	-----	42.59	40.79	-----	43.99	-----	59.54	-----	49.77	46.10	-----

NOTE.—Add 1,700.00 feet to obtain elevations above mean sea level.

## KOOTENAI RIVER NEAR COPELAND, IDAHO

(International gaging station)

**LOCATION.**—Water-stage recorder in NW¼NW¼SW¼ sec. 12, T. 64 N., R. 1 W., at Andrews ranch, three quarters of a mile below Mission Creek and 1½ miles northwest of Copeland. Zero of gage is 1,700 feet above mean sea level, United States Coast and Geodetic Survey datum.

**DRAINAGE AREA.**—13,400 square miles.

**RECORDS AVAILABLE.**—October 1927 to September 1932. Gage-height records were collected by Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada, from April 1925 to September 1927.

**EXTREMES.**—Maximum mean daily discharge during year, 74,500 second-feet May 23; maximum water-surface elevation, 1,764.53 feet June 17; minimum mean daily discharge (estimated), 2,140 second-feet Nov. 30; minimum water-surface elevation, 1,740.06 feet Feb. 19.

1927-32: Maximum and minimum discharge not determined; maximum water-surface elevation at site three quarters of a mile upstream, 1,766.70 feet May 29, 1928; minimum water-surface elevation, 1,739.59 feet Jan. 25, 1930.

Maximum elevation known, about 1,774.5 feet June 1894.

**REMARKS.**—Discharge records good except those during ice-affected period, Nov. 25 to Mar. 21, which are fair. Records of water-surface elevations excellent. Elevations affected by backwater from Kootenai Lake. Daily-discharge record based on frequent discharge measurements at station referred to record of stage and slope, records of flow of river above effect of backwater from Kootenai Lake plus measured inflow from intervening tributaries with allowance for channel storage, and comparison with discharge measurements at Bonners Ferry and Port Hill. This station is one of the international gaging stations maintained by the United States under agreement with Canada. The international status of the discharge records awaits checking by and formal approval of the Dominion Water Power and Hydrometric Bureau.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42.42	41.96	42.52	42.39	40.59	47.69	43.67	49.79	58.04	59.81	48.97	45.55
2	42.41	42.03	42.49	42.35	40.50	46.24	44.28	49.95	59.09	59.54	48.72	45.51
3	42.33	42.05	42.50	42.28	40.43	45.06	44.78	50.13	60.85	59.06	48.46	45.37
4	42.23	42.08	42.52	42.23	40.41	44.20	45.10	50.66	62.13	58.77	48.22	45.23
5	42.23	42.09	42.53	42.18	40.38	43.80	45.08	51.70	63.05	58.31	47.99	45.08
6	42.22	42.11	42.53	42.15	40.38	43.65	44.92	53.21	63.33	57.84	47.75	44.92
7	42.17	42.21	42.54	42.10	40.39	43.47	44.72	54.71	62.97	57.29	47.55	44.76
8	42.09	42.34	42.59	42.07	40.41	43.21	44.58	56.10	62.29	56.73	47.38	44.68
9	42.05	42.40	42.62	42.02	40.38	42.93	44.48	57.17	61.79	56.17	47.14	44.63
10	42.04	42.53	42.66	41.92	40.40	42.80	44.43	58.19	61.70	55.59	47.00	44.53
11	41.94	42.52	42.71	41.90	40.41	42.77	44.46	59.13	61.82	55.04	46.86	44.47
12	41.86	42.49	42.70	41.99	40.38	42.71	44.72	59.79	62.09	54.54	46.82	44.45
13	41.81	42.54	42.68	41.82	40.37	42.67	45.42	60.29	62.51	54.05	46.83	44.30
14	41.76	42.61	42.63	41.72	40.28	42.66	46.74	60.95	63.23	53.60	46.83	44.21
15	41.73	42.68	42.56	41.57	40.23	42.66	48.04	61.34	63.79	53.19	46.78	44.15
16	41.73	42.75	42.52	41.43	40.20	42.63	48.62	61.04	64.16	52.84	46.62	44.03
17	41.73	42.82	42.52	41.36	40.18	42.69	48.81	60.26	64.49	52.49	46.45	43.92
18	41.72	42.90	42.56	41.33	40.14	42.69	48.94	59.70	64.42	52.14	46.28	43.86
19	41.72	42.83	42.59	41.34	40.10	42.78	49.08	59.44	64.01	51.87	46.17	43.68
20	41.74	42.88	42.67	41.30	40.12	42.96	49.12	59.74	63.26	51.58	46.18	43.59
21	41.74	42.80	42.70	41.23	40.15	42.99	48.99	60.62	62.46	51.20	46.22	43.54
22	41.73	42.76	42.70	41.24	40.15	42.88	48.75	61.92	61.97	50.87	46.20	43.46
23	41.80	42.74	42.69	41.10	40.15	42.82	48.94	62.90	61.97	50.55	46.21	43.36
24	41.81	42.69	42.66	41.03	40.15	42.82	49.50	63.35	62.25	50.31	46.19	43.28
25	41.85	42.76	42.63	40.94	40.19	42.89	49.62	63.08	62.26	50.13	46.12	43.23
26	41.85	42.74	42.58	40.90	40.41	42.89	49.54	62.16	62.03	50.02	46.09	43.16
27	41.88	42.66	42.57	40.90	41.96	42.83	49.46	60.92	61.53	49.87	46.04	43.05
28	41.96	42.64	42.58	40.89	45.30	42.88	49.43	59.76	60.92	49.70	45.91	42.99
29	41.97	42.59	42.56	40.84	48.38	43.03	49.50	58.88	60.35	49.42	45.77	42.91
30	41.97	42.55	42.47	40.76	-----	43.11	49.62	58.23	60.01	49.23	45.68	42.83
31	41.97	-----	42.44	40.64	-----	43.30	-----	57.96	-----	49.07	45.60	-----

NOTE.—Add 1,700.00 feet to obtain elevations above mean sea level.

*Discharge, in second-feet, of Kootenai River near Copeland, Idaho, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,560	3,770	2,190	3,100	2,430	17,200	11,000	23,000	37,100	38,700	12,900	8,880
2	4,460	3,720	2,230	3,080	2,330	13,800	13,500	23,200	46,800	37,400	12,400	8,760
3	4,400	3,770	2,280	2,980	2,270	11,200	15,100	23,700	60,300	35,500	11,600	8,490
4	4,380	3,900	2,510	2,980	2,210	9,300	15,400	26,200	68,100	35,300	11,000	8,270
5	4,370	3,920	2,720	2,900	2,320	8,930	14,700	30,500	73,500	32,900	10,300	8,010
6	4,360	3,930	2,920	2,770	2,520	8,110	13,500	36,400	72,600	30,700	10,000	7,720
7	4,440	4,150	3,130	2,750	2,700	7,270	12,200	42,400	66,600	28,700	10,100	7,460
8	4,350	4,720	3,220	2,680	2,730	6,400	11,400	47,700	59,800	28,600	10,000	7,240
9	4,340	4,970	3,300	2,650	2,740	5,800	10,800	51,600	66,100	25,200	9,760	7,260
10	4,250	4,980	3,350	2,830	2,690	5,430	10,400	54,900	56,000	23,300	9,440	7,400
11	4,150	4,860	3,370	2,970	2,680	5,420	10,800	58,900	57,100	22,000	9,690	7,480
12	4,070	4,680	3,370	3,050	2,640	5,330	12,300	60,800	58,800	20,900	9,790	7,370
13	4,050	4,480	3,280	3,020	2,630	5,270	15,400	61,800	62,000	20,300	10,400	7,150
14	4,040	4,370	3,100	2,840	2,600	5,420	20,300	64,400	66,300	18,800	11,100	7,020
15	4,000	4,270	2,900	2,480	2,580	5,290	24,300	64,400	71,000	18,100	11,100	6,800
16	4,000	4,260	2,750	2,170	2,550	5,320	25,400	59,700	73,100	17,500	10,700	6,520
17	3,920	4,180	2,810	2,270	2,550	5,420	25,200	52,900	72,400	17,300	10,000	6,410
18	3,880	4,070	2,940	2,530	2,590	5,630	24,900	49,000	69,400	16,800	9,260	6,300
19	3,760	3,970	3,160	2,720	2,600	6,420	24,800	47,600	63,800	17,000	9,100	6,180
20	3,680	3,760	3,240	2,870	2,650	7,500	24,200	50,000	56,000	16,600	9,160	6,150
21	3,700	3,120	3,350	2,980	2,650	7,580	23,000	55,500	49,900	16,000	9,250	6,090
22	3,760	3,080	3,440	3,010	2,650	7,430	21,300	65,900	47,300	15,200	9,530	5,950
23	3,870	2,380	3,370	2,980	2,700	7,130	22,300	74,500	49,500	14,800	10,100	5,830
24	3,870	2,270	3,280	2,940	2,750	7,130	24,400	72,500	52,500	14,600	10,300	5,730
25	3,890	2,480	3,230	2,770	2,800	7,430	24,100	68,200	52,200	14,900	9,910	5,640
26	3,860	2,470	3,180	2,810	6,000	7,430	23,500	57,300	49,900	15,100	9,900	5,480
27	3,870	2,380	3,180	2,860	13,000	7,050	22,900	48,400	46,300	14,900	9,770	5,460
28	3,890	2,280	3,170	2,930	22,500	7,250	22,400	42,300	42,000	14,500	9,410	5,430
29	3,880	2,180	3,160	2,830	22,700	7,770	22,400	37,600	39,200	13,800	8,960	5,330
30	3,880	2,140	3,140	2,660	-----	8,340	22,500	34,800	38,500	13,200	8,800	5,180
31	3,780	-----	3,120	2,550	-----	9,030	-----	34,900	-----	13,000	8,810	-----

Month	Maximum	Minimum	Mean	Per square inch	Run-off	
					Inches	Acre-feet
October	4,560	3,680	4,060	0.303	0.35	250,000
November	4,980	2,140	3,650	.272	.30	217,000
December	3,440	2,190	3,040	.227	.26	187,000
January	3,100	2,170	2,810	.210	.24	173,000
February	22,700	2,210	4,440	.331	.36	255,000
March	17,200	5,270	7,540	.563	.65	464,000
April	25,400	10,400	18,800	1.40	1.56	1,120,000
May	74,500	23,000	49,100	3.66	4.22	3,020,000
June	73,500	37,100	57,100	4.26	4.75	3,400,000
July	38,700	13,000	21,300	1.59	1.83	1,310,000
August	12,900	8,800	10,100	.754	.87	621,000
September	8,880	5,180	6,770	.505	.56	403,000
The year	74,500	2,140	15,700	1.17	15.95	11,400,000

## KOOTENAI RIVER AT LUCAS CREEK, NEAR PORT HILL, IDAHO

LOCATION.—Staff gage in sec. 28, T. 65 N., R. 1 W., at mouth of Lucas Creek, 3 miles southeast of Port Hill. Zero of gage is 1,700.00 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS AVAILABLE.—May 1928 to September 1930; May 19 to June 28, 1932.

EXTREMES.—Maximum water-surface elevation during year, 1,762.73 feet June 17; minimum occurred during period of no record.

1928-30, 1932; Maximum water-surface elevation, 1,764.69 feet May 30, 1928; minimum occurred during period of no record.

REMARKS.—Records reliable. No records obtained Oct. 1 to May 18 and July 2 to Sept. 30. Elevations affected by backwater from Kootenai Lake.

*Elevation, in feet, 1931-32*

Day	May	June	July	Day	May	June	July	Day	May	June	July
1		57.13	58.94	11		60.40		21	58.23	61.28	
2		57.93		12		60.59		22	60.23	60.86	
3		59.39		13		61.01		23	60.88	60.83	
4		60.32		14		60.60		24	61.25	61.05	
5		61.08		15		62.00		25	61.17	61.03	
6		61.33		16		62.35		26	60.46	60.85	
7		61.11		17		62.68		27	59.56	60.45	
8		60.67		18		62.67		28	58.65	59.94	
9		60.33		19	58.19	62.40		29	57.97	59.45	
10		60.28		20	58.57	61.86		30	57.44	59.17	
								31	57.12		

NOTE.—Add 1,700.00 feet to obtain elevations above mean sea level.



## KOOTENAI RIVER AT PORT HILL, IDAHO

(International gaging station)

**LOCATION.**—Water-stage recorder in SW¼ sec. 8, T. 65 N., R. 1 W., 300 feet south of international boundary at Port Hill. Zero of gage is 1,700.00 feet above mean sea level, United States Coast and Geodetic Survey datum. To correct records to agree with datum of Geodetic Survey of Canada, 1928 adjustment, 0.20 foot should be subtracted.

**DRAINAGE AREA.**—13,700 square miles.

**RECORDS AVAILABLE.**—May to July 1904; October 1927 to September 1932. Gage-height records collected by Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada, from October 1924 to September 1927 at same site.

**EXTREMES.**—Maximum mean daily discharge during year, 77,200 second-feet May 23; maximum water-surface elevation, 1,761.37 feet June 18; minimum mean daily discharge, 2,210 second-feet Nov. 30; minimum water-surface elevation, 1,739.84 feet Feb. 20.

1928-32: Maximum discharge, 83,000 second-feet May 27, 28, 1928; maximum water-surface elevation, 1,763.32 feet May 30, 1928; minimum discharge, that of Nov. 30, 1931; minimum water-surface elevation, 1,739.32 feet Jan. 28, 1930.

Maximum elevation known, 1,772.7 feet June 1894.

**REMARKS.**—Discharge records good except those for period of ice effect, Nov. 25 to Mar. 22, which are fair. Records of water-surface elevations excellent. Discharge record includes flow of Boundary Creek and represents entire flow passing international boundary. Elevations affected by backwater from Kootenai Lake. Daily-discharge record obtained by adding tributary inflow to discharges near Copeland. On May 22 dike of Reclamation Farm (adjacent to the international boundary, in Canada, and northwest of Port Hill) broke about 1¼ miles west of Port Hill, allowing part of river flow and part of normal tributary inflow to pass through break from May 22 to July 15. Estimated discharge through break is included in record of total discharge. This station is one of the international gaging stations maintained by the United States under agreement with Canada. The international status of the discharge records awaits checking by and formal approval of the Dominion Water Power and Hydrometric Bureau.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42.12	41.76	42.37	42.18	40.40	45.65	43.03	48.49	56.47	58.31	48.41	45.13
2	42.10	41.83	42.33	42.14	40.31	44.63	43.45	48.63	57.08	58.08	48.19	45.08
3	42.04	41.86	42.34	42.07	40.23	43.82	43.83	48.79	58.13	57.69	47.96	44.96
4	41.96	41.87	42.35	42.01	40.20	43.26	44.08	49.21	58.93	57.40	47.76	44.84
5	41.97	41.89	42.35	41.96	40.17	43.00	44.13	49.98	59.58	57.03	47.53	44.70
6	41.96	41.90	42.36	41.94	40.17	42.93	44.06	51.09	59.82	56.65	47.31	44.55
7	41.92	41.99	42.36	41.88	40.16	42.83	43.96	52.23	59.73	56.18	47.12	44.40
8	41.85	42.10	42.40	41.84	40.17	42.65	43.90	53.38	59.40	55.71	46.94	44.32
9	41.82	42.15	42.42	41.79	40.14	42.47	43.85	54.30	59.19	55.24	46.72	44.28
10	41.77	42.26	42.45	41.69	40.16	42.39	43.82	55.21	59.16	54.70	46.58	44.17
11	41.68	42.26	42.48	41.67	40.17	42.35	43.85	56.05	59.27	54.22	46.45	44.10
12	41.62	42.25	42.48	41.70	40.13	42.31	44.03	56.64	59.50	53.77	46.39	44.07
13	41.57	42.31	42.47	41.53	40.12	42.27	44.50	57.08	59.85	53.32	46.37	43.94
14	41.52	42.39	42.43	41.46	40.04	42.26	45.40	57.66	60.35	52.89	46.34	43.87
15	41.49	42.46	42.38	41.34	40.02	42.25	46.40	58.00	60.64	52.52	46.27	43.82
16	41.50	42.53	42.35	41.23	39.97	42.22	46.91	57.95	60.96	52.19	46.14	43.70
17	41.51	42.60	42.35	41.16	39.96	42.24	47.13	57.59	61.29	51.83	46.00	43.58
18	41.50	42.66	42.38	41.13	39.93	42.24	47.31	57.30	61.33	51.49	45.87	43.52
19	41.51	42.63	42.39	41.14	39.89	42.28	47.47	57.18	61.17	51.22	45.76	43.36
20	41.53	42.65	42.46	41.07	39.90	42.38	47.59	57.45	60.79	50.92	45.77	43.28
21	41.52	42.61	42.48	41.01	39.91	42.44	47.57	58.07	60.36	50.59	45.81	43.22
22	41.51	42.59	42.48	41.01	39.90	42.41	47.44	58.84	60.06	50.27	45.76	43.14
23	41.58	42.57	42.47	40.90	39.90	42.39	47.60	59.37	60.01	49.99	45.74	43.04
24	41.58	42.53	42.44	40.83	39.90	42.40	48.01	59.71	60.14	49.75	45.72	42.98
25	41.62	42.57	42.42	40.75	39.95	42.46	48.16	59.71	60.13	49.54	45.66	42.93
26	41.65	42.55	42.37	40.70	40.12	42.45	48.14	59.31	59.97	49.41	45.63	42.87
27	41.67	42.47	42.37	40.68	41.22	42.40	48.12	58.62	59.65	49.27	45.59	42.75
28	41.73	42.45	42.37	40.65	43.63	42.46	48.15	57.92	59.23	49.10	45.49	42.70
29	41.75	42.42	42.35	40.62	45.98	42.57	48.22	57.30	58.82	48.85	45.38	42.63
30	41.77	42.37	42.27	40.53	-----	42.63	48.34	56.79	58.52	48.69	45.31	42.57
31	41.78	-----	42.23	40.43	-----	42.77	-----	56.49	-----	48.51	45.21	-----

NOTE.—Add 1,700.00 feet to obtain elevations above mean sea level.

*Total discharge, in second-feet, of Kootenai River at Port Hill, Idaho, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	4,590	3,840	2,260	3,150	2,470	17,900	11,500	24,100	39,200	39,300	13,000	8,940
2.....	4,500	3,850	2,300	3,130	2,370	14,200	14,000	24,300	49,500	37,900	12,500	8,810
3.....	4,430	3,870	2,350	3,030	2,310	11,600	15,600	24,900	62,600	36,100	11,700	8,540
4.....	4,420	3,990	2,580	3,030	2,250	9,670	15,900	27,800	70,200	35,900	11,100	8,320
5.....	4,420	4,000	2,790	2,950	2,360	9,270	15,200	32,500	75,300	33,500	10,400	8,050
6.....	4,420	4,020	2,990	2,820	2,560	8,430	13,900	38,700	74,400	31,200	10,100	7,760
7.....	4,490	4,350	3,200	2,800	2,740	7,550	12,600	45,000	68,600	29,100	10,200	7,500
8.....	4,390	4,870	3,290	2,730	2,770	6,650	11,800	50,500	62,000	27,000	10,100	7,280
9.....	4,380	5,080	3,370	2,700	2,780	6,050	11,200	54,500	58,400	25,500	9,820	7,300
10.....	4,290	5,080	3,420	2,880	2,730	5,670	10,800	58,000	58,400	23,600	9,520	7,440
11.....	4,190	4,950	3,440	3,020	2,720	5,660	11,200	61,800	59,500	22,300	9,770	7,520
12.....	4,110	4,770	3,440	3,100	2,680	5,570	12,800	63,700	61,300	21,200	9,910	7,400
13.....	4,090	4,570	3,350	3,070	2,670	5,510	16,200	65,000	64,600	20,500	10,500	7,180
14.....	4,080	4,460	3,170	2,890	2,640	5,520	21,400	67,300	68,900	19,000	11,200	7,050
15.....	4,040	4,360	2,970	2,530	2,620	5,510	25,100	66,800	73,300	18,800	11,200	6,830
16.....	4,040	4,340	2,820	2,220	2,590	5,540	26,400	62,000	75,100	17,700	10,800	6,550
17.....	3,960	4,260	2,880	2,320	2,590	5,630	26,300	55,400	74,300	17,500	10,100	6,440
18.....	3,910	4,150	3,010	2,580	2,630	5,860	25,900	51,600	71,100	17,000	9,320	6,330
19.....	3,790	4,050	3,230	2,770	2,640	6,720	25,800	50,300	65,300	17,200	9,160	6,220
20.....	3,710	3,820	3,310	2,920	2,700	7,790	25,100	53,500	57,500	16,800	9,220	6,200
21.....	3,740	3,190	3,420	3,030	2,700	7,840	23,800	58,700	51,500	16,100	9,310	6,140
22.....	3,840	3,150	3,510	3,060	2,700	7,680	22,100	69,200	48,900	15,300	9,590	5,990
23.....	4,000	2,450	3,440	3,030	2,750	7,380	23,300	77,200	50,900	14,900	10,200	5,870
24.....	3,940	2,340	3,350	2,990	2,800	7,380	25,400	74,700	53,800	14,700	10,400	5,770
25.....	3,960	2,550	3,300	2,820	2,850	7,690	25,000	70,000	53,300	15,000	9,970	5,680
26.....	3,940	2,540	3,240	2,860	6,750	7,680	24,400	58,900	50,900	15,200	9,960	5,520
27.....	3,940	2,450	3,240	2,910	14,500	7,290	23,800	49,900	47,200	15,000	9,820	5,500
28.....	3,950	2,350	3,230	2,980	26,200	7,520	23,400	43,800	42,800	14,600	9,460	5,460
29.....	3,940	2,250	3,220	2,880	25,700	8,060	23,400	39,100	40,000	13,900	9,010	5,360
30.....	3,940	2,210	3,200	2,710	-----	8,620	23,600	36,400	39,200	13,300	8,860	5,210
31.....	3,840	-----	3,180	2,600	-----	9,430	-----	36,900	-----	13,100	8,870	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	4,590	3,710	4,110	0.300	0.35	253,000
November.....	5,080	2,210	3,740	.273	.30	223,000
December.....	3,510	2,260	3,110	.227	.26	191,000
January.....	3,150	2,220	2,860	.209	.24	176,000
February.....	26,200	2,250	4,790	.350	.38	276,000
March.....	17,900	5,510	7,830	.572	.66	481,000
April.....	26,400	10,800	19,600	1.43	1.60	1,170,000
May.....	77,200	24,100	51,400	3.75	4.32	3,160,000
June.....	75,400	39,200	58,900	4.30	4.80	3,500,000
July.....	39,300	13,100	21,500	1.57	1.81	1,320,000
August.....	13,000	8,860	10,200	.745	.86	627,000
September.....	8,940	5,210	6,810	.497	.55	405,000
The year.....	77,200	2,210	16,200	1.18	16.13	11,800,000

*Discharge, in second-feet, through break in Reclamation Farm dike near Port Hill, Idaho, 1932*

Day	May	June	July	Day	May	June	July	Day	May	June	July
1.....		3,100	2,500	11.....		4,300	500	21.....		3,800	
2.....		4,500	1,900	12.....		4,500	400	22.....	4,700	3,700	
3.....		5,100	1,700	13.....		5,100	300	23.....	9,700	3,900	
4.....		5,200	1,600	14.....		6,400	200	24.....	6,900	3,800	
5.....		5,400	1,500	15.....		6,800	100	25.....	5,000	4,000	
6.....		5,900	1,300	16.....		6,700	100	26.....	3,400	3,600	
7.....		4,600	1,200	17.....		7,300	100	27.....	2,900	3,200	
8.....		4,200	900	18.....		6,100		28.....	2,300	3,000	
9.....		4,000	700	19.....		5,300		29.....	2,100	2,700	
10.....		4,200	600	20.....		4,500		30.....	2,100	2,500	
								31.....	2,300		

NOTE.—Run-off in acre-feet through break in dike during May, 82,100; June, 273,000; July, 31,000; the period, 386,000.

## BOULDER CREEK NEAR LEONIA, IDAHO

LOCATION.—Water-stage recorder in NW $\frac{1}{4}$  sec. 32, T. 61 N., R. 3 E., half a mile below McGinty Creek, 1 mile above buildings of the Idamount Lead-Zinc Mines Co., 3 miles above mouth, and 3 miles southwest of Leonia.

DRAINAGE AREA.—53 square miles.

RECORDS AVAILABLE.—April 1928 to September 1932. Prior to November 1928 records were collected at staff-gage site  $1\frac{1}{4}$  miles downstream.

EXTREMES.—Maximum discharge during year, 1,330 second-feet May 7 (gage height, 4.80 feet); minimum discharge, 4.7 second-feet Aug. 19, 20; minimum gage height, 1.25 feet Oct. 1, 2, 3.

1928-32: Maximum discharge, that of May 7, 1932; minimum, 2 second-feet Aug. 25, Sept. 5, 1931.

REMARKS.—Records good except those estimated for period of ice effect, Jan. 11 to Feb. 26, and for other periods, Feb. 28 to Mar. 14, July 4, July 23 to Aug. 15, which are fair. An inconsiderable amount of water was diverted around gage October to May and an average of about 2 second-feet June to September; water used for mining purposes and is returned to creek below gage.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	16	16	16		200	261	485	410	50	12	7
2	6	26	16	16		100	310	454	540	48		8
3	8	21	16	16			344	508	389	52		7
4	9	17	16	16			271	652	361	52	10	6
5	12	16	16	16		85	229	368	308	46		6
6	12	17	16	16			202	926	296	42		6
7	10	62	16	16	16		193	1,040	312	37	9	6
8	10	41	16	16			182	985	327	34		6
9	10	29	16	16			187	955	327	32	8	5
10	10	26	15	16		67	207	985	323	28	6	5
11	10	22	15				258	897	308	26	7	5
12	10	21	14				355	985	296	25	7	5
13	10	21	14			65	508	1,020	285	24		5
14	10	23	19			62	626	766	271	26	5	5
15	10	20	16			59	539	580	240	24		5
16	10	19	15			56	544	570	210	22	5	5
17	10	19	16			58	521	605	187	21	5	5
18	10	18	19			89	450	555	166	20	5	5
19	10	16	19		18	156	412	526	152	20	5	5
20	10	13	23			138	371	661	144	19	5	7
21	10	9	19	16		120	340	641	136	18	5	7
22	18	14	18			110	344	687	131	17	5	7
23	27	16	17			106	383	521	117	17	6	6
24	20	18	17			108	359	398	103	15	6	6
25	18	19	16		20	106	355	327	92	15	6	6
26	22	16	16		530	98	359	289	84	15	5	6
27	18	15	18		1,100	91	379	278	76		6	6
28	16	15	17		800	108	412	289	68		6	6
29	18	16	16		500	123	450	292	63	12	6	6
30	15	16	18			125	485	312	57		7	6
31	15		17			193		343			7	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	27	6	12.6	0.238	0.27	775
November	62	9	20.6	.389	.45	1,230
December	23	14	16.7	.315	.36	1,030
January			16.0	.302	.35	984
February	1,100		116	2.19	2.36	6,670
March	200		97.2	1.83	2.11	5,980
April	626	182	361	6.81	7.60	21,500
May	1,040	278	626	11.8	13.60	38,500
June	540	57	226	4.26	4.75	13,400
July	52		26.0	.491	.57	1,600
August			6.8	.128	.15	418
September	8	5	5.9	.111	.12	351
The year	1,100		127	2.40	32.67	92,400

## MOYIE RIVER AT EASTPORT, IDAHO

(International gaging station)

LOCATION.—Water-stage recorder in SE¼ sec. 10, T. 65 N., R. 2 E., 1,000 feet downstream from international boundary at Eastport.

DRAINAGE AREA.—570 square miles.

RECORDS AVAILABLE.—August 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 5,440 second-feet May 22 (gauge height, 8.16 feet); minimum, 50 second-feet Oct. 1-3 (gauge height, 3.43 feet).

1929-32: Maximum discharge, that of May 22, 1932; minimum (estimated), 34 second-feet Jan. 16, 1930.

REMARKS.—Records excellent except those estimated because of ice, Nov. 19 to Feb. 26, which are fair. No regulation or diversions above station. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.	50	61	78	87	85	620	817	1,770	2,440	642	125	77	
2.	50	67	<sup>a</sup> 78	87		531	971	1,710	3,580	584	120	77	
3.	50	72	78			468	1,080	1,900	3,410	591	115	73	
4.	54	67	85			433	1,010	2,230	3,250	613	112	72	
5.	58	64				405	878	2,650	3,020	531	110	70	
6.	58	67	95	85		384	767	3,250	2,800	493	101	69	
7.	56	106					358	711	3,490	2,650	450	101	67
8.	54	122					328	664	3,750	2,580	416	99	65
9.	52	108				95	318	635	4,030	2,580	389	99	65
10.	52	103					299	635	4,440	2,510	368	96	65
11.	51	99	84	100		285	726	4,340	2,510	337	103	64	
12.	51	99					276	981	4,230	2,510	318	110	62
13.	51	99				95	263	1,400	4,650	2,510	299	101	61
14.	51	106				95	259	1,960	4,650	2,510	290	92	59
15.	51	103					254	1,900	4,030	2,440	276	90	58
16.	51	99	80	90		250	1,770	3,580	2,300	259	90	56	
17.	51	99					250	1,710	3,490	2,100	259	92	56
18.	51	99					263	1,710	3,490	1,900	254	86	55
19.	51	90				97	290	1,650	3,490	1,770	246	79	58
20.	51	85				<sup>a</sup> 97	337	1,590	4,130	1,650	238	77	61
21.	51		86	109		347	1,470	4,540	1,510	234	79	59	
22.	55				87		347	1,530	5,320	1,430	222	90	58
23.	69				<sup>a</sup> 87		352	2,030	4,650	1,380	214	88	58
24.	65					97	358	1,960	3,940	1,270	200	86	56
25.	62					<sup>a</sup> 109	378	1,840	3,330	1,160	192	84	58
26.	64	78				450	373	1,710	2,870	1,060	182	83	56
27.	64			87		817	363	1,650	2,580	971	169	79	55
28.	62				85	1,060	411	1,650	2,300	878	163	77	55
29.	61					808	474	1,710	2,160	767	153	73	55
30.	59					487	1,710	2,100	711	141	73	55	
31.	59					620		2,160		133	75		

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	69	50	55.3	0.097	0.11	3,400
November	122		86.5	.152	.17	5,150
December			84.9	.149	.17	5,220
January			91.8	.161	.19	5,640
February	1,060		191	.335	.36	11,000
March	620	250	367	.644	.74	22,600
April	2,030	635	1,360	2.39	2.67	80,900
May	5,320	1,710	3,400	5.96	6.87	209,000
June	3,580	711	2,070	3.63	4.05	123,000
July	642	133	318	.558	.64	19,600
August	125	73	93.1	.163	.19	5,720
September	77	55	61.8	.108	.12	3,680
The year	5,320	50	682	1.20	16.28	495,000

<sup>a</sup> Result of discharge measurement.

## MOYIE RIVER AT EILEEN, IDAHO

LOCATION.—Water-stage recorder in NE¼ sec. 35, T. 63 N., R. 2 E., one eighth of a mile downstream from Skin Creek, a quarter of a mile southeast of Eileen, and 4 miles above junction with Kootenai River.

DRAINAGE AREA.—755 square miles.

RECORDS AVAILABLE.—October 1925 to September 1932.

EXTREMES.—Maximum discharge during year, 6,840 second-feet May 22 (gage height, 4.24 feet); minimum discharge, 77 second-feet Oct. 3, 14, 15, 16, 17; minimum gage height, 0.27 foot Sept. 29, 30.

1925-32: Maximum discharge, that of May 22, 1932; maximum gage height, 4.8 feet May 17, June 10, 11, 1927, May 13, 17-19, 1928; minimum discharge (estimated), 60 second-feet Dec. 5, 1928, Jan. 16, 1930; minimum gage height, 0.71 foot Nov. 20, 1929.

REMARKS.—Records good except those estimated because of ice, Nov. 20 to Feb. 27, and those for May 7-12, which are fair. No regulation or diversions above station.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	79	93	115	118	1'0	796	1,130	2,260	3,050	838	182	124	
2.....	79	97		118		652	1,400	2,260	4,830	771	174	124	
3.....	77	104		135		568	1,600	2,350	4,580	779	171	122	
4.....	79	104		125		525	1,470	2,820	4,350	821	165	120	
5.....	89	102	135	117	150	504	1,300	3,280	3,950	715	160	117	
6.....	89	102	135			464	1,130	3,970	3,590	661	150	114	
7.....	87	120	a 135			432	1,040	4,440	3,320	624	143	113	
8.....	83	183	130			384	976	4,780	3,270	588	139	111	
9.....	81	159		356	917	5,140	3,180	547	136	111			
10.....	81	152		350	936	5,720	3,160	513	139	110			
11.....	81	146		123	145	150	340	1,060	5,720	3,050	481	141	109
12.....	79	143	329				1,390	5,520	3,050	450	150	108	
13.....	79	149	318				1,940	5,970	3,080	427	150	108	
14.....	77	166	142				313	2,620	6,120	3,050	415	141	105
15.....	77	162		313	2,530	5,210	2,930	392	132	104			
16.....	77	152	117	140	160	303	2,440	4,740	2,700	381	132	103	
17.....	77	146				313	2,350	4,540	2,490	365	136	103	
18.....	79	146				340	2,260	4,620	2,280	354	132	104	
19.....	79	134				150	390	2,290	4,500	2,120	331	125	105
20.....	79	125	a 153	452	2,180		5,160	1,930	310	122	109		
21.....	81	115	118	150	160	464	2,020	5,670	1,780	296	122	107	
22.....	95					464	2,020	6,610	1,700	278	129	105	
23.....	112					a 118	478	2,620	6,120	1,580	264	132	103
24.....	112						497	2,620	5,260	1,450	247	134	103
25.....	107						525	2,440	4,470	1,360	236	129	103
26.....	112	107	118	140	1,300	532	2,290	3,820	1,240	228	125	103	
27.....	107					518	2,180	3,270	1,140	216	125	102	
28.....	100					583	2,180	2,860	1,030	206	124	101	
29.....	97	95	118	140	1,050	677	2,290	2,680	991	199	120	101	
30.....	95					685	2,290	2,610	908	189	120	101	
31.....	93					814	2,680	2,680	185	120	120	101	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	112	77	87.7	0.116	0.13	5,390
November.....	183	-----	128	.170	.19	7,620
December.....	-----	-----	121	.160	.18	7,440
January.....	-----	-----	138	.183	.21	8,480
February.....	1,490	-----	287	.350	.41	16,500
March.....	814	303	474	.628	.72	29,100
April.....	2,620	917	1,860	2.46	2.74	111,000
May.....	6,610	2,260	4,360	5.77	6.65	268,000
June.....	4,830	908	2,570	3.40	3.79	153,000
July.....	838	185	429	.568	.65	26,400
August.....	182	120	139	.184	.21	8,550
September.....	124	101	108	.143	.16	6,430
The year.....	6,610	77	892	1.18	16.04	648,000

\* Result of discharge measurement.

## COW CREEK NEAR BONNERS FERRY, IDAHO

LOCATION.—Staff gage in SW¼ sec. 31, T. 62 N., R. 2 E., at footbridge on Goldbeck ranch, 3 miles southeast of Bonners Ferry.

RECORDS AVAILABLE.—May 1928 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 48 second-feet May 18 (gage height, 5.20 feet); minimum discharge, 0.4 second-foot Sept. 8, 9, 14-17, 28-30; minimum gage height, 3.44 feet Sept. 8, 9, 14-17.

1928-32: Maximum discharge, 56 second-feet May 23, 1928 (gage height, 5.26 feet); minimum, that of September 1932.

REMARKS.—Records fair. Discharge estimated because of ice Mar. 7-15. Some water diverted above station for irrigation during summer months. No records Oct. 1 to Feb. 25.

*Discharge, in second-feet, 1932*

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		8.0	5.4	12	18	5.1	1.8	0.6
2		4.6	5.1	12	25	4.9	1.8	.7
3		4.6	7.1	11	24	4.8	1.7	.6
4		3.9	7.3	12	23	4.3	1.6	.6
5		3.2	7.6	14	21	4.9	1.6	.5
6		3.2	6.9	20	19	4.5	1.6	.5
7		3.0	6.2	25	17	4.3	1.6	.5
8		2.9	5.6	31	17	4.2	1.6	.4
9		2.8	4.9	32	17	4.0	1.5	.4
10		2.7	4.3	37	18	3.9	1.4	.5
11		2.6	4.6	39	18	3.8	1.4	.5
12		2.5	5.2	37	17	3.3	1.4	.5
13		2.4	5.4	39	16	3.6	1.3	.5
14		2.3	7.5	43	16	3.6	1.2	.4
15		2.2	9.6	37	15	3.5	1.2	.4
16		2.1	10	32	14	3.2	1.2	.4
17		2.3	10	28	13	3.2	1.1	.4
18		2.6	11	32	12	3.1	1.1	.5
19		3.2	11	31	11	3.1	1.0	.6
20		3.9	11	35	10	2.9	1.0	.8
21		3.2	10	42	9.8	2.9	1.0	.6
22		3.2	9.6	48	9.6	2.9	.9	.5
23		3.0	13	44	8.2	2.6	.9	.5
24		3.2	14	36	7.5	2.6	.8	.5
25		5.4	12	29	7.3	2.4	.8	.5
26	45	3.9	11	24	7.1	2.3	.6	.5
27	41	3.6	11	21	6.6	2.3	.6	.5
28	24	4.0	11	19	6.4	2.3	.6	.4
29	12	4.6	12	18	6.2	2.1	.5	.4
30		3.9	12	16	5.7	1.8	.6	.4
31		4.9		17		1.8	.6	
Month		Maximum	Minimum	Mean	Run-off in acre-feet			
February 26-29		45	12	30.5	242			
March		8.0	2.1	3.48	214			
April		14	4.3	8.71	518			
May		48	11	28.2	1,730			
June		25	5.7	13.8	821			
July		5.1	1.8	3.36	207			
August		1.8	.5	1.16	71			
September		.8	.4	.50	30			
The period					3,830			

• Result of discharge measurement.

## DEEP CREEK AT MORAVIA, IDAHO

LOCATION.—Staff gage in sec. 18, T. 61 N., R. 1 E., at concrete highway bridge 1 mile below Ruby Creek and 1 mile southwest of Moravia.

DRAINAGE AREA.—133 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 819 second-feet Feb. 27, May 22; maximum gage height, 3.30 feet May 22; minimum discharge, 10 second-feet Sept. 15, 16 (gage height, 0.48 foot).

1928-32: Maximum discharge, that of Feb. 27, May 22, 1932; minimum discharge, 7 second-feet Aug. 15, 24, 25, 1931; minimum gage height, 0.86 foot Aug. 15, 1931.

REMARKS.—Records fair. Discharge estimated Mar. 10-14 because of ice. Diurnal fluctuations affect flow at high stages. No diversions above station. No record Oct. 1, Oct. 3 to Feb. 26.

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

Day	Oct.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			329	477	552	329	68	16	13
2		* 12	260	515	515	365	57	15	13
3			227	515	590	402	62	15	12
4			205	515	666	365	62	15	12
5			173	440	666	312	62	15	12
6			156	365	704	260	57	14	12
7			147	312	742	294	57	14	12
8			139	294	742	329	46	14	11
9			131	294	742	329	46	14	11
10			125	294	742	329	46	13	11
11			120	294	704	329	42	12	11
12			117	421	666	347	44	14	11
13			115	552	666	402	42	14	11
14			115	742	666	347	40	12	11
15			115	742	552	277	40	12	10
16			123	704	477	277	36	12	10
17			139	666	515	244	36	12	11
18			131	666	515	220	31	11	11
19			244	666	552	205	27	11	12
20			260	666	628	173	25	11	14
21			260	590	628	197	24	11	14
22			227	515	819	173	23	11	12
23			227	552	780	164	20	12	12
24			244	628	628	147	20	12	12
25			260	590	477	139	18	12	12
26			244	590	421	115	18	11	11
27		819	260	552	365	87	18	12	11
28		704	277	552	347	80	16	12	11
29		477	329	552	329	73	16	12	11
30			329	590	329	68	16	12	12
31			402		329		16	14	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
February 27-29	819	477	667	5.02	0.56	3,970
March	402	115	209	1.57	1.81	12,900
April	742	294	528	3.97	4.43	31,400
May	819	329	582	4.38	5.05	35,800
June	402	68	246	1.85	2.06	14,600
July	68	16	36.5	.274	.32	2,240
August	16	11	12.8	.096	.11	787
September	14	10	11.6	.087	.10	690
The period						102,000

\* Result of discharge measurement.



## SNOW CREEK NEAR MORAVIA, IDAHO

LOCATION.—Staff gage in SW¼ sec. 1, T. 61 N., R. 1 W., 2 miles northwest of Moravia and 5 miles southwest of Bonners Ferry.

DRAINAGE AREA.—19.5 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 352 second-feet May 13 (gage height, 1.96 feet); minimum discharge, 3 second-feet Sept. 7-19, 22, 23, 26-30; minimum gage height, -0.21 foot Sept. 16, 22.

1928-32: Maximum discharge, 352 second-feet May 20, 23, 1928, May 13, 1932 (gage height, 1.96 feet); minimum discharge, 2 second-feet Sept. 9-12, 16-30, 1928, Sept. 1-15, 1929, Sept. 20, 1930, Aug. 12 to Sept. 6, 29, 30, 1931; minimum gage height, that of Sept. 16, 22, 1932.

REMARKS.—Records fair. Gage read on alternate days. Discharge affected by ice Mar. 9-13. No records Oct. 1 to Feb. 27, Feb. 29 to Mar. 5. No diversions above station.

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

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....			69	113	138	51	7	4
2.....			88	113	142	46	7	5
3.....			108	130	148	43	6	4
4.....			92	150	155	40	6	4
5.....			76	169	166	37	6	4
6.....		41	68	204	177	34	6	4
7.....		39	61	239	186	32	6	3
8.....		37	58	260	194	30	5	3
9.....		35	56	280	177	26	5	3
10.....		34	56	292	229	23	5	3
11.....		33	72	303	238	22	6	3
12.....		32	117	328	249	21	6	3
13.....		31	162	352	253	20	5	3
14.....		30	162	310	258	18	5	3
15.....		28	130	269	206	17	5	3
16.....		25	127	244	155	16	5	3
17.....		25	124	220	148	15	4	3
18.....		52	122	234	130	14	4	3
19.....		60	119	248	132	14	4	3
20.....		56	116	258	135	13	4	5
21.....		48	113	269	138	12	4	4
22.....		40	118	258	142	11	4	3
23.....		44	122	248	133	10	4	3
24.....		48	120	225	124	10	4	4
25.....		47	119	177	102	10	4	4
26.....		46	119	163	79	9	4	3
27.....		46	119	149	79	8	4	3
28.....			50	116	136	79	8	3
29.....	149		54	113	124	68	8	3
30.....			59	113	124	56	7	3
31.....			64		135		7	4

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
March 6-31.....	64	25	42.5	2.18	2.11	2,190
April.....	162	56	105	5.38	6.00	6,250
May.....	352	113	217	11.1	12.8	13,300
June.....	258	56	154	7.90	8.81	9,160
July.....	51	7	20.4	1.05	1.21	1,250
August.....	7	4	4.9	.251	.29	301
September.....	5	3	3.4	.174	.19	202
The period.....						32,700

\* Estimated or interpolated.

## CARIBOU CREEK NEAR MORAVIA, IDAHO

**LOCATION.**—Staff gage in NE¼ sec. 12, T. 61 N., R. 1 W., 600 feet above road following edge of valley and 1½ miles northwest of Moravia. This gage was used in 1929 and 1932. During 1928, 1930, and 1931, a staff gage in NE¼ sec. 11, T. 61 N., R. 1 W., 1 mile upstream was used.

**DRAINAGE AREA.**—14 square miles.

**RECORDS AVAILABLE.**—May 1928 to September 1932 (except winters).

**EXTREMES.**—Maximum discharge during year, 188 second-foot May 13 (gage height, 4.84 feet); minimum, 0.3 second-foot Sept. 29, 30 (gage height, 3.30 feet).

1928-32: Maximum discharge, 234 second-feet May 20, 26, 1928; minimum, that of Sept. 29, 30, 1932.

**REMARKS.**—Records fair. Gage read on alternate days. No records Oct. 1 to Feb. 27. Flow at high stages affected by diurnal fluctuations. Several small diversions for irrigation and railroad water supply between upper and lower gage sites.

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

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		• 105	80	82	• 98	• 50	2	
2		• 80	• 90	• 90	100	45	• 2	
3		• 60	96	110	• 99	• 44	2	
4		• 47	• 85	• 118	98	43	• 2	
5		• 45	64	125	• 100	• 38	2	
6		• 43	• 52	• 140	102	33	• 2	
7		• 41	39	150	• 110	• 29	2	
8		• 39	• 40	• 150	117	24	• 2	
9		38	42	150	123	• 22	2	
10		• 34	• 46	• 148	133	19	• 2	• 0.4
11		• 29	59	145	• 139	• 18	2	
12		• 24	• 100	• 166	145	15	• 2	
13		• 23	142	188	• 150	• 14	2	
14		• 22	• 147	• 173	156	12	• 2	
15		• 22	133	159	• 138	• 10	2	
16		21	• 127	• 150	117	9	• 2	
17		• 21	125	142	• 108	• 9	1	
18		48	• 124	• 150	98	8		
19		• 55	123	159	• 102	• 7		
20		58	• 102	• 168	107	6		.7
21		42	82	178	• 112	• 5		
22		32	• 96	• 178	117	5		
23		• 38	110	178	• 110	• 4		• .4
24		44	• 97	• 145	102	4		
25		• 40	84	112	• 87	• 4		• 0.5
26		31	• 91	• 102	72	3		• .4
27		• 33	98	93	• 68	• 3		.4
28		142	35	• 92	• 90	64	3	• .4
29		• 125	• 40	86	• 59	• 3		.3
30			45	• 84	• 91	54	2	• .3
31			• 50	96		• 2		-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February 28-29	142	125	134	532
March	105	21	41.5	2,550
April	147	39	91.2	5,430
May	188	82	136	8,360
June	156	54	106	6,310
July	50	2	15.9	978
August	2		1.3	80
September			.4	24
The period				24,300

• Estimated.

## MYTLE CREEK NEAR BONNERS FERRY, IDAHO

LOCATION.—Staff gage in sec. 23, T. 62 N., R. 1 W., 80 feet upstream from power plant of Bonners Ferry Light & Water Co. and  $5\frac{1}{2}$  miles west of Bonners Ferry.

DRAINAGE AREA.—37 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 615 second-feet June 13 (gage height, 3.90 feet); minimum discharge, 4 second-feet Sept. 9-11, 13-17; minimum gage height, 1.10 feet Sept. 14-16.

1928-32: Maximum discharge, 830 second-feet May 21, 24-27, 1928 (gage height, 4.0 feet); minimum discharge, 0.4 second-foot Sept. 6-22, 30, 1929; minimum gage height, 0.50 foot Sept. 8-22, 30, 1929.

REMARKS.—Records good except those for April, May, and June, which are fair. No records Oct. 1, Oct. 3 to Feb. 10, Feb. 12-26. No flow diverted above station during current year for power purposes.

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

Day	Oct.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....			140	107	140	405	107	15	8
2.....	• 5		117	121	140	485	97	14	8
3.....			98	180	150	405	114	12	7
4.....			84	117	172	352	117	12	7
5.....			77	105	210	318	110	12	6
6.....			70	90	270	285	90	12	6
7.....			68	86	318	318	79	11	5
8.....			64	79	370	352	70	10	5
9.....			56	76	388	370	68	9	4
10.....			53	76	425	405	58	8	4
11.....		• 7	49	84	425	445	53	11	4
12.....			48	103	425	505	48	15	5
13.....			48	140	485	525	44	11	4
14.....			47	172	485	525	43	8	4
15.....			44	161	370	445	36	7	4
16.....			39	161	335	388	36	8	4
17.....			40	161	370	352	34	7	4
18.....			64	161	405	318	32	7	5
19.....			79	161	425	285	30	7	5
20.....			68	150	525	285	29	7	6
21.....			68	130	570	300	27	8	7
22.....			63	140	465	285	24	7	6
23.....			59	161	525	270	22	7	5
24.....			60	150	445	240	22	7	5
25.....			60	140	335	210	22	6	5
26.....			60	140	270	16	20	7	5
27.....			59	130	255	150	18	6	6
28.....			270	65	130	225	140	16	6
29.....			197	68	130	240	130	16	6
30.....			68	140	225	119	16	7	5
31.....			103		285		15	7	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
February 27-29.....	445	197	304	8.22	0.92	1,810
March.....	140	39	67.3	1.82	2.10	4,140
April.....	172	76	128	3.46	3.86	7,620
May.....	570	140	344	9.30	10.7	21,200
June.....	525	119	326	8.81	9.83	19,400
July.....	117	15	48.7	1.32	1.52	2,990
August.....	15	6	8.9	.241	.28	547
September.....	8	4	5.3	.143	.16	315
The period.....						58,000

• Result of discharge measurement.

## BALL CREEK NEAR BONNERS FERRY, IDAHO

**LOCATION.**—Staff gage in SW¼ sec. 24, T. 63 N., R. 1 W., three quarters of a mile above mouth of creek and 8.2 miles northwest of Bonners Ferry.

**DRAINAGE AREA.**—27 square miles.

**RECORDS AVAILABLE.**—May 1928 to September 1932 (except winters).

**EXTREMES.**—Maximum discharge during year, 358 second-feet May 21 (gage height, 3.90 feet); minimum, 4 second-feet Oct. 3, Feb. 23, Sept. 9–19, 26–30; minimum gage height, 1.96 feet Sept. 28.

1928–32: Maximum discharge, 418 second-feet May 21, 26, 1928 (gage height, 4.1 feet); minimum discharge, 4 second-feet on several days in August and September of each year and Oct. 3, 1931, Feb. 23, 1932; minimum gage height, 1.94 feet Sept. 4–10, 1930.

**REMARKS.**—Records good March to June; others fair. No records Oct. 1, 2, Oct. 4 to Feb. 22, Feb. 24 to Mar. 6. Discharge estimated Mar. 8–14, Sept. 3–27, 29, 30. Channel loses water in vicinity of gage by seepage. Diversions for irrigation above station negligible.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				52	80	217	110	17	6
2				56	86	286	89	17	6
3		• 4		58	86	272	71	9	6
4				51	87	244	68	9	5
5				45	93	217	64	9	5
6				43	177	177	69	9	5
7			31	41	217	217	68	9	5
8			29	40	217	244	53	9	5
9			28	43	244	244	44	8	4
10			27	61	272	244	41	8	4
11			26	59	272	217	40	7	4
12			25	68	258	244	37	7	4
13			25	68	286	272	33	7	4
14			24	95	300	329	32	6	4
15			24	93	244	329	29	6	4
16			24	93	244	272	27	6	4
17			22	89	244	244	26	6	4
18			21	87	272	217	25	6	4
19			35	86	300	217	24	6	4
20			32	78	329	217	23	6	6
21			32	76	344	204	21	6	6
22			32	80	329	204	21	6	5
23		• 4	28	95	272	190	20	6	5
24			27	91	244	177	20	6	5
25			25	89	217	156	18	6	5
26			25	86	177	142	17	6	4
27			26	78	159	142	14	6	4
28			25	76	156	137	13	6	4
29			28	76	162	132	12	6	4
30			29	76	164	123	12	6	4
31			39		204		11	6	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
March 7–31	39	21	27.6	1.02	0.95	1,370
April	95	40	71.0	2.63	2.93	4,260
May	344	80	217	8.04	9.27	13,500
June	329	123	218	8.07	9.00	13,000
July	110	11	37.2	1.38	1.59	2,290
August	10	6	7.1	.263	.30	437
September	6	4	4.6	.170	.19	274
The period						34,900

• Result of discharge measurement.

## TROUT CREEK NEAR COPELAND, IDAHO

LOCATION.—Staff gage in NE¼ sec. 10, T. 63 N., R. 1 W., 2¼ miles above mouth and 5½ miles southwest of Copeland.

DRAINAGE AREA.—20 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 280 second-feet (estimated) May 21; minimum, 2 second-feet Oct. 17 (gage height, -0.03 foot).

1928-32: Maximum discharge, that of May 21, 1932; minimum, 2 second-feet Sept. 19-30, 1928, Aug. 23-31, Sept. 1-9, 17-22, 1930 Aug. 17-24, 31, Sept. 4, 5, 24, 25, Oct. 17, 1931.

REMARKS.—Records fair. No records Oct. 1-16, Oct. 18 to Mar. 6. Gage read on alternate days.

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

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			• 28	• 70	110	46	• 7	4
2			36	75	• 156	• 46	7	• 4
3			• 36	• 78	179	45	• 6	4
4			33	89	• 160	• 44	6	• 4
5			• 32	• 95	144	42	• 6	4
6			31	139	• 125	• 38	6	• 4
7			23	• 27	• 175	133	34	• 5
8		• 23	24	218	• 175	• 30	5	• 4
9		23	23	236	205	27	• 5	4
10		• 22	23	244	185	• 25	5	• 3
11			21	• 27	• 250	218	24	• 5
12		• 20	34	262	• 218	• 22	5	• 3
13		19	• 85	• 250	218	19	• 5	3
14		17	85	236	• 240	• 19	5	• 3
15			• 87	• 230	211	18	• 5	3
16		• 15	89	225	• 198	• 16	5	• 3
17		2	14	• 85	• 220	185	15	• 4
18			82	218	• 159	• 14	4	• 3
19			13	• 76	• 230	133	13	• 4
20			• 15	69	• 133	• 12	4	• 3
21			16	• 63	• 280	133	12	• 4
22			16	64	254	• 131	• 12	4
23			15	• 70	• 250	128	11	• 4
24			• 16	75	247	• 110	• 10	4
25			17	• 73	• 201	98	10	• 4
26		• 16	69	155	• 88	• 9	4	• 3
27		16	59	• 120	82	9	• 4	3
28		• 17	62	110	• 68	• 8	4	• 3
29			19	• 62	• 100	53	8	• 4
30		• 19	67	97	• 50	• 8	4	• 3
31			20	110		7	• 4	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
March 7-31	23	13	17. 6	0. 880	0. 82	873
April	89	23	55. 9	2. 80	3. 12	3, 330
May	280	70	184	9. 20	10. 6	11, 300
June	240	50	147	7. 35	8. 20	8, 750
July	46	7	21. 1	1. 06	1. 22	1, 300
August	7	4	4. 8	. 240	. 28	295
September	4	3	3. 3	. 165	. 18	196
The period						26, 000

• Estimated or interpolated.

## MISSION CREEK AT COPELAND, IDAHO

LOCATION.—Staff gage in SE¼ sec. 18, T. 64 N., R. 1 E., 400 feet upstream from trestle on Kootenai Valley branch of Great Northern Railway and 0.8 mile south of Copeland.

DRAINAGE AREA.—31 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 370 second-feet May 22 (gage height 2.85 feet); minimum discharge, 3 second-feet Oct. 2, Sept. 10–19, 29, 30; minimum gage height, 0.67 foot Oct. 2.

1928–32: Maximum discharge, that of May 22, 1932; maximum gage height, 3.35 feet May 12, 1928; minimum discharge, 3 second-feet Oct. 5, 6, 1930, Aug. 11 to Sept. 6, Sept. 25–30, Oct. 2, 1931, Sept. 10–19, 29, 30, 1932; minimum gage height, 0.65 foot Sept. 1, 15–18, 1929.

REMARKS.—Records good. Discharge estimated Mar. 9–15 because of ice. No record Oct. 1, Oct. 3 to Feb. 8, Feb. 10–28. No regulation or diversions above station except as Round Prairie Creek, which flows into Moyie River Basin, taps Mission Creek at divide 5 miles above gage and diverts a variable flow dependent upon amount of drift that collects at junction of these creeks.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			18	26	117	157	29	6	4
2	* 3		13	33	107	193	26	6	4
3			13	39	119	166	30	5	4
4			13	37	159	155	28	5	4
5			12	33	193	133	24	5	4
6			10	30	255	119	22	5	4
7			11	27	334	114	20	5	4
8			10	25	309	112	18	5	4
9			10	23	309	114	17	5	4
10		* 4	10	25	323	110	16	5	3
11			9	30	309	107	16	6	3
12			9	42	323	104	16	6	3
13			9	77	320	104	14	5	3
14			9	125	320	107	13	5	3
15			9	115	283	100	12	4	3
16			10	105	255	97	12	4	3
17			10	98	249	91	12	4	3
18			10	95	249	72	11	4	3
19			14	91	274	68	11	4	3
20			14	85	283	62	9	4	4
21			13	78	283	58	9	4	4
22			12	81	351	57	8	4	4
23			13	89	303	54	8	4	4
24			14	125	255	49	8	5	4
25			14	107	219	45	8	4	4
26			13	111	196	42	7	4	4
27			13	96	173	39	7	4	4
28			17	102	159	36	6	4	4
29		* 21	19	109	146	33	6	4	3
30			18	117	146	34	6	4	3
31			21		144		6	4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	21	9	12.6	775
April	125	23	72.5	4,310
May	351	107	241	14,800
June	193	33	91.1	5,420
July	30	6	14.0	861
August	6	4	4.6	283
September	4	3	3.6	214
The period				26,700

\* Result of discharge measurement.

## ROCK CREEK NEAR COPELAND, IDAHO

LOCATION.—Staff gage in NW¼ sec. 5, T. 63 N., R. 1 E., at trestle on Kootenai Valley branch of Great Northern Railway 4.7 miles south of Copeland.

DRAINAGE AREA.—14.3 square miles.

RECORDS AVAILABLE.—May 1928 to August 1932 (except winter's).

EXTREMES.—Maximum discharge during year, 67 second-feet Apr. 14 (gage height, 2.50 feet); minimum, 0.1 second-foot Aug. 3, 5-10, 14, 15, 17-19; minimum gage height, 0.31 foot Aug. 18.

1928-32: Maximum discharge, that of Apr. 14, 1932; minimum, 0.1 second-foot July 20 to Sept. 7, 1931, Aug. 3, 5-10, 14, 15, 17-19, 1932.

REMARKS.—Records good except those estimated, Apr. 1, 2, 1½, June 18, Aug. 16, 17, 19-26, 28-31, Sept. 1, 3-5, 7-14, 16-21, 23-27, 29, which are fair. No records Oct. 1-13, 15-27, Oct. 29 to Nov. 9, Nov. 11-18, Nov. 20 to Feb. 28; Mar. 1-9, 11-22, 24, 26-31. No diversions above station.

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

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					30	29	6.2	0.8	0.2	0.2
2					32	27	17	.8	.2	.2
3					34	25	13	1.0	.1	.2
4					29	26	9.6	1.7	.2	.2
5					25	29	8.5	1.4	.1	.2
6					24	26	7.1	1.0	.1	.2
7					21	20	6.7	.9	.1	.2
8					20	17	4.4	.8	.1	.2
9					20	14	5.0	.6	.1	.2
10		0.4		1.7	25	13	4.4	.6	.1	.2
11					29	11	4.1	.5	.2	.2
12					34	10	3.8	.4	.2	.2
13					42	10	3.6	.4	.2	.2
14	0.2				55	8.0	8.1	.4	.1	.2
15					42	6.7	3.1	.4	.1	.2
16					39	5.8	2.8	.3	.2	.2
17					38	5.3	2.7	.3	.1	.2
18					34	5.0	2.5	.3	.1	.2
19		*0.3			33	4.4	2.4	.3	.1	.2
20					30	5.5	2.2	.2	.2	.2
21					28	6.2	2.0	.2	.2	.2
22					27	29	2.0	.2	.2	.2
23				9.8	62	22	2.0	.2	.2	.2
24					47	14	1.8	.2	.2	.2
25				*15	38	12	1.3	.2	.2	.2
26					30	10	1.2	.2	.2	.2
27					28	8.8	1.2	.2	.2	.2
28	*0.2				28	6.7	1.0	.2	.2	.3
29			*16		31	6.2	.9	.2	.2	.3
30					28	6.2	.8	.2	.2	.3
31						5.8		.2	.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
April	62	20	32.8	2.29	2.56	1,950
May	29	4.4	13.7	.958	1.10	842
June	17	.8	4.21	.294	.33	251
July	1.7	.2	.49	.034	.04	30
August	.2	.1	.16	.011	.01	9.8
September	.3	.2	.21	.015	.02	12
The period						3,090

\* Result of discharge measurements.

## BRUSH CREEK NEAR COPELAND, IDAHO

LOCATION.—Staff gage in SE¼ sec. 19, T. 64 N., R. 1 E., at wooden bridge on valley road paralleling Kootenai Valley branch of Great Northern Railway 1.8 miles south of Copeland.

DRAINAGE AREA.—7.2 square miles.

RECORDS AVAILABLE.—May 1923 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 41 second-feet Apr. 23 (gage height, 4.95 feet); no flow Oct. 1–31, July 8 to Aug. 14, Aug. 23 to Sept. 30, 1928–32: Maximum discharge, that of Apr. 23, 1932; no flow June 2, 1929, July 4 to Oct. 31, 1931, July 8 to Aug. 14, Aug. 23 to Sept. 30, 1932.

REMARKS.—Records poor. No records Nov. 1–18, Nov. 20 to Feb. 27, Mar. 1–9, 11–22, 24, 26–31. Discharge estimated Apr. 1–5, 7, 8, May 19–22, July 7, Aug. 15–22. Small amount of water diverted for irrigation from Brush Lake, about 2 miles above gage; some regulation at outlet of Brush Lake.

*Discharge, in second-feet, 1931–32*

Day	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.
1				23	14	4.5	0.1	0
2				25	14	4.5	0.1	0
3				27	13	5.2	0.1	0
4				24	14	7.2	0.1	0
5				22	14	6.0	0.1	0
6				20	16	5.2	0.1	0
7				18	15	4.6	0.1	0
8				17	18	3.4	0	0
9				16	15	3.1	0	0
10			5.4	12	13	2.7	0	0
11				14	12	2.4	0	0
12				15	11	2.2	0	0
13				17	11	1.9	0	0
14				22	10	1.7	0	0
15				23	8.4	1.5	0	0.1
16				22	6.0	1.3	0	0.1
17				13	7.0	1.4	0	0.1
18				18	6.0	1.2	0	0.1
19	* 0.05			18	1.0	1.1	0	0.1
20				15	1.0	1.1	0	0.1
21				13	1.0	.7	0	0.1
22				14	1.0	.8	0	0.1
23			11	41	.9	.8	0	0
24				37	4.3	.7	0	0
25			* 12	30	5.8	.5	0	0
26				20	5.8	.5	0	0
27				19	5.8	.4	0	0
28				18	5.4	.3	0	0
29			* 11	16	5.0	.2	0	0
30				14	4.5	.3	0	0
31					4.1		0	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	41	12	20.1	1,200
May	18	0.9	8.5	525
June	7.2	0.2	2.2	131
July	0.1	0	.02	1.2
August	0.1	0	.03	1.8
The period				1,860

\* Result of discharge measurement.

NOTE.—No flow during October and September.



## PARKER CREEK NEAR COPELAND, IDAHO

LOCATION.—Staff gage in SW¼ sec. 8, T. 64 N., R. 1 W., at Forest Service bridge 4¼ miles west of Copeland.

DRAINAGE AREA.—16.5 square miles.

RECORDS AVAILABLE.—May 1928 to August 1932 (except winters).

EXTREMES.—Maximum discharge during year (estimated), 170 second-feet May 22; minimum, 2 second-feet Oct. 2.

1928-32: Maximum discharge, that of May 22, 1932; minimum, 1 second-foot Sept. 4-6, 1930.

REMARKS.—Records poor. Discharge was estimated on basis of graphical comparison with flow of nearby streams except on Oct. 2, Mar. 14, 24, Apr. 6, 7, 21, May 7, 17-19, 28, June 3, 4, 8, 9, 18, 29, July 7, 11, 15, 21, Aug. 5, 8, when gage was read or discharge measurement made. No records Oct. 1, Oct. 3 to Mar. 13. No diversions above station.

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

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....			* 27	* 58	* 90	* 46		
2.....	2		* 35	* 64	* 92	* 42	* 6	
3.....			* 35	* 66	107	* 40		
4.....			* 32	* 72	107	* 37		
5.....			* 31	* 76	* 100	* 35	6	
6.....			30	* 80	* 97	* 30	* 6	
7.....			29	95	* 100	25	* 6	
8.....			* 24	* 125	105	* 23	6	
9.....			* 23	* 138	109	* 21		
10.....			* 23	* 143	* 110	* 20		
11.....			* 27	* 146	* 110	* 18	* 5	
12.....			* 33	* 155	* 125	* 17		
13.....			* 83	* 145	* 125	* 15		
14.....		17	* 83	* 140	* 140	* 13		
15.....		* 15	* 84	* 134	* 120	12		
16.....			* 15	* 85	* 130	* 107	* 11	* 3
17.....			* 14	* 80	126	* 105	* 10	
18.....			* 13	* 76	124	99	* 10	
19.....			* 13	* 69	132	* 88	* 9	
20.....			* 14	* 62	* 139	* 87	* 8	
21.....			* 15	56	* 154	* 89	8	
22.....			* 15	* 56	* 170	* 85	* 8	
23.....			* 14	* 62	* 157	* 85		
24.....			15	* 66	* 120	* 77		
25.....			* 16	* 64	* 105	* 68		
26.....			* 15	* 59	* 95	* 65		
27.....			* 15	* 49	* 92	* 60		
28.....			* 16	* 51	89	* 60		
29.....			* 18	* 55	* 85	51		
30.....			* 18	* 56	* 82	* 48	* 6	
31.....			* 19		* 85			

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
March 14-31.....	19	13	15.4	0.933	0.62	550
April.....	85	23	51.5	3.12	3.48	3,060
May.....	170	58	114	6.91	7.97	7,010
June.....	140	48	93.7	5.68	6.34	5,580
July.....	46		16.7	1.01	1.16	1,030
August.....			4.7	.285	.33	289
September.....			3.0	.182	.20	179
The period.....						17,700

\* Estimated.

## LONG CANYON CREEK NEAR PORT HILL, IDAHO

**LOCATION.**—Water-stage recorder in NW¼ sec. 36, T. 65 N., R. 2 W., on Forest Service bridge at mouth of canyon 4 miles southwest of Port Hill.

**DRAINAGE AREA.**—29 square miles.

**RECORDS AVAILABLE.**—May 1928 to September 1932 (except winters).

**EXTREMES.**—Maximum discharge during year, 538 second-feet May 20; maximum gage height, 4.24 feet May 9; minimum discharge, 6 second-feet Sept. 13-18, 27-30; minimum gage height, 0.94 foot Oct. 19.

1928-32: Maximum discharge, 598 second-feet May 14, 1931; maximum gage height, that of May 9, 1932; minimum discharge, 4.2 second-feet Nov. 8, 1930 (gage height, 0.91 foot).

**REMARKS.**—Records good except those for Mar. 2 to May 15 and those estimated, Oct. 21 to Nov. 13, Nov. 20, which are fair. Discharge interpolated Sept. 11-14. No diversions above gage. No records Nov. 21 to Mar. 1.

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

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7	15		78	116	229	98	17	10
2	7		54	85	116	284	90	16	10
3	7		51	86	119	276	97	15	8
4	7		46	82	135	257	95	15	8
5	8		42	79	161	236	90	14	8
6	9	11	40	76	215	226	71	13	8
7	8		39	73	280	246	63	13	8
8	8		38	72	318	272	58	12	7
9	8		37	70	362	284	52	12	7
10	7		37	69	378	292	50	12	7
11	7	13	36	71	384	304	46	15	7
12	7		35	82	412	314	44	17	7
13	7		34	102	412	327	41	13	6
14	7		34	125	400	327	39	12	6
15	7		33	125	350	296	36	12	6
16	7	13	32	124	332	276	35	11	6
17	7		31	127	340	257	34	10	6
18	7		33	124	350	229	33	10	6
19	7		42	118	356	218	31	10	7
20	7		38	113	436	206	30	10	8
21		13	36	108	394	226	28	10	8
22			36	109	394	223	27	10	7
23			36	122	322	206	26	10	7
24			36	118	288	186	24	9	7
25			37	113	253	164	23	9	7
26		13	36	111	220	146	22	9	7
27			35	109	201	133	21	9	6
28			40	109	181	127	20	8	6
29			42	112	179	118	19	8	6
30			40	113	181	109	18	9	6
31			59		204		18	9	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October		7	9.3	0.321	0.37	572
November 1-20			13.7	.472	.35	543
March 2-31	59	31	38.8	1.34	1.50	2,310
April	127	69	100	3.45	3.85	5,950
May	436	116	284	9.79	11.29	17,500
June	327	109	233	8.08	8.96	13,900
July	98	18	44.5	1.53	1.76	2,740
August	17	8	11.6	.400	.46	713
September	10	6	7.1	.245	.27	422

• Result of discharge measurement.

## SMITH CREEK NEAR PORT HILL, IDAHO

LOCATION.—Water-stage recorder in NE¼ sec. 26, T. 65 N., R. 2 W., at Forest Service bridge 1 mile south of Smith Creek ranger station and 4 miles southwest of Port Hill.

DRAINAGE AREA.—70 square miles.

RECORDS AVAILABLE.—May 1928 to September 1932 (except winters).

EXTREMES.—Maximum discharge during year, 1,490 second-feet May 20 (gage height, 5.58 feet); minimum discharge, 8 second-feet Sept. 13–18; minimum gage height, 0.91 foot Oct. 3.

1928–32: Maximum discharge, 1,560 second-feet May 14, 1931; maximum gage height, that of May 20, 1932; minimum discharge, 5.5 second-feet Sept. 15–18, 1929; minimum gage height, 0.80 foot Sept. 15–18, 1929, Sept. 10, 1930.

REMARKS.—Records excellent below 900 second-feet; others good except those for December to February, which are poor. Discharge estimated Oct. 10–23, Nov. 20 to Dec. 8, Dec. 10 to Mar. 1, Mar. 9–13, July 6–14. No diversions above gage.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	24				300	227	434	860	227	28	18
2	10	57				229	225	402	1,090	203	26	19
3	9	43				207	222	463	888	253	25	14
4	10	35				182	201	620	805	251	23	13
5	14	29	25			167	182	805	695	271	22	12
6	20	33				154	166	942	695	245	21	11
7	15	90				133	155	1,030	805	205	20	11
8	13	64				117	147	1,120	800	180	19	10
9	12	50	25			115	142	1,120	915	155	18	9
10		45		19	17	113	144	1,210	970	135	18	9
11		39				111	159	1,120	970	125	28	9
12		35				108	195	1,120	1,000	105	46	9
13		39				109	201	1,280	1,030	90	29	8
14		37				108	458	1,090	1,030	86	24	8
15		36				103	421	860	888	76	21	8
16	11	35				97	394	888	778	73	19	8
17		33				95	405	970	722	72	20	8
18		31	25			108	375	1,000	645	67	18	8
19		28				147	358	1,090	595	80	16	9
20		23				134	321	1,380	580	55	16	16
21						121	288	1,210	645	51	16	14
22	30				19	114	299	1,210	620	49	16	12
23	50					111	383	970	560	46	16	11
24	24					114	350	778	498	43	15	11
25	22			17		115	327	620	425	41	14	12
26	28					107	318	545	390	39	13	12
27	24				900	102	324	522	340	36	13	10
28	20					118	358	536	318	34	12	9
29	22					126	386	565	294	31	11	9
30	20					121	409	620	261	30	14	9
31	20					183		778		28	16	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acro-feet
October	50	9	16.3	0.233	0.27	1,000
November	90		35.5	.507	.57	2,110
December			24.4	.349	.40	1,500
January			18.2	.260	.30	1,120
February			139	1.99	2.15	8,000
March	300	95	134	1.91	2.20	8,240
April	453	142	288	4.11	4.59	17,100
May	1,380	402	881	12.6	14.53	54,200
June	1,090	261	706	10.1	11.27	42,000
July	271	28	108	1.54	1.78	6,640
August	46	11	19.8	.283	.33	1,220
September	19	8	10.9	.156	.17	649
The year	1,380	8	198	2.83	38.56	144,000

## UPPER COLUMBIA RIVER BASIN

103

## BOUNDARY CREEK NEAR PORT HILL, IDAHO

(International gaging station)

**LOCATION.**—Water-stage recorder in SW $\frac{1}{4}$  sec. 11, T. 65 N., R. 2 W., 140 feet below bridge at mouth of canyon, a fifth of a mile south of international boundary, and 3 miles west of Port Hill.

**DRAINAGE AREA.**—97 square miles.

**RECORDS AVAILABLE.**—May 1928 to September 1932.

**EXTREMES.**—Maximum discharge during year, 1,680 second-feet May 2<sup>7</sup> (gage height, 4.44 feet); minimum, 14 second-feet Oct. 18–20 (gage height, 0.56 foot).

1928–32: Maximum discharge, that of May 20, 1932; minimum, 9 second-feet Oct. 31, 1929 (gage height, 0.33 foot).

**REMARKS.**—Records good except those estimated, Oct. 1, 2, Nov. 21 to Mar. 3, Mar. 9–18, Sept. 2–14, 24–27, which are fair. No diversions above gage. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	15	29				250	189	535	918	218	34	24
2.....	16	53				125	204	510	1,200	192	32	22
3.....	16	38				120	206	575	1,060	240	31	21
4.....	16	35				117	189	724	950	218	30	21
5.....	20	29				113	171	950	820	201	29	19
6.....	23	33				105	158	1,060	760	163	28	19
7.....	20	77		22		90	152	1,160	820	145	27	
8.....	18	57				81	145	1,230	918	132	27	
9.....	18	44					140	1,270	985	117	25	
10.....	17	39			18		145	1,390	1,060	108	25	16
11.....	16	33				77	158	1,270	1,020	100	34	
12.....	16	33					206	1,230	1,060	94	48	
13.....	16	33	28				324	1,390	1,060	87	35	
14.....	16	34					472	1,270	1,060	82	31	15
15.....	15	33					463	1,020	950	78	28	15
16.....	15	33		18		72	445	985	862	75	26	15
17.....	15	32					454	1,060	790	73	28	15
18.....	14	30				80	422	1,090	678	73	26	15
19.....	14	33	18			97	414	1,120	640	66	24	16
20.....	14	25				96	388	1,510	606	60	24	20
21.....	15					90	348	1,470	623	56	24	21
22.....	29				20	85	368	1,550	628	53	23	20
23.....	57					88	468	1,230	575	49	29	16
24.....	34					87	454	985	500	46	26	
25.....	29	28		18		90	436	820	436	44	24	16
26.....	31		26			88	432	694	384	41	23	
27.....	29				900	87	432	645	348	39	22	
28.....	26					96	463	656	320	38	21	16
29.....	25		26			103	490	684	292	36	21	16
30.....	24	30				103	515	742	250	35	25	16
31.....	26					138		885		35	25	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	57	14	21.1	0.218	0.25	1,300
November.....	77		34.5	.356	.40	2,050
December.....			27.6	.285	.33	1,700
January.....			19.8	.204	.24	1,220
February.....			140	1.44	1.55	8,050
March.....	250		97.0	1.00	1.15	5,960
April.....	515	140	328	3.38	3.77	19,500
May.....	1,550	510	1,020	10.5	12.11	62,700
June.....	1,200	250	754	7.77	8.67	44,900
July.....	240	35	96.6	.996	1.15	5,940
August.....	48	21	27.6	.285	.33	1,700
September.....	24	15	17.3	.178	.20	1,030
The year.....	1,550	14	215	2.22	30.15	156,000

\* Result of discharge measurement.

## CLARK FORK BASIN

## CLARK FORK ABOVE MISSOULA, MONT.

LOCATION.—Water-stage recorder in SE¼ sec. 19, T. 13 N., R. 18 W., 1½ miles below mouth of Blackfoot River and 4 miles east of Missoula.

RECORDS AVAILABLE.—March 1929 to September 1932.

EXTREMES.—Maximum discharge, 12,800 second-feet May 14 (gage height, 7.65 feet); minimum occurred during winter.

1929-32: Maximum discharge, that of May 14, 1932; minimum, 86 second-feet Jan. 8, 1930 (gage height, 0.52 foot; ice jammed above gage).

REMARKS.—Records good. No records Nov. 23 to Mar. 15. Discharge interpolated Sept. 13-16. Several diversions for irrigation above station.

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

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	990	971	-----	1,810	2,790	5,450	3,400	1,380	1,040
2	962	1,000	-----	2,140	2,720	6,200	3,160	1,320	1,040
3	971	990	-----	2,210	2,860	6,460	2,860	1,210	990
4	971	1,010	-----	2,070	3,480	6,200	2,790	1,260	990
5	962	990	-----	2,070	4,280	6,070	2,860	1,200	990
6	-----	942	-----	1,810	4,570	6,600	2,560	1,110	990
7	-----	924	1,010	1,810	4,880	6,740	2,490	1,090	990
8	-----	914	1,030	1,810	5,100	6,870	2,350	1,200	990
9	-----	886	990	1,810	5,570	7,140	2,210	1,090	895
10	-----	924	1,010	1,740	6,330	7,140	2,070	942	895
11	-----	859	1,010	1,810	7,410	7,410	2,000	1,090	895
12	-----	886	980	1,880	8,250	7,410	1,940	1,110	895
13	-----	886	980	2,070	9,710	7,690	1,940	1,090	892
14	-----	924	990	2,350	11,500	7,970	1,940	1,090	888
15	-----	924	990	2,720	11,600	7,970	1,940	1,090	884
16	-----	895	1,050	1,300	2,640	9,120	1,940	1,040	880
17	-----	895	1,070	1,260	2,860	9,120	10,000	1,880	877
18	-----	895	1,070	1,340	3,020	8,540	9,120	1,880	828
19	-----	933	1,030	1,740	3,020	8,540	7,970	1,810	877
20	-----	886	1,010	2,350	3,090	9,120	7,410	1,940	877
21	-----	904	771	2,210	3,090	10,600	6,600	2,070	990
22	-----	904	720	1,940	2,940	12,200	6,200	2,210	990
23	-----	952	-----	1,740	3,020	11,900	6,070	1,940	990
24	-----	971	-----	1,680	3,090	10,000	5,820	1,880	990
25	-----	971	-----	1,680	3,020	8,540	5,330	1,880	990
26	-----	962	-----	1,620	2,940	7,410	4,880	1,940	990
27	-----	852	-----	1,440	2,860	6,740	4,670	1,180	942
28	-----	1,000	-----	1,440	2,860	6,330	4,180	1,560	942
29	-----	1,030	-----	1,620	2,860	5,820	3,910	1,500	942
30	-----	971	-----	1,680	2,860	6,200	3,400	1,440	942
31	-----	980	-----	1,620	-----	6,460	-----	1,440	942

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,030	859	936	57,600
November 1-22	1,070	720	985	43,000
March 16-31	2,350	1,260	1,670	53,000
April	3,090	1,740	2,480	148,000
May	12,200	2,720	7,370	453,000
June	10,000	3,400	6,600	393,000
July	3,400	1,180	2,100	129,000
August	1,380	942	1,070	65,800
September	1,140	762	915	54,400

## CLARK FORK BELOW MISSOULA, MONT.

LOCATION.—Water-stage recorder in SE¼ sec. 21, T. 13 N., R. 20 W., 2 miles below mouth of Bitterroot River and 6 miles west of Missoula.

RECORDS AVAILABLE.—October 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 24,400 second-feet May 23 (gage height, 8.12 feet); minimum, 718 second-feet Dec. 15 (gage height, 0.61 foot).

1929-32: Maximum discharge, 24,400 second-feet May 23, 193<sup>1</sup> (gage height, 8.12 feet); minimum, 513 second-feet Sept. 5, 1931 (gage height, 0.47 foot).

REMARKS.—Records excellent except those for Jan. 26 to Mar. 22, which are good. Numerous diversions above station.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,660	1,540	1,090	1,420	1,050	3,140	2,650	5,080	11,700	8,280	2,290	1,690
2	1,680	1,540	1,070	1,440	1,050	2,840	3,040	5,080	12,100	7,450	2,120	1,760
3	1,660	1,540	1,040	1,510	1,070	2,470	3,250	5,380	12,400	7,130	2,120	1,730
4	1,660	1,540	1,220	1,460	1,050	2,200	3,250	6,650	12,100	6,170	1,950	1,630
5	1,630	1,540	1,640	1,490	1,050	2,120	3,250	8,790	12,100	6,650	1,870	1,710
6	1,590	1,580	1,750	1,490	1,440	2,120	3,040	9,500	13,200	6,010	1,790	1,600
7	1,590	1,630	1,720	1,560	1,370	2,120	2,940	10,200	13,200	5,530	1,710	1,560
8	1,590	1,630	1,720	1,580	1,440	1,790	2,940	11,000	14,000	4,940	1,710	1,510
9	1,630	1,680	1,720	1,610	1,510	1,760	2,940	12,400	14,400	4,660	1,630	1,490
10	1,680	1,580	1,640	1,680	1,610	1,760	2,840	14,000	15,200	4,150	1,510	1,410
11	1,660	1,680	1,580	1,720	1,470	1,730	2,840	15,600	15,200	3,910	1,660	1,400
12	1,580	1,630	1,560	1,810	1,440	1,600	3,040	17,600	15,600	3,910	1,660	1,340
13	1,540	1,580	1,460	1,340	1,220	1,850	3,460	19,700	16,400	3,800	1,760	1,340
14	1,580	1,580	1,130	1,160	1,090	1,950	4,280	21,800	17,200	3,910	1,760	1,340
15	1,540	1,540	920	1,120	1,000	2,020	5,230	23,600	18,000	4,030	1,790	1,340
16	1,540	1,580	910	1,140	1,000	2,290	5,380	21,400	19,300	3,910	1,660	1,410
17	1,510	1,720	1,160	1,300	980	2,200	5,530	18,400	20,500	3,680	1,630	1,290
18	1,490	1,720	1,510	1,460	960	2,380	5,530	17,200	19,300	3,680	1,660	1,210
19	1,470	1,720	1,750	1,490	940	2,740	5,080	17,600	16,800	3,460	1,600	1,280
20	1,460	1,720	1,810	1,610	1,370	3,570	5,530	18,900	15,600	3,680	1,480	1,410
21	1,460	1,630	1,790	1,540	1,610	3,460	5,380	21,400	14,800	3,910	1,400	1,340
22	1,400	1,190	1,810	1,540	1,610	3,140	5,080	23,600	14,000	3,910	1,480	1,370
23	1,460	980	1,750	1,320	1,680	2,840	5,080	24,000	14,400	3,680	1,520	1,380
24	1,540	940	1,720	1,160	1,790	2,650	5,080	20,500	14,800	3,460	1,480	1,510
25	1,540	1,160	1,720	1,090	2,020	2,650	4,940	17,200	14,400	3,250	1,480	1,600
26	1,540	1,340	1,720	1,090	2,820	2,560	4,660	14,800	12,800	3,680	1,420	1,600
27	1,540	1,460	1,680	1,370	3,600	2,380	4,660	13,200	12,100	2,470	1,440	1,630
28	1,540	1,220	1,700	1,640	4,060	2,290	4,940	12,400	10,600	2,650	1,370	1,630
29	1,540	1,250	1,750	1,310	4,180	2,470	5,080	11,700	9,500	2,560	1,450	1,600
30	1,540	1,180	1,610	1,070	-----	2,470	5,230	12,100	8,790	2,470	1,450	1,630
31	1,540	-----	1,340	1,050	-----	2,470	-----	12,100	-----	2,290	1,480	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,680	1,400	1,560	95,900
November	1,720	940	1,490	88,700
December	1,810	910	1,520	93,500
January	1,810	1,050	1,410	86,700
February	4,180	940	1,640	94,300
March	3,570	1,600	2,390	147,000
April	5,850	2,650	4,230	252,000
May	24,000	5,080	14,900	916,000
June	20,500	8,790	14,300	851,000
July	8,280	2,290	4,300	264,000
August	2,290	1,370	1,660	102,000
September	1,760	1,210	1,490	88,700
The year	24,000	910	4,250	3,080,000

## CLARK FORK AT ST. REGIS, MONT.

LOCATION.—Staff gage in sec. 19, T. 18 N., R. 27 W., at St. Regis, half a mile below mouth of St. Regis River.

DRAINAGE AREA.—10,500 square miles.

RECORDS AVAILABLE.—October 1910 to September 1923; February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 32,700 second-feet June 23 (gage height, 13.70 feet); minimum, 1,430 second-feet Nov. 25 and Feb. 1 (gage height, 3.70 feet, ice affected).

1910–23, 1929–32: Maximum discharge, 62,800 second-feet May 20–31, 1913 (gage height, 19.1 feet); minimum, 1,050 second-feet Feb. 19–22, 1929; ice on control.

REMARKS.—Records good except those for periods of ice effect, Nov. 22 to Feb. 25, Mar. 1–19, 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.....	1,990	*1,990	1,600	*2,030	1,430	4,480	5,260	9,450	13,200	10,800	3,280	2,210
2.....	1,990	1,990	1,520	*1,960	1,520	4,120	5,680	9,450	17,000	10,200	3,280	2,440
3.....	1,990	1,990	1,520	1,890	1,520	3,610	5,900	9,970	17,300	9,700	2,980	2,440
4.....	1,990	1,990	1,790	1,890	1,790	*3,160	6,120	12,000	17,000	9,320	2,980	2,320
5.....	1,990	1,990	2,100	1,990	1,990	2,700	5,900	15,200	16,600	8,950	2,980	2,320
6.....	*1,990	1,990	2,210	2,100	2,100	2,700	5,470	15,900	16,600	8,200	2,700	2,210
7.....	1,990	1,990	*2,260	2,210	2,100	2,700	5,260	17,000	17,300	6,780	2,570	2,210
8.....	1,990	2,100	2,320	2,440	2,100	2,700	5,260	18,800	17,700	6,560	2,440	2,210
9.....	1,990	2,210	2,210	2,440	1,990	2,320	5,050	19,500	18,400	6,340	2,700	2,210
10.....	1,990	2,210	2,210	2,320	1,890	2,320	5,050	21,800	19,200	6,340	2,570	2,100
11.....	1,990	2,210	2,100	2,320	1,790	2,210	5,470	23,400	19,500	5,680	2,570	2,210
12.....	1,990	2,100	2,100	2,210	1,700	1,990	5,900	25,000	20,300	5,680	*2,570	2,210
13.....	1,990	2,100	1,990	2,100	1,700	2,210	7,000	27,600	21,000	5,470	2,570	2,100
14.....	1,990	*2,100	1,890	1,990	1,700	2,210	8,200	31,300	21,800	5,470	2,570	*2,100
15.....	1,990	2,100	1,790	1,790	1,600	2,210	8,950	32,300	22,600	5,470	2,570	2,100
16.....	1,990	1,990	1,790	1,700	1,600	2,700	9,450	31,300	23,400	5,470	2,440	1,990
17.....	1,990	1,990	*1,940	1,600	1,520	2,840	10,200	26,800	24,600	5,470	2,440	1,990
18.....	1,990	2,100	2,100	1,790	1,600	2,840	10,800	25,000	25,000	5,050	2,440	1,990
19.....	1,990	2,100	2,570	1,890	1,700	3,610	10,200	24,200	*22,600	5,050	2,440	1,990
20.....	1,990	2,210	2,700	*1,840	1,790	4,300	9,200	25,800	20,300	4,850	2,320	1,990
21.....	1,990	1,990	2,700	1,790	1,890	4,480	8,450	28,600	18,800	5,050	2,570	2,210
22.....	1,990	1,600	2,570	1,790	1,990	4,660	8,200	32,300	18,000	5,050	*2,390	2,210
23.....	1,990	1,520	2,440	1,700	1,890	4,300	8,200	32,700	17,700	4,850	2,210	2,210
24.....	1,990	*1,480	2,440	1,600	1,990	4,120	7,960	28,600	17,300	*4,660	2,440	2,320
25.....	1,990	1,430	*2,380	1,520	2,210	4,120	*8,060	24,200	17,000	4,480	2,440	2,210
26.....	1,990	1,600	2,320	1,600	2,440	4,120	8,200	21,000	17,000	4,480	2,210	2,210
27.....	1,990	1,890	2,440	1,790	3,950	3,950	8,450	18,800	16,600	4,300	2,100	2,210
28.....	1,990	1,890	2,320	1,890	5,260	3,950	8,700	17,000	13,500	3,950	2,210	2,100
29.....	1,990	1,700	2,320	1,790	*5,050	3,950	*8,960	*16,400	12,300	3,610	2,100	2,100
30.....	1,990	1,700	2,210	1,600	4,120	4,120	9,200	15,900	11,700	3,610	2,100	2,100
31.....	1,990	-----	2,100	1,520	-----	4,300	-----	16,200	-----	3,280	2,100	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,990	1,990	1,990	122,000
November.....	2,210	1,430	1,940	115,000
December.....	2,700	1,520	2,160	133,000
January.....	2,440	1,520	2,190	117,000
February.....	5,260	1,430	2,130	123,000
March.....	4,660	1,990	3,350	206,000
April.....	10,800	5,050	7,490	448,000
May.....	32,700	9,450	24,700	1,330,000
June.....	25,000	11,700	18,300	1,090,000
July.....	10,800	3,280	5,940	365,000
August.....	3,280	2,100	2,570	156,000
September.....	2,440	1,990	2,170	129,000
The year.....	32,700	1,430	5,980	4,330,000

\* Interpolated.

## CLARK FORK NEAR PLAINS, MONT.

LOCATION.—Water-stage recorder on lot 7, sec. 7, T. 19 N., R. 26 W., 3 miles above Plains and 7 miles below mouth of Flathead River.

DRAINAGE AREA.—19,900 square miles.

RECORDS AVAILABLE.—October 1910 to September 1932.

EXTREMES.—Maximum discharge during year, 83,600 second-feet May 23 (gauge height, 14.53 feet); minimum, 3,920 second-feet Jan. 25 (gauge height, 3.38 feet, ice-affected).

1910-32: Maximum discharge, 126,000 second-feet May 28, 1923; minimum, 3,860 second-feet Jan. 18, 1930.

REMARKS.—Records good except those for Dec. 1 to Mar. 12, which are fair. Numerous diversions for irrigation above station. Flow somewhat regulated by natural storage in Flathead Lake.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	4,960	4,750	4,460	4,550	4,460	8,020	10,700	28,700	62,600	51,600	16,100	8,670
2.....	4,960	4,750	4,460	4,650	4,370	7,810	11,500	28,700	62,600	49,900	15,600	8,670
3.....	4,860	4,750	4,650	4,750	4,960	7,200	12,400	29,400	63,500	47,300	15,000	8,900
4.....	4,860	4,750	4,550	4,750	5,420	6,640	12,400	30,100	63,500	45,600	15,000	8,900
5.....	4,860	4,750	4,750	4,750	5,840	6,470	13,000	33,700	63,500	43,900	14,500	8,670
6.....	4,600	4,750	4,860	4,650	5,840	6,300	13,000	36,700	63,500	43,000	14,000	8,670
7.....	4,860	4,750	4,960	4,550	5,420	6,300	12,400	39,000	63,500	41,400	14,000	8,670
8.....	4,750	4,750	4,960	4,750	5,690	6,140	12,400	40,600	63,500	39,800	13,500	8,450
9.....	4,750	4,860	4,960	4,650	5,300	5,560	13,000	43,900	63,500	38,200	13,000	8,020
10.....	4,750	4,750	4,860	4,860	4,960	5,420	13,000	48,100	64,400	36,700	12,400	8,020
11.....	4,750	4,750	4,750	4,860	4,960	5,420	13,500	51,600	64,400	35,200	12,400	7,810
12.....	4,750	4,860	4,750	4,750	5,180	5,990	14,000	56,100	64,400	33,700	12,400	7,600
13.....	4,750	4,860	4,650	4,550	5,070	8,020	15,000	61,600	65,400	32,300	12,000	7,600
14.....	4,750	4,860	4,550	4,050	5,180	7,810	16,700	67,300	66,400	31,600	12,000	7,400
15.....	4,750	4,860	4,550	4,120	5,070	8,020	18,400	71,200	67,300	30,100	12,000	7,200
16.....	4,750	4,860	4,550	4,370	5,650	7,810	20,100	74,200	68,300	29,400	11,700	7,200
17.....	4,750	4,860	4,750	4,550	4,750	8,020	21,400	72,200	70,200	28,700	11,500	7,010
18.....	4,750	4,960	4,860	4,550	4,960	8,240	22,700	70,200	71,200	27,400	11,200	6,820
19.....	4,750	4,960	5,180	4,550	4,860	9,120	23,300	70,200	70,200	26,000	10,700	6,470
20.....	4,750	4,860	5,180	4,550	4,650	10,300	24,700	71,200	67,300	25,300	10,500	6,640
21.....	4,750	4,960	5,300	4,750	4,650	10,700	25,300	74,200	66,400	24,700	10,300	6,640
22.....	4,750	4,550	5,420	4,550	4,650	10,700	25,300	79,300	64,400	24,000	10,500	6,820
23.....	4,750	4,550	5,420	4,370	4,860	10,500	26,000	82,500	63,500	23,300	10,300	6,820
24.....	4,550	4,550	5,420	4,280	4,860	10,300	26,700	83,600	63,500	22,700	9,810	6,820
25.....	4,650	4,460	5,420	4,200	4,960	10,300	26,700	79,300	63,500	21,400	9,810	6,820
26.....	4,750	4,860	5,300	4,370	5,690	10,000	27,400	76,200	62,600	20,800	9,580	6,820
27.....	4,750	4,750	5,180	4,370	6,640	9,810	27,400	73,200	60,700	20,800	9,580	6,640
28.....	4,650	4,650	5,300	4,370	7,010	9,810	28,000	70,200	57,900	18,900	9,350	6,640
29.....	4,750	4,650	4,960	4,650	7,400	10,000	28,700	67,300	56,100	18,400	9,120	6,470
30.....	4,750	4,650	4,960	4,550	-----	10,300	28,700	65,400	53,400	17,800	8,670	6,470
31.....	4,750	-----	4,960	4,460	-----	10,300	-----	63,500	-----	17,200	8,670	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	4,960	4,550	4,760	293,000
November.....	4,960	4,460	4,760	283,000
December.....	5,420	4,460	4,930	303,000
January.....	4,860	4,050	4,640	279,000
February.....	7,400	4,460	5,290	304,000
March.....	10,700	5,420	8,300	510,000
April.....	28,700	10,700	19,500	1,160,000
May.....	83,600	28,700	59,300	3,650,000
June.....	71,200	53,400	64,000	3,810,000
July.....	51,600	17,200	31,200	1,920,000
August.....	16,100	8,670	11,800	726,000
September.....	8,900	6,470	7,480	445,000
The year.....	83,600	4,050	18,800	13,700,000



## CLARK FORK NEAR HERON, MONT.

LOCATION.—Water-stage recorder in sec. 28, T. 27 N., R. 34 W., 600 feet above Dead Horse Creek and 1½ miles northwest of Heron.

RECORDS AVAILABLE.—September 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 95,400 second-feet May 24 (gage height, 36.68 feet); minimum, 3,250 second-feet Nov. 1 (gage height, 8.86 feet). A lesser discharge may have occurred during period Jan. 24 to Feb. 20.

1928-32: Maximum discharge, that of May 24, 1932; minimum, 1,640 second-feet as measured Jan. 13, 1930, during period of ice effect (gage height, 8.81 feet).

Maximum stage known, 59.1 feet June 1894.

REMARKS.—Records excellent except those estimated, Jan. 24 to Feb. 19, Feb. 24, July 10, 12, 14, which are good. Power plant operation at Thompson Falls causes considerable diurnal fluctuation during low-water periods. Considerable water diverted for irrigation from tributaries upstream.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	6,370	4,820	4,140	5,560	5,600	13,900	15,100	35,300	68,900	56,800	19,600	9,780
2-----	5,880	5,260	5,560	6,710		12,900	16,900	35,600	69,700	54,900	18,500	9,780
3-----	5,880	5,110	5,410	5,110	6,000	12,000	17,700	36,000	70,500	52,900	18,000	9,780
4-----	5,260	5,560	5,260	4,820		11,100	18,200	38,800	70,900	51,800	17,400	9,780
5-----	5,410	7,790	5,560	5,410		10,600	18,000	42,700	70,900	49,500	16,600	9,570
6-----	5,560	4,540	6,040	5,410	5,700	10,400	17,460	47,200	70,100	48,300	16,100	9,780
7-----	5,880	7,420	5,410	5,560		10,600	16,900	49,800	70,100	47,200	16,100	9,570
8-----	5,880	4,680	5,880	5,560		9,570	16,900	52,600	69,700	48,300	15,100	9,360
9-----	7,600	4,140	6,200	5,720		9,990	16,900	55,700	70,100	43,800	14,400	9,160
10-----	6,200	4,960	6,040	6,040		9,160	16,900	58,800	70,500	42,400	13,600	8,760
11-----	5,720	6,040	6,040	5,880	5,400	8,560	17,700	62,800	70,900	40,600	12,700	8,760
12-----	5,260	5,720	5,720	6,200		8,560	20,500	66,000	71,400	39,100	14,100	8,760
13-----	5,560	5,720	5,720	6,370		8,560	23,100	71,400	71,800	37,400	13,900	8,360
14-----	5,260	6,040	5,880	5,880		8,960	25,200	78,600	73,000	35,600	13,600	8,360
15-----	5,720	5,110	4,960	5,410		9,570	27,400	83,000	74,700	34,600	13,600	8,170
16-----	5,880	6,200	5,110	4,680	5,400	9,780	28,300	84,800	78,000	33,600	13,600	7,420
17-----	5,880	5,880	5,260	4,680		9,570	28,300	84,400	77,300	32,200	13,100	7,980
18-----	5,880	5,560	5,410	5,110		9,990	28,600	81,700	78,600	31,600	12,700	7,980
19-----	5,410	6,040	4,820	5,880		11,100	29,900	80,400	78,600	30,200	12,400	7,600
20-----	5,560	6,540	4,820	5,720		12,700	30,600	81,200	76,000	28,300	12,200	7,420
21-----	5,560	5,880	5,410	5,880	5,300	13,400	30,600	85,200	73,500	28,300	12,000	7,600
22-----	5,880	6,040	5,720	5,880		4,680	13,900	30,600	90,700	27,700	12,000	7,600
23-----	5,560	4,960	5,880	5,880		5,410	14,100	30,600	94,400	27,000	11,700	7,600
24-----	5,720	4,540	6,040			5,500	13,400	30,900	94,900	26,400	11,500	7,600
25-----	6,200	5,110	5,560			5,720	13,600	31,200	87,500	25,200	11,300	7,600
26-----	5,260	4,820	5,720		5,600	7,060	13,400	31,900	87,000	24,300	11,500	7,600
27-----	4,680	4,960	5,880			10,400	13,100	33,200	82,100	23,400	10,800	7,600
28-----	5,110	4,960	5,880			14,100	13,100	33,600	78,200	22,800	10,800	7,600
29-----	5,260	4,960	5,880			14,400	13,600	34,200	74,700	21,600	10,600	7,420
30-----	5,410	4,270	5,880				13,900	34,600	72,200	20,700	10,200	7,420
31-----	5,260		5,720				14,100		70,100	20,200	9,780	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	7,600	4,680	5,680	349,000
November-----	7,790	4,140	5,450	324,000
December-----	6,200	4,140	5,570	342,000
January-----			5,560	342,000
February-----	14,400		6,330	364,000
March-----	14,100	8,560	11,500	707,000
April-----	34,600	15,100	25,100	1,490,000
May-----	94,900	35,300	69,200	4,250,000
June-----	78,600	59,200	70,800	4,210,000
July-----	56,800	20,200	35,600	2,190,000
August-----	19,600	9,780	13,500	830,000
September-----	9,780	7,420	8,390	499,000
The year-----	94,900		21,900	15,900,000

\* Result of discharge measurement.

## PEND ORRILLE LAKE AT HOPE, IDAHO

LOCATION.—Water-stage recorder in lot 2, sec. 35, T. 57 N., R. 1 E., at floating dock near Northern Pacific Railway station at Hope. Zero of gage is 2,000.00 feet above mean sea level, United States Coast and Geodetic Survey datum.

DRAINAGE AREA.—22,903 square miles.

RECORDS AVAILABLE.—September 1921 to September 1932; March 1914 to September 1922 at Sandpoint.

EXTREMES.—Maximum water-surface elevation during year, 2,062.89 feet May 26; minimum, 2,046.72 feet Dec. 5.

1921-32: Maximum water-surface elevation, 2,068.67 feet May 31, June 1, 1928; minimum, 2,046.59 feet Jan. 28, 1930.

Maximum known water-surface elevation, 2,076.08 feet June 1894.

REMARKS.—Records good. Considerable water diverted from tributaries of Clark Fork for irrigation.

*Gage height, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47.05	46.90	46.80	47.06	47.09	48.31	49.98	54.16	61.99	59.62	51.92	48.67
2	47.06	46.90	46.76	47.05	47.10	48.52	50.10	54.29	61.89	59.34	51.72	48.60
3	47.05	46.88	46.74	47.06	47.11	48.68	50.30	54.41	61.80	59.12	51.53	48.55
4	47.04	46.85	46.73	47.03	47.10	48.73	50.47	54.53	61.72	58.84	51.37	48.50
5	47.05	46.87	46.72	47.02	47.08	48.82	50.60	54.72	61.63	58.55	51.22	48.46
6	47.04	46.90	46.73	47.01	47.06	48.87	50.71	54.98	61.52	58.24	51.06	48.41
7	47.02	46.95	46.75	47.00	47.06	48.85	50.77	55.30	61.40	57.97	50.90	48.38
8	47.01	47.00	46.78	46.99	47.08	48.83	50.81	55.66	61.30	57.69	50.76	48.38
9	47.02	46.99	46.80	47.02	47.08	48.77	50.82	56.05	61.21	57.38	50.64	48.31
10	47.03	46.98	46.85	47.03	47.10	48.74	50.83	56.48	61.15	57.07	50.47	48.26
11	47.03	46.99	46.88	47.07	47.10	48.70	50.84	56.93	61.10	56.82	50.31	48.23
12	47.02	47.01	46.89	47.12	47.09	48.63	50.88	57.40	61.08	56.51	50.18	48.19
13	47.00	47.06	46.89	47.13	47.09	48.58	51.04	57.90	61.05	56.20	50.05	48.13
14	46.99	47.09	46.89	47.16	47.07	48.54	51.26	58.46	61.04	55.94	49.95	48.12
15	46.96	47.11	46.88	47.16	47.04	48.52	51.54	59.02	61.06	55.65	49.84	48.08
16	46.95	47.11	46.85	47.14	47.01	48.53	51.81	59.56	61.10	55.36	49.77	48.03
17	46.96	47.13	46.86	47.12	46.99	48.53	52.07	60.02	61.12	55.07	49.70	48.01
18	46.95	47.14	46.88	47.14	46.96	48.57	52.34	60.39	61.16	54.84	49.63	48.00
19	46.95	47.15	46.89	47.17	46.94	48.65	52.60	60.67	61.20	54.59	49.56	47.94
20	46.94	47.17	46.90	47.17	46.91	48.78	52.84	60.94	61.20	54.35	49.48	47.91
21	46.94	47.16	46.92	47.17	46.91	48.91	53.02	61.27	61.15	54.12	49.39	47.87
22	46.95	47.12	46.95	47.17	46.90	49.02	53.15	61.70	61.07	53.87	49.32	47.82
23	47.00	47.10	46.96	47.17	46.88	49.13	53.29	62.17	60.97	53.67	49.25	47.81
24	46.99	47.06	46.99	47.14	46.89	49.26	53.40	62.56	60.85	53.46	49.17	47.78
25	46.98	47.02	47.00	47.13	46.91	49.38	53.52	62.77	60.74	53.26	49.11	47.75
26	47.00	46.98	47.00	47.09	47.01	49.46	53.61	62.87	60.62	53.06	49.05	47.74
27	46.98	46.94	47.03	47.08	47.31	49.52	53.70	62.85	60.49	52.83	48.99	47.72
28	46.95	46.91	47.06	47.07	47.69	49.60	53.81	62.73	60.33	52.67	48.95	47.70
29	46.94	46.89	47.08	47.05	48.02	49.71	53.92	62.57	60.12	52.49	48.88	47.69
30	46.93	46.86	47.06	47.02	-----	49.80	54.02	62.38	59.90	52.27	48.80	47.67
31	46.92	-----	47.06	47.04	-----	49.87	-----	62.18	-----	52.09	48.73	-----

## CLARK FORK AT PRIEST RIVER, IDAHO

LOCATION.—Water-stage recorder in lot 4, sec. 26, T. 56 N., R. 5 W., at Priest River.

DRAINAGE AREA.—24,200 square miles.

RECORDS AVAILABLE.—June 1903 to April 1905; October 1921 to September 1932. June 1903 to September 1921 comparable records at Newport, Wash., 6 miles below present site.

EXTREMES.—Maximum discharge during year, 98,000 second-feet May 27 (gage height, 18.77 feet); minimum, 4,000 second-feet Feb. 1-2 (gage height, 3.51 feet).

1903-32: Maximum discharge, 136,000 second-feet June 15, 1913; minimum, 2,200 second-feet Dec. 12, 1919.

Maximum stage known, 38.9 feet June 1894, from high-water marks referred to Newport gage (estimated discharge, 217,000 second-feet).

REMARKS.—Records excellent. Numerous small diversions from upper tributaries for irrigation. Flow subject to natural regulation in several lakes and to slight regulation during log-driving seasons, owing to operations of flash dam on tributary of Priest River.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1	6,290	6,140	5,850	6,780	4,100	11,500	20,000	40,600	90,500	74,000	27,800	12,800
2	6,140	5,990	5,710	6,780	4,100	12,800	20,600	40,600	89,800	71,800	26,900	12,400
3	6,140	6,140	5,710	6,780	4,680	13,300	21,200	41,200	89,800	70,200	26,000	12,400
4	6,290	6,140	5,710	6,610	5,100	13,300	22,400	41,800	88,200	68,800	25,400	12,400
5	6,290	6,140	5,710	6,610	5,330	13,800	23,000	42,500	88,200	66,500	24,200	11,900
6	6,450	5,990	5,710	6,450	5,850	13,800	23,600	44,600	87,500	64,200	23,600	11,900
7	6,450	6,140	5,710	6,610	6,290	14,300	23,600	46,700	86,800	62,800	23,000	11,500
8	6,290	6,450	5,710	6,610	6,450	14,800	24,200	48,800	86,000	60,700	22,400	11,000
9	6,140	6,610	5,710	6,610	6,450	14,300	24,200	50,900	85,200	59,300	21,200	11,300
10	6,290	6,450	5,850	6,610	6,610	13,800	24,200	53,700	84,500	56,500	20,600	11,000
11	6,290	6,290	5,990	6,450	7,130	13,300	24,200	56,500	84,500	55,100	20,000	10,800
12	6,290	6,450	5,990	6,950	6,780	13,300	24,200	59,300	84,500	53,000	19,400	10,800
13	6,140	6,780	6,140	7,310	6,610	12,800	24,800	62,100	84,500	50,900	18,900	10,400
14	6,140	6,780	5,990	6,450	6,450	12,800	25,400	66,500	83,800	49,000	18,900	10,100
15	6,140	6,780	5,990	6,610	6,450	12,800	27,200	70,200	84,500	48,100	18,400	10,100
16	6,140	6,610	5,850	6,780	6,450	12,800	29,000	74,000	84,500	46,000	17,800	10,100
17	6,140	6,780	5,990	6,610	6,290	13,300	30,200	77,000	84,500	43,900	17,200	9,100
18	6,140	6,780	6,290	6,780	6,140	13,300	31,400	80,000	84,500	43,200	16,700	9,300
19	6,140	6,780	6,290	6,950	6,140	13,800	32,600	81,500	85,200	41,200	16,200	9,500
20	5,990	7,130	6,290	6,950	6,140	14,300	33,800	83,800	84,500	39,000	16,200	9,500
21	5,990	6,950	6,450	6,950	6,140	14,800	35,000	86,000	84,500	39,200	15,800	9,300
22	6,140	6,780	6,450	7,130	6,140	15,300	35,000	89,000	83,800	37,400	15,300	9,300
23	6,140	6,610	6,450	6,950	6,140	15,800	36,200	92,000	83,000	36,200	15,300	9,100
24	6,140	6,610	6,610	6,950	6,140	16,200	36,800	94,200	82,200	35,600	15,300	8,890
25	6,290	6,950	6,290	6,780	6,290	16,700	37,400	96,500	81,500	34,400	14,800	8,890
26	6,140	7,130	6,610	6,780	6,780	17,200	38,000	97,200	80,800	33,800	14,300	8,890
27	6,290	6,450	6,780	6,610	7,890	17,800	38,000	97,200	80,000	32,600	14,300	8,690
28	6,290	6,140	6,780	6,610	9,300	18,400	38,000	96,500	78,500	31,400	13,800	8,690
29	6,290	5,990	6,780	6,450	10,400	18,400	38,600	95,000	77,000	30,200	13,300	8,690
30	6,290	5,990	6,780	6,610		18,900	39,200	93,500	75,500	29,600	13,300	8,490
31	6,140		6,950	4,880		19,400		92,000		28,400	12,800	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	6,450	5,990	6,210	0.257	0.30	382,000
November	7,130	5,990	6,500	.269	.30	387,000
December	6,950	5,710	6,170	.255	.29	379,000
January	7,310	4,880	6,680	.276	.32	411,000
February	10,400	4,100	6,370	.263	.28	366,000
March	19,400	11,500	14,700	.607	.70	904,000
April	39,200	20,000	29,400	1.21	1.35	1,750,000
May	97,200	40,600	70,700	2.92	3.37	4,350,000
June	90,500	75,500	84,300	3.48	3.88	5,020,000
July	74,000	28,400	48,200	1.99	2.29	2,960,000
August	27,800	12,800	18,700	.773	.89	1,150,000
September	12,800	8,490	10,200	.421	.47	607,000
The year	97,200	4,100	25,700	1.06	14.44	18,700,000

## CLARK FORK BELOW Z CANYON, NEAR METALINE FALLS, WASH.

(International gaging station)

**LOCATION.**—Water-stage recorder in lot 2, sec. 11, T. 40 N., R. 48 E., three quarters of a mile below Z Canyon and 10 miles below Metaline Falls.

**DRAINAGE AREA.**—25,200 square miles.

**RECORDS AVAILABLE.**—October 1928 to September 1932; November 1908 to September 1910 and October 1912 to September 1928 for station at Metaline Falls.

**EXTREMES.**—Maximum discharge during year, 98,300 second-feet May 28 (gauge height, 40.97 feet); minimum, 4,860 second-feet Dec. 1, 18 (gauge height, 9.7 feet).

1912-32: Maximum discharge, 139,000 second-feet June 16, 1913 (gauge height, 41.2 feet, Metaline Falls gauge); minimum, 2,500 second-feet Dec. 12, 1919 (gauge height, —2.4 feet, Metaline Falls gauge).

**REMARKS.**—Records excellent except those for period Jan. 30 to Feb. 6, which were estimated because of ice. Numerous small diversions from upper tributaries for irrigation. No artificial regulation of any consequence. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	6,220	6,220	5,200	7,090	5,400	12,100	21,500	42,900	94,200	79,100	29,400	13,300
2.....	6,220	6,220	5,370	7,090	5,000	13,000	21,800	43,600	93,400	77,200	28,400	13,000
3.....	6,220	6,050	5,880	7,090	5,000	13,600	23,200	44,200	92,700	75,700	27,400	12,700
4.....	6,220	6,050	5,880	6,910	5,000	14,200	23,500	45,100	92,100	74,100	26,800	12,700
5.....	6,390	6,220	6,050	6,910	5,200	14,200	24,500	46,700	91,100	72,100	25,800	12,400
6.....	6,390	6,220	6,050	6,910	5,500	14,500	24,800	47,000	90,300	70,100	25,100	12,400
7.....	6,390	6,220	5,880	6,730	5,880	14,800	25,100	48,500	89,800	67,700	24,500	12,100
8.....	6,390	6,050	5,880	6,730	6,390	14,800	25,100	50,400	89,300	65,600	23,800	11,800
9.....	6,390	6,390	5,880	6,730	6,730	15,100	25,100	52,200	88,800	63,300	22,800	11,200
10.....	6,390	6,560	5,880	6,730	6,730	15,100	25,500	54,800	88,200	62,000	21,800	11,200
11.....	6,390	6,560	5,880	6,730	6,730	14,800	25,800	57,400	88,000	59,400	21,500	11,200
12.....	6,560	6,560	6,050	6,560	6,730	14,500	26,100	60,400	87,400	57,000	20,800	11,000
13.....	6,390	6,560	5,880	6,730	6,730	14,200	27,100	64,000	87,200	55,100	20,200	10,700
14.....	6,390	6,910	5,710	7,280	6,910	14,200	28,400	66,300	87,200	53,200	19,500	10,700
15.....	6,390	7,090	5,710	7,280	6,910	13,900	28,800	69,700	86,900	51,000	19,100	10,400
16.....	6,220	7,090	5,370	6,730	6,910	13,900	30,100	73,800	86,900	49,800	18,800	10,400
17.....	6,220	6,910	5,200	7,090	6,910	13,900	31,400	77,200	86,600	47,900	18,400	10,200
18.....	6,220	6,910	6,220	6,910	6,730	13,900	32,400	80,000	86,600	46,400	18,100	9,670
19.....	6,050	7,090	7,670	6,560	6,560	14,200	33,700	82,700	86,600	44,800	17,400	9,430
20.....	6,050	6,910	7,470	7,090	6,730	14,800	35,600	85,000	86,900	43,200	17,100	9,430
21.....	6,050	7,090	6,730	7,470	6,560	15,100	36,500	86,900	86,900	42,000	16,700	9,430
22.....	6,220	7,090	6,730	6,730	6,730	15,800	37,400	89,300	86,600	40,600	16,400	9,430
23.....	6,390	7,090	6,560	6,220	6,730	16,400	38,600	91,900	86,600	39,500	16,100	9,430
24.....	6,220	6,730	6,730	6,050	6,730	16,700	39,200	93,400	85,800	38,300	15,800	9,430
25.....	6,220	6,730	6,730	6,220	6,910	17,400	39,800	95,300	85,000	37,100	15,400	9,190
26.....	6,390	6,730	6,730	6,730	7,280	17,800	40,600	96,600	84,500	35,600	15,100	9,190
27.....	6,390	7,090	6,730	7,280	8,080	18,100	41,500	97,400	83,600	34,600	15,100	8,960
28.....	6,220	6,910	6,910	7,090	9,430	18,800	41,500	98,000	82,700	33,700	14,800	8,960
29.....	6,220	6,220	7,090	6,730	11,000	19,500	41,800	97,700	81,800	32,700	14,200	8,960
30.....	6,220	5,540	6,910	6,600	-----	20,200	42,300	96,600	80,400	31,400	13,900	8,960
31.....	6,220	-----	7,090	5,900	-----	20,500	-----	95,600	-----	30,400	13,600	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October.....	6,560	6,050	6,290	0.250	0.28	387,000
November.....	7,090	5,540	6,600	.262	.28	393,000
December.....	7,670	5,200	6,270	.249	.28	388,000
January.....	7,470	5,600	6,790	.269	.37	418,000
February.....	11,000	5,000	6,690	.265	.28	385,000
March.....	20,500	12,100	15,500	.615	.77	953,000
April.....	42,300	21,500	31,300	1.24	1.38	1,860,000
May.....	98,000	42,900	71,900	2.85	3.28	4,420,000
June.....	94,200	80,400	87,500	3.47	3.87	5,210,000
July.....	79,100	30,400	52,000	2.06	2.38	3,200,000
August.....	29,400	13,600	19,800	.786	.97	1,220,000
September.....	13,300	8,960	10,600	.421	.47	631,000
The year.....	98,000	5,000	26,800	1.06	14.48	19,500,000

## FLATHEAD RIVER NEAR TRAIL CREEK, MONT.

(International gaging station)

LOCATION.—Staff gage at highway bridge 500 feet north of international boundary, about 1,000 feet northwest of intersection of international boundary with line between sections 4 and 5, T. 37 N., R. 22 W., and 7 miles northwest of Trail Creek post office.

DRAINAGE AREA.—450 square miles.

RECORDS AVAILABLE.—March 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 8,030 second-feet May 22 (gage height, 6.12 feet); minimum, 138 second-feet Oct. 19–21, 31, Nov. 1, 2 (gage height, 0.97 foot). Lower discharge may have occurred during winter, when gage was not read.

1929–32: Maximum discharge, that of May 22, 1932; minimum recorded, 65 second-feet Apr. 9, 1929 (gage height, 0.76 foot); probably not actual minimum.

REMARKS.—Records good. No records Nov. 22 to Mar. 31. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	157	138	307	964	4,390	1,640	493	340
2	155	138	335	1,090	6,520	1,560	479	352
3	152	140	400	1,380	5,280	1,520	465	340
4	150	147	376	1,780	4,680	1,470	439	329
5	150	152	376	2,140	3,520	1,390	432	323
6	155	157	340	2,840	3,370	1,260	426	307
7	160	162	318	3,500	3,440	1,200	413	296
8	157	188	323	3,920	3,580	1,150	388	296
9	157	204	307	4,610	3,920	1,110	382	285
10	155	220	329	5,320	3,920	1,040	376	281
11	152	232	370	5,780	4,370	946	432	276
12	152	236	456	5,540	4,800	919	479	262
13	150	220	650	6,680	4,840	894	452	255
14	145	216	894	7,200	5,130	846	439	249
15	143	204	1,220	4,990	5,060	793	413	240
16	143	204	1,180	3,580	4,800	770	388	240
17	143	191	1,280	3,560	4,330	740	376	236
18	140	188	1,380	4,050	4,070	733	364	240
19	138	191	1,260	4,920	3,280	703	352	232
20	138	197	1,140	6,420	2,990	680	340	262
21	138	191	1,040	7,430	2,970	665	445	232
22	140	---	919	8,030	2,990	650	426	232
23	140	---	964	6,730	3,040	620	382	232
24	143	---	964	4,110	2,970	605	352	228
25	140	---	964	3,300	2,520	577	340	224
26	143	---	937	2,990	2,270	549	335	224
27	147	---	894	2,410	2,080	535	323	216
28	145	---	894	2,140	1,860	535	313	216
29	143	---	902	2,140	1,790	521	307	212
30	140	---	910	2,770	1,750	514	335	212
31	138	---	---	3,130	---	507	335	---

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	160	138	147	0.33	0.38*	9,040
November 1–21	236	138	186	.41	.32	7,750
April	1,380	307	756	1.68	1.87	45,000
May	8,030	964	4,050	9.00	10.38	249,000
June	6,520	1,750	3,680	8.18	9.13	219,000
July	1,640	507	892	1.98	2.28	54,800
August	452	307	394	.58	1.01	24,200
September	352	212	261	.58	.65	15,500
The period	8,030	138	1,340	2.98	26.02	624,000

## FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 7, T. 31 N., R. 19 W., at Potter's ranch, three quarters of a mile above junction with Middle Fork and 10 miles northeast of Columbia Falls.

DRAINAGE AREA.—1,620 square miles.

RECORDS AVAILABLE.—September 1910 to September 1917; April to August 1929; May 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 21,200 second-feet May 23 (gage height, 10.35 feet); minimum, 377 second-feet Jan. 31 (gage height, 1.47 feet, ice affected).

1910-16, 1929-32: Maximum discharge, 29,500 second-feet June 20, 1916 (gage height, 9.8 feet); minimum, 350 second-feet Nov. 10, 1911, Feb. 5-16, 1914 (gage height, 0.70 foot).

REMARKS.—Records good except those for period of ice effect, Nov. 24 to Feb. 25, which are fair. No records Oct. 1-13, Oct. 24 to Nov. 23, July 10 to Aug. 5.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			501	434	400	3,900	1,540	4,240	11,200	7,300		1,230
2			510	436	415	3,370	1,950	4,240	17,000	6,800		1,230
3			542	434	420	3,980	2,330	4,610	16,600	6,560		1,180
4			596	421	430	2,200	2,460	5,860	15,000	6,560		1,140
5			605	406	475	2,080	2,330	7,300	13,900	6,560		1,100
6			592	403		1,770	2,200	8,400	12,500	5,860	1,600	1,060
7			600	432		1,430	2,140	9,900	11,500	5,320	1,540	1,020
8			592	436	460	1,100	2,200	11,500	11,200	4,800	1,540	982
9			553	426		1,100	2,140	12,800	11,500	4,520	1,480	982
10			553	427		1,140	2,200	14,300	11,800		1,480	945
11			504	464	452	1,140	2,530	15,400	11,800		1,650	910
12			501	472	450	1,180	3,160	15,800	12,500		1,650	910
13			485	408	446	1,280	3,980	17,000	14,300		1,650	875
14	635		475	390	440	1,280	5,000	18,600	15,800		1,540	875
15	625		466	390	450	1,280	5,210	17,400	16,200		1,480	845
16			454	390	458	1,280	5,860	13,900	15,400		1,380	845
17	610		501	420	464	1,180	6,090	12,500	14,700		1,330	815
18	596		592	422	460	1,180	6,320	12,500	13,200		1,330	815
19	596		655	450	470	1,230	6,090	12,500	12,500		1,280	845
20	596		675	442	501	1,230	5,860	13,600	11,500		1,280	845
21	569		630	427	507	1,180	5,320	15,800	10,800		1,540	815
22	596		592	430	546	1,140	5,000	18,400	11,500		1,650	815
23	587		578	415	553	1,100	5,100	18,900	12,500		1,540	788
24		553	539	408	553	1,100	5,100	16,200	12,500		1,480	788
25		556	444	422	640	1,100	5,000	13,200	11,200		1,380	788
26		519	444	408	1,180	1,060	4,700	11,200	10,200		1,330	760
27		492	446	408	1,830	1,020	4,520	9,300	9,300		1,280	760
28		501	440	418	3,230	1,100	4,420	8,110	8,700		1,230	760
29		507	444	408	3,980	1,230	4,330	7,560	8,110		1,180	732
30		501	418	400		1,140	4,160	8,110	7,830		1,180	732
31			422	396		1,230		9,600			1,280	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October 14-23	635	569	602	0.372	0.14	11,900
November 24-30	556	492	518	.320	.08	7,190
December	675	418	527	.325	.37	32,400
January	472	390	421	.260	.30	25,900
February	2,980	400	760	.469	.51	43,700
March	3,980	1,020	1,510	.932	1.07	92,800
April	6,320	1,540	3,970	2.45	2.73	236,000
May	19,900	4,240	12,000	7.41	8.54	738,000
June	17,000	7,830	12,400	7.65	8.54	738,000
July 1-9	7,300	4,520	6,030	3.72	1.38	108,000
August 6-31	1,650	1,180	1,430	.883	.85	73,700
September	1,230	732	906	.559	.62	53,900

## FLATHEAD RIVER AT COLUMBIA FALLS, MONT.

LOCATION.—Water-stage recorder in SW¼ sec. 17, T. 30 N., R. 27 W., about 200 feet below highway bridge on Roosevelt Highway at Columbia Falls.

RECORDS AVAILABLE.—May 1922 to September 1923 (fragmentary); June 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 89,800 second-feet May 22 (gage height, 16.46 feet); minimum, 1,110 second-feet Jan. 25-26, 27-31.

1922-23, 1928-32: Maximum discharge, 102,000 second-feet June 5, 1923 (gage height, 17.3 feet); minimum, 798 second-feet Dec. 8, 1929 (gage height, -0.08 foot).

REMARKS.—Records good except those for period of ice effect, Nov. 23 to Feb. 27, 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.....	2,330	1,720	1,510	1,460	1,150	13,200	5,990	14,700	31,800	21,800	5,520	3,550
2.....	2,260	1,720	1,560	1,460	1,280	11,100	8,070	14,700	49,000	20,900	5,290	3,550
3.....	2,200	1,780	1,720	1,410	1,410	8,930	9,230	15,800	48,200	19,200	4,960	3,460
4.....	2,200	1,830	1,830	1,410	1,460	7,790	9,530	20,000	42,600	20,000	4,860	3,380
5.....	2,200	1,890	1,830	1,460	1,560	7,250	8,930	25,900	39,500	20,900	4,660	3,220
6.....	2,260	1,890	1,830	1,510	1,610	6,230	8,350	31,200	35,900	17,900	4,560	3,060
7.....	2,200	2,010	1,830	1,510	1,560	5,520	8,070	35,900	31,800	15,800	4,460	3,060
8.....	2,140	2,910	1,950	1,600	1,660	4,660	7,790	41,800	31,800	14,700	4,270	2,980
9.....	2,070	3,550	1,950	1,510	1,610	4,560	7,520	46,500	33,800	13,600	4,180	2,910
10.....	2,010	3,550	1,830	1,510	1,560	4,560	7,520	52,400	34,500	12,800	4,180	2,840
11.....	1,950	3,380	1,830	1,510	1,460	4,460	8,070	55,900	35,200	12,100	4,460	2,760
12.....	1,950	3,140	1,720	1,510	1,560	4,270	10,800	56,800	38,800	11,400	4,760	2,680
13.....	1,890	3,060	1,720	1,230	1,510	4,360	15,000	66,000	45,000	10,800	4,560	2,610
14.....	1,890	2,980	1,720	1,230	1,610	4,360	20,900	75,400	49,800	10,500	4,270	2,610
15.....	1,830	2,910	1,610	1,230	1,610	4,270	21,400	64,100	52,400	10,200	4,080	2,540
16.....	1,830	2,760	1,510	1,410	1,780	4,270	21,800	47,300	50,600	9,530	3,990	2,470
17.....	1,780	2,760	1,720	1,410	1,830	4,080	23,300	40,300	46,500	9,230	3,900	2,470
18.....	1,780	2,680	1,830	1,460	1,720	3,990	23,800	41,800	41,800	8,930	3,900	2,400
19.....	1,720	2,610	2,200	1,510	1,890	4,760	22,300	44,200	38,000	8,930	3,810	2,400
20.....	1,720	2,540	2,140	1,410	1,890	5,640	20,900	49,800	33,800	8,350	3,720	2,470
21.....	1,720	2,140	2,200	1,410	1,890	5,400	18,700	63,200	32,500	8,070	3,810	2,470
22.....	1,660	1,660	2,070	1,230	1,890	5,070	17,000	84,100	37,300	7,790	4,080	2,460
23.....	1,720	1,660	2,010	1,190	1,950	4,860	17,000	72,600	39,500	7,250	4,080	2,330
24.....	1,720	1,720	1,950	1,150	2,010	4,760	16,600	52,400	38,800	6,990	3,990	2,330
25.....	1,720	1,780	1,830	1,110	2,140	4,660	16,200	40,300	34,500	6,990	3,900	2,330
26.....	1,830	1,660	1,830	1,110	2,980	4,460	15,800	33,200	31,200	6,730	3,720	2,260
27.....	1,830	1,410	1,720	1,150	9,230	4,270	15,000	27,600	28,200	6,480	3,550	2,260
28.....	1,830	1,460	1,830	1,110	17,000	4,360	15,000	24,300	25,900	6,110	3,460	2,200
29.....	1,830	1,470	1,830	1,110	15,800	4,860	15,000	22,300	24,300	5,990	3,380	2,200
30.....	1,720	1,510	1,610	1,110	-----	4,760	14,700	24,300	23,800	5,990	3,380	2,200
31.....	1,720	-----	1,560	1,110	-----	4,960	-----	28,200	-----	5,750	3,640	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2,330	1,660	1,920	118,000
November.....	3,550	1,410	2,270	135,000
December.....	2,200	1,510	1,820	112,000
January.....	1,600	1,110	1,340	82,400
February.....	17,000	1,150	2,990	172,000
March.....	13,200	3,990	5,510	339,000
April.....	23,800	5,990	14,300	851,000
May.....	84,100	14,700	42,400	2,610,000
June.....	52,400	23,800	37,600	2,240,000
July.....	21,800	5,750	11,300	695,000
August.....	5,520	3,380	4,170	256,000
September.....	3,550	2,200	2,680	159,000
The year.....	84,100	1,110	10,700	7,770,000

## FLATHEAD RIVER NEAR KALISPELL, MONT.

LOCATION.—Chain gage in NE¼ sec. 10, T. 28 N., R. 21 W., at highway bridge 3 miles east of Kalispell. Gage readings adjusted to mean sea level, Somers datum.

RECORDS AVAILABLE.—May 1928 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 2,912.86 feet May 22; minimum, 2,901.74 feet Sept. 30.

1928-32: Maximum water-surface elevation, 2,913.95 feet May 27, 1928; minimum, 2,901.74 feet Sept. 30, 1932.

REMARKS.—Records collected for river-profile study. Records fragmentary but reliable.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.06				2.61	6.62		6.95		8.02	4.15	
2		2.50		2.15	2.58		5.40		10.35		4.02	2.82
3	3.00	2.54	3.30			5.73	5.65	7.12			3.84	2.74
4		2.64		2.50	2.48		5.73	7.94	9.99	7.68		
5	3.01	2.64	3.52	2.60		5.62	6.68	8.40		7.95	3.64	2.65
6		2.68		2.60				8.98		7.52		2.60
7			3.30	2.60		5.45	5.35	9.28	9.15	7.21		2.52
8			3.20		3.00	6.52			9.08		3.44	2.41
9	2.85	3.02		2.62	3.06	7.80	5.25	10.18	9.13	6.91		2.32
10	2.84	3.80	3.10		3.10	8.14			9.21		3.36	2.30
11		3.72	2.95	2.68	3.06	8.65	5.38	10.74		6.42	3.46	
12	2.76	3.61	2.90	3.22			6.65	10.78	9.55	6.38	3.51	2.22
13	2.70	3.52	2.80	3.10	3.01	8.50	7.05	11.15	9.75	6.24	3.57	2.18
14	2.68		2.68			8.95	7.95	12.10	10.08	6.10		2.12
15	2.66	3.44		2.80	2.66	8.52	7.93	11.40	10.32	6.01	3.33	2.08
16			2.50		2.71	7.85	7.92	10.10	10.18		3.22	
17	2.59	3.47	2.46	3.30	2.80	5.60		9.70	10.05		3.16	2.06
18		3.36	3.06	3.28		4.45	8.24	9.78	9.62	5.82	3.12	
19	2.50	3.30		3.30	2.64	4.40	8.10	9.96		5.54		1.98
20	2.49	3.20		3.28	2.70	4.50	8.10		9.18	5.29	3.05	1.98
21	2.48	3.04	3.24	3.08	2.76	4.53	8.02	10.28	9.00	5.19		2.00
22	2.50	3.10	3.28		2.82	4.48	7.82	12.80	9.25	5.02	3.08	1.96
23		3.62	3.22	2.80	2.84	4.45	7.30			4.92	3.27	1.94
24	2.53	3.75					7.28	10.82	9.48		3.23	1.94
25			2.82	2.38	2.95	4.35	7.20	9.94	9.15	4.73	3.10	
26	2.66	4.20	2.68			4.25	7.10			4.64	3.00	1.88
27	2.60			2.42	5.30		6.92	8.84	8.65			1.84
28	2.58	3.70	2.68	2.58	7.35	4.18	6.90	8.62	8.46	4.42		1.78
29	2.54		2.68	2.66	7.15	4.26				4.38	2.78	
30		3.42	2.72			4.32	6.90	8.46	8.26	4.32	2.68	1.74
31	2.51		2.44	2.68		4.36		8.90			2.98	

NOTE.—Add 2,900.00 feet to obtain elevation above mean sea level, Somers datum.



## FLATHEAD RIVER AT DEMERSVILLE, NEAR KALISPELL, MONT.

LOCATION.—Staff gage in NE¼ sec. 28, T. 28 N., R. 21 W., at Demersville, 3 miles south of Kalispell.

RECORDS AVAILABLE.—April 1909 to July 1912; April 1928 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 2,900.60 feet May 15; minimum, 2,882.6 feet Oct. 8 to Dec. 31, 1931.

1909-12, 1928-32: Maximum water-surface elevation, 2,904.4 feet May 27, 1928; minimum, 2,882.6 feet Oct. 1, 1910, during February 1929 and Oct. 8 to Dec. 31, 1931.

REMARKS.—Records for profile study of Flathead River between Kalispell and Flathead Lake. Records good except those for October to December. No records Jan. 1 to Mar. 19. Sandbar below gage affects stages below 2,883.00 feet.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	82.7	82.6	82.6	-----	84.01	88.50	94.30	92.70	85.70	83.71
2.....	82.7	82.6	82.6	-----	84.31	88.50	95.80	92.30	85.60	83.71
3.....	82.7	82.6	82.6	-----	84.71	88.60	97.20	91.90	85.41	83.71
4.....	82.7	82.6	82.6	-----	85.11	89.30	96.40	91.70	85.31	83.61
5.....	82.7	82.6	82.6	-----	85.11	90.40	96.00	92.00	85.21	83.55
6.....	82.7	82.6	82.6	-----	85.11	91.50	95.70	91.40	85.03	83.51
7.....	82.7	82.6	82.6	-----	85.01	92.60	95.10	90.50	84.95	83.51
8.....	82.6	82.6	82.6	-----	85.01	93.60	94.70	90.40	84.89	83.51
9.....	82.6	82.6	82.6	-----	84.91	94.70	94.80	90.00	84.81	83.47
10.....	82.6	82.6	82.6	-----	84.91	95.75	95.00	89.70	84.69	83.39
11.....	82.6	82.6	82.6	-----	85.01	96.70	95.00	89.40	85.01	83.37
12.....	82.6	82.6	82.6	-----	85.40	97.20	95.20	89.20	84.79	83.31
13.....	82.6	82.6	82.6	-----	86.20	97.80	95.90	88.90	84.67	83.31
14.....	82.6	82.6	82.6	-----	87.60	99.70	96.60	88.70	84.59	83.31
15.....	82.6	82.6	82.6	-----	88.90	100.60	97.20	88.70	84.41	83.39
16.....	82.6	82.6	82.6	-----	88.80	97.70	97.40	88.20	85.11	83.39
17.....	82.6	82.6	82.6	-----	89.60	96.00	97.20	88.00	84.51	83.37
18.....	82.6	82.6	82.6	-----	89.90	95.60	96.40	87.80	84.27	83.35
19.....	82.6	82.6	82.6	-----	89.80	96.20	95.70	87.50	84.21	83.33
20.....	82.6	82.6	82.6	83.91	89.40	96.60	95.30	87.40	84.17	83.29
21.....	82.6	82.6	82.6	83.91	89.10	97.80	95.00	87.20	84.11	83.25
22.....	82.6	82.6	82.6	83.81	88.90	100.20	95.00	87.00	84.11	83.21
23.....	82.6	82.6	82.6	83.81	88.80	100.20	95.50	86.90	84.11	83.16
24.....	82.6	82.6	82.6	83.80	88.80	99.80	95.10	86.80	84.07	83.13
25.....	82.6	82.6	82.6	83.71	88.80	97.40	95.20	86.60	84.01	83.07
26.....	82.6	82.6	82.6	83.71	88.70	96.20	94.40	86.40	83.95	83.07
27.....	82.6	82.6	82.6	83.71	88.60	95.20	94.40	86.20	83.91	82.97
28.....	82.6	82.6	82.6	83.71	88.50	94.40	93.70	86.20	83.89	82.90
29.....	82.6	82.6	82.6	83.71	88.60	93.90	93.00	86.10	83.85	83.01
30.....	82.6	82.6	82.6	83.81	88.50	93.70	93.00	85.90	83.81	83.01
31.....	82.6	-----	82.6	83.81	-----	94.00	-----	85.80	83.79	-----

NOTE.—Add 2,800.00 feet to obtain elevation above mean sea level, Somers datum.

## FLATHEAD RIVER AT DAMON RANCH, NEAR KALISPELL, MONT.

**LOCATION.**—Staff gage in NW¼ sec. 32, T. 28 N., R. 20 W., at Damon ranch, 7 miles below Kalispell.

**RECORDS AVAILABLE.**—April 1909 to July 1912; May 1928 to September 1932.

**EXTREMES.**—Maximum water-surface elevation, 2,896.94 feet May 23; minimum, 2,881.84 feet Dec. 16.

1909–12, 1928–32: Maximum water-surface elevation, 2,899.6 feet (determined from flood mark) May 26–27, 1928; minimum, 2,881.50 feet Jan. 20–26, 1930.

**REMARKS.**—Records good. No records Jan. 1 to Feb. 27. Records used for river-profile studies on Flathead River above Flathead Lake.

*Elevation, in feet, 1931–32*

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82.17	81.90	81.98	-----	85.00	83.60	87.01	93.64	91.33	85.61	83.59
2	82.16	81.90	81.93	-----	84.40	83.71	87.06	93.81	91.07	85.44	83.55
3	82.13	81.85	81.92	-----	84.10	83.94	87.13	94.14	91.34	85.17	83.50
4	82.10	81.85	81.94	-----	84.00	84.12	87.48	93.81	90.58	85.12	83.45
5	82.19	81.85	81.92	-----	83.96	84.25	88.26	93.62	90.43	84.97	83.37
6	82.12	81.86	81.94	-----	83.74	84.21	88.95	93.40	90.05	84.78	83.34
7	82.06	81.88	81.96	-----	83.66	84.20	89.44	93.05	89.77	84.65	83.35
8	82.12	81.94	81.98	-----	83.60	84.24	90.37	92.86	89.49	84.58	83.36
9	82.06	82.08	81.96	-----	83.54	84.23	91.13	92.89	89.26	84.57	83.29
10	82.02	82.16	81.94	-----	83.48	84.31	91.77	92.92	89.06	84.48	83.22
11	81.99	82.11	81.94	-----	83.46	84.36	92.46	92.91	88.89	84.54	83.18
12	82.02	82.17	81.92	-----	83.26	84.55	92.83	93.04	88.68	84.55	83.21
13	81.99	82.13	81.92	-----	83.24	85.28	93.61	93.46	88.44	84.38	83.21
14	81.99	82.11	81.88	-----	83.22	86.09	94.85	93.83	88.25	84.33	83.15
15	81.98	82.12	81.86	-----	83.31	86.55	95.06	94.08	88.09	84.23	83.05
16	81.95	82.08	81.84	-----	83.33	86.74	93.83	94.27	87.91	84.17	83.00
17	81.98	82.18	81.86	-----	83.31	87.11	92.91	94.18	87.72	84.13	83.00
18	81.98	82.16	81.88	-----	83.30	87.40	92.90	93.78	87.53	84.10	82.96
19	81.99	82.43	81.90	-----	83.30	87.38	93.22	93.35	87.33	84.03	82.96
20	81.96	82.12	81.94	-----	83.50	87.36	93.50	93.09	87.22	84.00	82.86
21	81.94	82.07	81.96	-----	83.40	87.24	94.33	92.96	87.07	83.97	82.84
22	81.96	82.03	81.94	-----	83.34	87.19	95.07	93.11	86.88	83.93	82.80
23	81.97	82.01	81.92	-----	83.33	87.16	96.88	93.22	86.73	83.90	82.78
24	81.93	82.01	81.90	-----	83.35	87.16	95.79	93.22	86.58	83.89	82.76
25	81.90	82.04	81.86	-----	83.44	87.14	95.05	92.93	86.41	83.83	82.72
26	81.95	82.02	81.84	-----	83.36	87.11	94.02	92.55	86.24	83.79	82.70
27	81.96	82.03	81.86	-----	83.36	87.06	93.45	92.19	86.03	83.75	82.70
28	81.95	82.05	81.88	85.30	85.37	87.07	93.26	91.93	85.92	83.71	82.69
29	81.95	82.03	81.90	85.30	83.38	87.07	93.66	91.71	85.82	83.70	82.66
30	81.91	82.01	81.92	-----	83.42	87.02	93.62	91.51	85.75	83.67	82.65
31	81.90	-----	81.94	-----	83.46	-----	93.63	-----	85.69	83.63	-----

**NOTE.**—Add 2,800 feet to obtain elevation above mean sea level, Somers datum.

## FLATHEAD RIVER NEAR HOLT, MONT.

LOCATION.—Staff gage in NE¼ sec. 22, T. 27 N., R. 20 W., at Keller's ranch, near Holt, Mont.

RECORDS AVAILABLE.—1909-12 and June 1928 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 2,893.40 feet May 23; minimum, 2,881.86 feet Oct. 30 to Nov. 1.

1909-12, 1928-32: Maximum water-surface elevation, 2,887.35 feet May 29-30, 1928 (determined from flood mark); minimum, 2,881.24 feet Jan. 25-28, 1930.

REMARKS.—Records good. No records during January and February. Records used for profile study of river between Kalispell and Flathead Lake.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82.14	81.86	81.92	82.88	83.36	86.58	91.36	91.34	85.26	83.44
2	82.14	81.88	81.92	82.86	83.42	86.56	91.64	91.20	85.16	83.40
3	82.14	81.88	81.92	82.88	83.58	86.74	91.70	91.04	85.04	83.36
4	82.14	81.90	81.94	82.98	83.66	86.78	91.82	91.86	84.92	83.34
5	82.12	81.90	81.94	83.08	83.74	87.04	91.78	89.72	84.80	83.30
6	82.10	81.92	81.96	83.00	83.80	87.42	91.76	89.54	84.72	83.28
7	82.08	81.92	81.96	83.02	83.84	87.78	91.58	89.32	84.60	83.24
8	82.06	81.94	81.96	83.02	83.88	88.24	91.42	89.08	84.54	83.22
9	82.04	81.94	81.94	83.04	83.94	88.68	91.38	88.80	84.48	83.18
10	82.02	81.96	81.94	83.04	83.96	89.14	91.30	88.58	84.40	83.16
11	82.02	81.98	81.94	83.06	84.00	89.60	91.24	88.36	84.36	83.12
12	82.00	82.00	81.92	83.06	84.18	90.00	91.48	88.16	84.30	83.10
13	82.00	82.04	81.92	83.08	84.40	90.50	91.64	87.92	84.26	83.06
14	82.00	82.02	81.92	83.08	84.70	91.26	91.72	87.82	84.20	83.04
15	81.98	82.02	81.92	83.10	85.12	91.78	91.84	87.54	84.16	83.00
16	81.98	82.00	81.94	83.10	85.38	91.58	91.98	87.28	84.10	82.96
17	81.98	82.00	81.94	83.12	85.62	91.50	92.00	87.14	84.06	82.92
18	81.96	82.00	81.94	83.12	85.92	91.46	92.02	87.02	84.00	82.88
19	81.96	82.00	81.92	83.16	86.02	91.64	91.94	86.90	83.96	82.84
20	81.94	81.98	81.92	83.20	86.18	91.76	91.80	86.76	83.90	82.80
21	81.94	81.98	81.92	83.22	86.26	92.08	91.74	86.62	83.86	82.76
22	81.92	81.98	81.92	83.24	86.34	92.80	91.70	86.46	83.80	82.74
23	81.92	81.98	81.92	83.24	86.40	93.40	91.66	86.30	83.76	82.70
24	81.90	81.98	81.92	83.30	86.44	93.28	91.64	86.18	83.72	82.68
25	81.90	81.96	81.92	83.30	86.46	93.08	91.56	86.02	83.68	82.64
26	81.90	81.96	81.92	83.30	86.48	92.80	91.42	85.92	83.66	82.62
27	81.88	81.96	81.94	83.28	86.50	92.48	91.20	85.78	83.62	82.60
28	81.88	81.96	81.94	83.28	86.52	92.14	91.04	85.66	83.60	82.58
29	81.88	81.94	81.96	83.30	86.56	91.88	90.88	85.54	83.58	82.56
30	81.86	81.94	81.96	83.30	86.56	91.62	90.66	85.40	83.52	82.54
31	81.86	-----	81.96	83.32	-----	91.50	-----	85.32	83.48	-----

NOTE.—Add 2,800 feet to obtain elevation above mean sea level, Somers datum.

## FLATHEAD LAKE AT SOMERS, MONT.

LOCATION.—Water-stage recorder in NE¼ sec. 26, T. 27 N., R. 21 W., at steam-boat dock at Somers.

RECORDS AVAILABLE.—April 1922 to September, 1932.

EXTREMES.—Maximum water-surface elevation during year, 2,892.67 feet May 24; minimum, 2,881.53 feet Feb. 22.

1922-32: Maximum water-surface elevation, 2,895.92 feet May 31, 1928; minimum, 2,881.20 feet Dec. 10, 1929.

REMARKS.—Records excellent except those for Oct. 5-18, Aug. 9 to Sept. 12, which are good.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82.13	81.85	81.94	81.94	81.76	82.37	83.33	86.37	91.12	90.31	85.23	83.46
2	82.14	81.85	81.93	81.94	81.76	82.49	83.36	86.38	91.10	90.11	84.14	83.40
3	82.13	81.82	81.92	81.95	81.75	82.66	83.45	86.40	91.23	89.93	85.00	83.36
4	82.12	81.82	81.92	81.95	81.75	82.76	83.53	86.48	91.30	89.75	84.90	83.33
5	82.10	81.82	81.91	81.95	81.75	82.88	83.62	86.58	91.32	89.58	84.75	83.26
6	82.08	81.83	81.90	81.95	81.74	82.96	83.68	86.75	91.32	89.37	84.67	83.24
7	82.05	81.84	81.93	81.94	81.74	82.95	83.73	87.00	91.28	89.17	84.58	83.22
8	82.07	81.88	81.92	81.93	81.74	82.98	83.77	87.28	91.17	88.94	84.50	83.17
9	82.06	81.88	81.92	81.94	81.74	83.00	83.82	87.65	91.08	88.72	84.47	83.13
10	82.04	81.94	81.92	81.95	81.75	83.01	83.86	88.06	91.00	88.50	84.44	83.10
11	82.04	81.96	81.91	81.98	81.72	83.01	83.89	88.48	90.97	88.30	84.41	83.06
12	82.03	81.98	81.92	81.88	81.70	83.02	83.95	88.92	90.93	88.12	84.36	83.07
13	82.03	81.98	81.90	81.88	81.68	83.02	84.03	89.36	90.94	87.90	84.29	83.06
14	82.01	81.99	81.88	81.88	81.68	83.02	84.23	89.87	91.03	87.74	84.16	83.03
15	82.00	82.00	81.87	81.88	81.67	83.05	84.47	90.42	91.17	87.53	84.04	82.96
16	81.98	82.02	81.85	81.87	81.67	83.07	84.72	90.80	91.35	87.34	84.10	82.91
17	81.98	82.03	81.86	81.87	81.68	83.08	84.96	90.95	91.48	87.16	84.04	82.90
18	81.96	82.03	81.88	81.89	81.65	83.09	85.22	91.05	91.54	86.99	84.00	82.88
19	81.95	82.11	81.88	81.90	81.65	83.10	85.45	91.10	91.52	86.85	83.97	82.84
20	81.94	82.02	81.89	81.88	81.67	83.15	85.68	91.20	91.48	86.72	83.94	82.79
21	81.93	82.00	81.92	81.90	81.65	83.16	85.83	91.40	91.37	86.56	83.85	82.74
22	81.94	82.00	81.92	81.92	81.64	83.18	86.06	91.75	91.25	86.40	83.86	82.71
23	81.94	82.00	81.92	81.92	81.64	83.19	86.12	92.18	91.23	86.25	83.79	82.68
24	81.91	81.99	81.92	81.91	81.64	83.23	86.20	92.53	91.21	86.14	83.76	82.66
25	81.88	81.98	81.92	81.89	81.65	83.24	86.23	92.58	91.18	86.00	83.69	82.64
26	81.94	81.97	81.92	81.88	81.69	83.23	86.26	92.50	91.09	85.87	83.67	82.62
27	81.90	81.97	81.92	81.88	81.74	83.24	86.31	92.31	90.98	85.75	83.64	82.60
28	81.88	81.97	81.92	81.86	81.85	83.25	86.32	92.00	90.82	85.64	83.60	83.57
29	81.86	81.96	81.96	81.95	82.15	83.26	86.34	91.73	90.66	85.52	83.58	82.55
30	81.86	81.95	81.93	81.76	-----	83.28	86.36	91.48	90.48	85.40	83.55	82.53
31	81.85	-----	81.94	81.75	-----	83.29	-----	91.26	-----	85.32	83.48	-----

NOTE.—Add 2,800 feet to obtain elevation above mean sea level, Somers datum.

## FLATHEAD LAKE AT POLSON, MONT.

LOCATION.—Water-stage recorder in SW¼ sec. 4, T. 22 N., R. 20 W., at south end of lake at Polson.

RECORDS AVAILABLE.—August 1908 to December 1926; June 1927 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 2,882.71 feet May 24; minimum, 2,881.57 feet Feb. 17.

1908-26, 1928-32: Maximum water-surface elevation, 2,885.85 feet May 29, 1928; minimum, 2,881.5 feet Feb. 16-23, 1913, Nov. 24, 1923.

REMARKS.—Records excellent except those obtained from twice-daily staff-gage readings, Oct. 16 to Nov. 22, Aug. 24 to Sept. 11, which are good.

*Elevation, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	82.11	81.81	81.88	81.92	81.77	82.20	83.21	86.27	90.96	89.15	85.04	83.39
2.....	82.11	81.78	81.86	81.92	81.76	82.45	83.32	86.27	90.94	89.95	84.94	83.33
3.....	82.07	81.80	81.86	81.93	81.75	82.61	83.34	86.27	91.07	89.71	84.90	83.33
4.....	82.06	81.79	81.86	81.93	81.73	82.69	83.45	86.32	91.18	89.50	84.84	83.31
5.....	82.06	81.79	81.86	81.92	81.64	82.78	83.52	86.45	91.24	89.41	84.76	83.31
6.....	82.08	81.77	81.87	81.92	81.65	82.86	83.58	86.63	91.23	89.25	84.70	83.29
7.....	82.10	81.77	81.87	81.91	81.65	82.91	83.64	86.85	91.17	89.06	84.60	83.21
8.....	82.06	81.77	81.87	81.90	81.64	82.94	83.72	87.15	91.08	89.81	84.52	83.08
9.....	82.05	81.78	81.87	81.90	81.64	82.95	83.79	87.48	91.00	89.66	84.40	83.13
10.....	82.05	81.79	81.86	81.89	81.63	82.96	83.83	87.84	90.94	89.42	84.36	83.11
11.....	82.03	81.82	81.87	81.84	81.64	82.97	83.86	88.30	90.86	89.22	84.30	83.07
12.....	82.01	81.83	81.88	81.92	81.64	82.98	83.92	88.75	90.83	89.00	84.23	83.02
13.....	82.00	81.88	81.88	81.96	81.64	83.00	84.01	89.17	90.84	87.82	84.23	82.94
14.....	81.99	81.92	81.88	81.95	81.62	83.01	84.15	89.67	90.94	87.57	84.22	82.92
15.....	81.99	81.96	81.86	81.95	81.62	83.02	84.44	90.27	91.07	87.44	84.15	82.95
16.....	81.96	81.95	81.85	81.94	81.60	83.04	84.68	90.70	91.18	87.28	84.06	82.93
17.....	81.97	81.95	81.84	81.94	81.58	83.05	84.90	90.87	91.34	87.10	84.03	82.82
18.....	81.95	81.94	81.84	81.93	81.58	83.06	85.14	90.93	91.43	86.95	83.98	82.71
19.....	81.94	81.89	81.84	81.92	81.59	83.07	85.40	91.02	91.45	86.78	83.93	82.72
20.....	81.91	81.87	81.85	81.92	81.62	83.08	85.62	91.09	91.37	86.60	83.89	82.72
21.....	81.91	81.93	81.86	81.92	81.64	83.10	85.77	91.25	91.27	86.49	83.88	82.74
22.....	81.89	81.95	81.85	81.92	81.65	83.13	85.88	91.54	91.20	86.36	83.86	82.74
23.....	81.84	81.94	81.86	81.92	81.70	83.15	86.00	91.98	91.13	86.22	83.76	82.71
24.....	81.82	81.95	81.87	81.92	81.71	83.16	86.10	92.40	91.12	86.08	83.76	82.68
25.....	81.84	81.98	81.87	81.91	81.70	83.17	86.18	92.49	91.07	85.94	83.73	82.66
26.....	81.81	81.93	81.88	81.90	81.60	83.17	86.25	92.40	91.02	85.82	83.72	82.65
27.....	81.83	81.91	81.88	81.90	81.62	83.17	86.22	92.25	90.89	85.71	83.68	82.62
28.....	81.80	81.88	81.88	81.88	81.80	83.17	86.24	91.97	90.72	85.58	83.59	82.58
29.....	81.82	81.87	81.88	81.84	82.00	83.23	86.26	91.65	90.52	85.46	83.49	82.56
30.....	81.83	81.87	81.89	81.84	-----	83.23	86.26	91.37	90.35	85.38	83.41	82.53
31.....	81.80	-----	81.91	81.78	-----	83.25	-----	91.15	-----	85.20	83.37	-----

NOTE.—Add 2,800.00 feet to obtain elevation above mean sea level, Somers datum.

## FLATHEAD RIVER NEAR POLSON, MONT.

LOCATION.—Water-stage recorder in sec. 19, T. 22 N., R. 21 W., at highway bridge at Norrisville, 12 miles below Polson.

DRAINAGE AREA.—7,010 square miles.

RECORDS AVAILABLE.—July 1907 to September 1932.

EXTREMES.—Maximum discharge during year, 54,400 second-feet May 24 (gage height, 13.60 feet); minimum, 2,140 second-feet Feb. 2-5, 14-16.

1907-32: Maximum discharge, 82,100 second-feet May 29-30, 1928 (gage height, 17.1 feet); minimum, 1,360 second-feet Dec. 9-14, 1919, Mar. 14, 1920 (gage height, -0.1 foot).

REMARKS.—Records excellent except those for periods of ice effect, Nov. 20 to Feb. 23, Mar. 4-16. Several diversions from tributaries above Flathead Lake. Flow somewhat regulated by natural storage in Flathead Lake.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,890	2,580	2,540	2,580	2,230	2,680	5,450	17,100	43,500	38,800	11,600	5,630
2	2,890	2,440	2,490	2,580	2,140	4,020	5,820	17,100	43,500	37,400	11,200	5,820
3	2,890	2,580	2,490	2,580	2,140	4,160	5,630	17,100	44,200	36,100	10,900	5,630
4	2,890	2,580	2,540	2,580	2,140	4,160	6,200	17,600	44,900	34,800	10,900	5,630
5	2,890	2,540	2,540	2,580	2,140	4,020	6,200	18,100	45,600	34,200	10,500	5,450
6	3,000	2,490	2,540	2,630	2,190	3,880	6,610	19,000	44,900	32,900	10,200	5,450
7	3,000	2,440	2,540	2,680	2,190	3,880	6,820	20,000	44,900	32,900	9,870	5,450
8	2,890	2,490	2,540	2,680	2,230	3,740	7,040	21,600	44,200	31,000	9,560	4,770
9	2,890	2,490	2,540	2,680	2,230	3,610	7,270	23,200	43,500	29,200	8,960	5,100
10	2,890	2,580	2,580	2,580	2,230	3,740	7,500	25,000	43,500	28,000	8,960	5,100
11	3,000	2,680	2,630	2,490	2,230	3,880	7,500	28,000	42,800	26,700	8,710	4,770
12	2,890	2,630	2,580	2,440	2,190	4,020	7,730	30,400	42,800	25,600	8,450	4,770
13	2,780	2,680	2,580	2,400	2,190	4,160	7,960	32,300	42,800	24,400	8,450	4,770
14	2,780	2,680	2,540	2,400	2,140	4,310	8,200	35,500	43,500	23,200	8,450	4,610
15	2,780	2,780	2,490	2,370	2,140	4,610	9,260	39,400	44,200	22,700	8,200	4,610
16	2,780	2,680	2,490	2,400	2,140	4,770	10,200	41,400	44,900	21,600	8,200	4,610
17	2,680	2,780	2,490	2,400	2,190	4,930	10,900	42,800	46,400	21,000	7,960	4,310
18	2,680	2,680	2,490	2,400	2,190	4,930	12,000	43,500	47,100	20,000	7,730	4,020
19	2,680	2,490	2,540	2,400	2,230	5,100	13,200	43,500	47,100	19,000	7,500	4,160
20	2,680	2,400	2,540	2,400	2,230	5,100	14,000	44,900	46,400	18,100	7,500	4,160
21	2,680	2,400	2,540	2,440	2,320	5,100	14,900	45,600	45,600	18,100	7,500	4,160
22	2,630	2,400	2,580	2,440	2,370	5,270	15,300	46,400	44,900	17,600	7,270	4,160
23	2,440	2,370	2,580	2,440	2,320	5,270	15,800	50,700	44,200	16,700	7,040	4,020
24	2,490	2,370	2,580	2,490	2,400	5,270	16,200	52,200	44,200	15,800	7,040	4,020
25	2,630	2,400	2,630	2,440	2,400	5,270	16,700	53,700	44,200	15,300	7,040	4,020
26	2,490	2,440	2,630	2,440	2,440	5,270	17,100	53,000	44,200	14,900	6,820	3,880
27	2,580	2,490	2,630	2,400	2,320	5,270	17,100	51,500	43,500	14,400	6,610	3,880
28	2,540	2,400	2,630	2,400	2,580	5,450	17,100	50,000	42,100	13,600	6,200	3,880
29	2,630	2,400	2,630	2,370	2,580	5,450	17,100	47,800	40,800	13,200	6,010	3,880
30	2,580	2,490	2,630	2,370	-----	5,450	17,100	46,400	40,100	12,800	5,820	3,740
31	2,580	-----	2,630	2,270	-----	5,630	-----	44,900	-----	12,000	5,820	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	3,000	2,440	2,750	0.392	0.45	169,000
November	2,780	2,370	2,530	.361	.40	151,000
December	2,630	2,490	2,560	.365	.42	157,000
January	2,680	2,270	2,480	.354	.41	152,000
February	2,580	2,140	2,260	.322	.35	130,000
March	5,630	2,680	4,590	.655	.76	282,000
April	17,100	5,450	11,000	1.57	1.75	655,000
May	53,700	17,100	36,100	5.15	5.94	2,220,000
June	47,100	40,100	44,200	6.31	7.04	2,630,000
July	38,800	12,000	23,800	3.32	3.83	1,430,000
August	11,600	5,820	8,290	1.18	1.36	510,000
September	5,820	3,740	4,620	.659	.74	275,000
The year	53,700	2,140	12,100	1.73	23.45	8,760,000

## MIDDLE FORK OF FLATHEAD RIVER AT BELTON, MONT.

LOCATION.—Staff gage in NW¼ sec. 36, T. 32 N., R. 19 W., at Belton.

DRAINAGE AREA.—900 square miles.

RECORDS AVAILABLE.—October 1910 to September 1923; February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 25,200 second-feet May 22 (gage height, 12.40 feet); minimum, 238 second-feet Jan. 27 (gage height, 1.92 feet, ice affected).

1910-23, 1929-32: Maximum discharge, 49,000 second-feet June 21, 1916 (gage height, 20.0 feet); minimum, 115 second-feet Mar. 1, 1929 (gage height, 1.50 feet, ice affected).

REMARKS.—Records excellent except those for period of ice effect, Nov. 23 to Feb. 23, which are fair. No diversions or storage.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	547	368	330	312	300	3,730	1,380	3,310	6,600	4,640	1,150	674
2.....	547	368	349	330	368	2,900	2,170	3,310	10,900	4,330	1,080	738
3.....	524	389	330	330	368	2,280	2,280	3,590	9,710	3,880	1,010	701
4.....	500	410	349	312	389	1,950	2,400	4,640	8,890	5,130	1,010	647
5.....	500	410	368	312	410	1,750	2,280	6,800	8,380	4,800	1,010	622
6.....	500	432	410	295	432	1,470	2,060	8,630	7,440	3,730	945	596
7.....	500	622	410	295	464	1,300	1,850	9,710	6,400	3,310	945	596
8.....	477	890	410	290	432	1,150	1,850	11,900	6,800	3,030	880	596
9.....	454	1,080	410	280	410	1,010	1,850	13,300	7,220	2,900	880	572
10.....	454	1,010	389	280	389	1,060	1,860	14,400	8,130	2,770	880	547
11.....	432	945	368	252	368	1,080	1,950	15,200	7,890	2,520	945	547
12.....	432	880	330	252	330	1,080	2,640	14,400	8,630	2,520	1,010	547
13.....	410	818	312	252	295	1,010	4,640	18,000	10,300	2,400	945	500
14.....	410	818	312	252	280	945	5,650	21,000	10,900	2,280	880	477
15.....	410	768	295	265	265	945	6,020	14,000	11,600	2,280	818	454
16.....	389	701	265	280	265	945	5,650	10,000	10,600	2,170	818	454
17.....	389	701	295	312	265	945	6,020	8,380	9,710	2,170	818	454
18.....	368	647	312	330	265	880	5,830	9,430	8,130	2,060	880	432
19.....	368	596	368	330	265	1,010	5,470	10,000	7,440	1,950	880	432
20.....	368	572	389	330	280	1,300	4,960	12,200	6,400	1,750	818	454
21.....	368	500	368	330	295	1,220	4,480	16,000	6,400	1,650	818	454
22.....	368	432	389	312	295	1,150	3,880	25,200	8,130	1,650	880	432
23.....	368	368	384	312	295	1,150	3,730	16,000	8,130	1,560	818	410
24.....	368	368	349	280	312	1,080	3,730	10,300	8,130	1,560	818	410
25.....	368	389	349	265	410	1,060	3,590	7,440	6,800	1,470	758	410
26.....	368	389	349	265	818	1,010	3,590	6,020	6,020	1,470	701	389
27.....	368	368	330	238	3,590	945	3,310	5,300	5,470	1,470	701	389
28.....	368	368	330	238	7,010	945	3,450	4,640	5,300	1,380	674	368
29.....	368	368	330	250	5,130	1,010	3,450	4,180	4,960	1,380	674	368
30.....	368	349	330	250	1,010	1,010	3,310	5,130	5,130	1,380	647	368
31.....	368	-----	330	-----	-----	1,060	-----	6,020	-----	1,300	647	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	547	368	420	0.467	0.54	25,890
November.....	1,080	349	577	.641	.72	34,300
December.....	410	295	351	.390	.45	21,600
January.....	330	238	287	.319	.37	17,600
February.....	7,010	265	862	.958	1.03	49,600
March.....	3,730	880	1,300	1.44	1.66	79,900
April.....	6,020	1,380	3,510	3.90	4.35	209,000
May.....	25,200	3,310	10,300	11.40	13.14	633,000
June.....	11,600	4,960	7,880	8.76	9.77	469,000
July.....	5,130	1,300	2,480	2.76	3.18	152,000
August.....	1,150	647	863	.958	1.10	53,100
September.....	758	368	502	.558	.62	29,900
The year.....	25,200	238	2,440	2.71	36.93	1,770,000

## SOUTH FORK OF FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.

LOCATION.—Water-stage recorder in NE¼ sec. 17, T. 30 N., R. 19 W., 2 miles above mouth and 9 miles east of Columbia Falls.

DRAINAGE AREA.—1,640 square miles.

RECORDS AVAILABLE.—September 1910 to September 1916; April 1923 to September 1932.

EXTREMES.—Maximum discharge during year, 30,300 second-feet May 22 (gage height, 16.57 feet); minimum, 326 second-feet Jan. 31 (gage height, 2.52 feet, ice affected).

1910-16, 1923-32: Maximum discharge, about 46,200 second-feet June 19, 1916 (gage height, 16.6 feet); minimum, 243 second-feet Mar. 11, 1930 (ice on control).

REMARKS.—Records excellent except those for period of ice effect, Nov. 21 to Feb. 26, and those estimated Mar. 6-19, which are fair. No diversions above station. No storage.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	766	559	531	617	379	4,120	2,480	5,560	10,900	6,900	1,520	999
2	740	576	634	677	520	3,480	3,120	5,720	15,800	6,560	1,480	999
3	721	605	727	617	905	2,600	3,730	6,220	14,200	6,220	1,390	963
4	665	634	799	599	634	1,860	3,730	7,500	12,400	6,560	1,310	893
5	740	640	879	576	769	1,800	3,480	9,740	12,000	6,390	1,270	859
6	766	640	928	634	879		3,120	11,600	11,200	5,400	1,230	832
7	740	825	963	652	1,040		2,940	13,100	10,100	4,800	1,190	805
8	695	1,150	1,040	683	1,040	1,800	2,880	14,600	10,300	4,390	1,190	779
9	671	1,270	1,110	677	928		2,760	16,500	10,700	4,120	1,150	766
10	658	1,230	1,150	689	893		2,760	17,900	10,700	3,860	1,150	753
11	634	1,190	1,040	759	845		3,120	19,000	11,400	3,730	1,310	727
12	611	1,110	839	708	779		4,390	19,500	13,300	3,600	1,310	714
13	605	1,070	812	482	740		6,390	23,300	15,100	3,480	1,270	695
14	582	1,040	695	389	634		8,750	25,800	16,700	3,360	1,230	683
15	570	963	634	445	622	2,200	8,560	20,500	17,200	3,360	1,150	658
16	554	963	576	466	652		8,560	15,500	17,000	3,060	1,070	646
17	542	963	576	477	721		9,340	13,700	15,500	2,880	1,040	640
18	531	963	677	520	893		9,340	14,200	13,700	2,710	1,040	628
19	520	928	928	588	1,070		8,360	15,100	12,600	2,650	999	640
20	515	893	968	576	1,150	2,380	7,800	17,400	11,400	2,540	963	695
21	509	818	999	576	1,270	2,270	6,900	23,300	11,400	2,480	999	695
22	515	695	825	560	1,270	2,110	6,220	29,100	12,600	2,270	1,070	658
23	531	640	785	544	1,310	2,000	6,220	21,600	13,300	2,110	1,110	640
24	548	759	759	528	1,570	1,900	6,060	16,000	12,800	2,060	1,070	628
25	559	658	664	512	1,800	1,860	5,890	12,400	11,600	1,960	1,040	622
26	622	617	646	497	3,240	1,760	5,560	10,300	10,100	1,900	963	611
27	605	599	708	482	4,650	1,660	5,400	8,940	9,340	1,800	928	599
28	588	634	727	424	6,060	1,710	5,720	8,180	8,750	1,760	928	588
29	599	520	708	389	4,940	1,960	5,560	7,440	7,980	1,660	893	576
30	576	450	601	389		1,860	5,400	8,360	7,620	1,620	963	570
31	565		498	374		2,050		9,740		1,570	1,070	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	766	508	615	0.375	0.43	37,800
November	1,270	450	820	.500	.56	48,800
December	1,150	498	788	.480	.55	48,500
January	759	374	662	.337	.39	33,900
February	6,060	379	1,440	.878	.95	82,800
March	4,120	1,660	2,130	1.30	1.50	131,000
April	9,340	2,480	5,480	3.34	3.73	326,000
May	29,100	5,560	14,500	8.84	10.19	892,000
June	17,200	7,620	12,300	7.50	8.37	732,000
July	6,900	1,570	3,480	2.12	2.44	214,000
August	1,520	893	1,140	.695	.80	70,100
September	999	570	719	.438	.49	42,800
The year	29,100	374	3,660	2.23	30.40	2,660,000



## STILLWATER RIVER NEAR WHITEFISH, MONT.

LOCATION.—Water-stage recorder in SW¼ sec. 34, T. 30 N., R. 22 W., 600 feet below highway bridge and 7 miles southwest of Whitefish.

RECORDS AVAILABLE.—November 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 1,910 second-feet May 17 (gage height, 11.54 feet); minimum, 60 second-feet Dec. 16.

1930-32: Maximum discharge, that of May 17, 1932; minimum, 58 second-feet Sept. 6, 1931 (gage height, 0.82 foot).

REMARKS.—Records good except those for period of ice effect, Nov. 20 to Mar. 27, which are fair. Some water stored and released for logging operations during summer. No diversions. Discharge not comparable with that at old station near Kalispell because a large spring enters between the stations.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	66	68	79	72	116	253	1,120	1,280	785	238	162
2	66	66	66	78	70	123	225	1,120	1,300	747	232	162
3	66	65	66	79	67	126	225	1,120	1,380	709	225	162
4	65	65	68	78	66	115	258	1,120	1,550	691	218	156
5	65	64	68	77	63	114	292	1,160	1,700	673	212	156
6	66	64	70	72	65	107	321	1,260	1,760	655	206	156
7	66	64	73	83	66	104	344	1,360	1,760	619	206	151
8	65	66	74	87	70	102	366	1,490	1,680	583	199	151
9	64	72	78	89	73	90	382	1,600	1,640	583	192	140
10	64	76	76	94	76	87	398	1,720	1,570	549	192	137
11	64	79	74	102	77	88	430	1,830	1,510	532	199	134
12	63	81	72	100	74	89	481	1,890	1,450	498	206	131
13	62	81	66	94	69	93	566	1,890	1,410	464	206	127
14	62	79	66	77	64	99	673	1,850	1,340	447	206	125
15	62	79	61	79	65	104	805	1,870	1,320	430	206	122
16	63	78	60	82	68	110	905	1,910	1,300	414	192	118
17	62	77	63	87	68	111	985	1,910	1,300	398	192	116
18	62	76	64	94	67	117	925	1,870	1,280	382	186	114
19	62	77	70	96	66	140	905	1,800	1,260	366	180	114
20	62	71	76	100	66	148	945	1,740	1,220	358	174	113
21	62	69	75	101	67	156	985	1,700	1,180	344	174	111
22	62	67	76	96	70	156	1,000	1,720	1,140	328	186	107
23	62	64	77	94	72	174	1,020	1,740	1,060	321	186	107
24	63	62	80	94	75	174	1,060	1,780	1,000	306	192	106
25	64	64	82	92	79	186	1,140	1,780	965	299	192	104
26	64	68	76	93	90	206	1,160	1,780	945	285	186	103
27	65	70	82	92	106	199	1,160	1,740	905	278	180	102
28	66	62	87	89	111	225	1,140	1,660	885	271	174	103
29	66	68	87	84	118	232	1,140	1,550	845	264	168	101
30	66	68	84	79	-----	244	1,120	1,470	805	258	126	100
31	66	-----	82	76	-----	244	-----	1,300	-----	251	162	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	66	62	64.0	3,940
November	81	62	70.2	4,180
December	87	60	73.1	4,490
January	102	72	87.6	5,390
February	118	63	74.5	4,290
March	244	87	141	8,670
April	1,160	225	720	42,800
May	1,910	1,120	1,610	99,000
June	1,760	805	1,290	76,800
July	785	251	454	27,900
August	238	162	194	11,900
September	162	100	126	7,500
The year	1,910	60	409	297,000

## UPPER COLUMBIA RIVER BASIN

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## LOGAN CREEK AT TALLY LAKE, NEAR WHITEFISH, MONT.

LOCATION.—Water-stage recorder in SE¼ sec. 30, T. 31 N., R. 23 W., at Tally Lake, about 10 miles west of Whitefish.

RECORDS AVAILABLE.—August 1931 to September 1932.

EXTREMES.—Maximum stage during year, 6.90 feet May 11 (discharge not computed); minimum discharge, 5.1 second-feet Oct. 4 (gauge height, 1.17 feet). 1931-32: Maximum stage, that of May 11, 1932; minimum discharge, 0.8 second-foot Sept. 6, 1931.

REMARKS.—Records fair. Discharge not computed Dec. 21 to Mar. 15, Apr. 17 to July 6. Natural storage in Tally Lake. Station 5 miles below maintained April to September 1931; records not comparable.

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

Day	Aug.	Sept.	Oct.	Nov.	Dec.	Mar.	Apr.	July	Aug.	Sept.
1		2.1	6.2	10.8	10.8		30		23.8	19.0
2		2.0	6.2	10.8	10.3		32		23.0	19.0
3		2.0	5.8	10.3	10.3		35		23.0	18.3
4		1.8	5.4	10.3	10.3		40		22.2	18.3
5		1.8	5.4	10.3	10.3		46		21.4	18.3
6		1.5	6.2	10.3	10.3		50		20.6	17.6
7		1.2	6.2	12.0	10.8		52	156	19.8	17.6
8		1.2	6.2	15.5	11.4		57	135	18.3	16.9
9		1.8	6.2	16.9	11.4		59	117	16.2	16.2
10		2.0	6.2	20.6	12.0		63	104	16.9	15.5
11		2.1	6.8	22.2	13.4		69	90	19.0	14.8
12		2.4	6.8	22.2	13.4		80	81	19.8	14.1
13		2.4	6.2	21.4	13.4		97	74	19.8	13.4
14		2.8	6.2	21.4	12.7		127	67	20.6	12.7
15		3.5	6.2	20.6	12.7		162	64	19.8	12.7
16		3.9	7.4	19.8	12.7	19.0	203	59	19.0	11.4
17		4.3	7.9	19.0	13.4	19.0		56	19.0	10.8
18		4.7	8.5	19.0	14.1	19.0		52	18.3	10.3
19		5.4	8.5	18.3	14.8	23.0		50	17.6	10.3
20	3.5	5.8	8.5	18.3	14.8	23.8		46	16.9	11.4
21	3.5	6.2	8.5	17.6		23.8		44	16.9	12.0
22	3.5	6.2	9.1	15.5		23.8		42	20.6	12.0
23	3.5	6.8	9.1	14.8		23.8		40	22.2	12.7
24	3.5	6.8	9.1	14.5		25.0		38	23.4	13.4
25	3.2	6.8	9.7	14.1		25.0		36	25.4	13.4
26	2.8	6.8	10.3	13.7		25.0		34	24.6	14.1
27	2.4	7.4	10.3	13.4		25.0		33	24.6	14.1
28	2.4	6.8	10.8	12.0		25.0		32	23.0	14.1
29	2.4	6.8	10.3	11.4		29.0		31	21.4	14.1
30	2.2	6.2	10.8	10.8		29.0		29	19.0	14.1
31	2.2		10.8			29.0		27	19.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931				
August 20-31	3.5	2.2	2.92	69
September	7.4	1.2	4.05	241
1931-32				
October	10.8	5.4	7.80	480
November	22.2	10.3	15.6	928
December 1-20	14.8	10.3	12.2	484
March 16-31	29	19.0	24.2	768
April 1-16	203	30	75.1	2,380
July 7-31	156	27	61.5	3,050
August	25.4	16.2	20.5	1,260
September	19.0	10.3	14.4	857

## WHITEFISH CREEK NEAR KALISPELL, MONT.

LOCATION.—Water-stage recorder in SW¼ sec. 34, T. 30 N., R. 21 W., about 8 miles north of Kalispell. Staff gage at same site used prior to Oct. 16, 1930.

RECORDS AVAILABLE.—November to December 1906; July 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 1,260 second-feet June 3 (gage height, 4.26 feet); minimum, 26 second-feet Oct. 6 (gage height, 1.05 feet).

1906, 1928-32: Maximum discharge, that of June 3, 1932; minimum, 7.2 second-feet Oct. 22, 1929, Oct. 16, 1930 (gage height, 0.94 foot, present gage).

REMARKS.—Records good except those for ice periods, Nov. 30 to Mar. 23, which are fair. Some regulation at Whitefish Lake. No diversion.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	35	101	65	60	60	85	96	428	806	533	137	106
2.....	33	96					120	420	960	512	134	131
3.....	33	94					149	428	1,230	512	134	143
4.....	31	91					158	476	1,230	500	134	134
5.....	27	89					152	637	1,230	476	128	128
6.....	82	89	60	60	65	65	143	658	1,180	456	123	125
7.....	43	89					134	658	1,140	436	120	120
8.....	46	89					131	700	1,090	420	117	120
9.....	51	89					128	700	1,050	440	112	114
10.....	49	53					128	742	1,030	382	96	100
11.....	49	73	50	85	60	91	137	785	982	366	91	104
12.....	49	89					149	872	960	347	128	104
13.....	109	87					177	894	938	340	128	101
14.....	73	87					217	872	938	321	123	99
15.....	35	87					264	894	938	309	114	96
16.....	35	84	55	70	70	101	321	894	938	302	114	96
17.....	106	73					328	872	916	287	112	96
18.....	86	73					336	850	916	283	112	94
19.....	31	75					90	840	850	894	271	109
20.....	29	62					355	850	850	264	109	94
21.....	27	59	55	70	70	77	362	894	828	246	117	91
22.....	89	62					87	362	960	806	242	128
23.....	123	64					84	416	1,030	785	238	125
24.....	120	66					84	472	1,070	764	231	120
25.....	117	69					77	468	1,050	742	221	117
26.....	117	66	55	70	70	77	452	1,000	764	190	114	87
27.....	114	79					444	960	679	155	106	87
28.....	112	75					444	894	658	152	104	84
29.....	109	66					82	440	828	616	149	104
30.....	106	66					84	428	806	574	146	106
31.....	101	-----					84	-----	806	-----	143	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	123	27	68.6	4,220
November.....	101	59	78.1	4,650
December.....	-----	-----	56.6	3,480
January.....	-----	-----	71.6	4,400
February.....	-----	-----	64.8	3,730
March.....	117	-----	78.1	4,800
April.....	472	96	275	16,400
May.....	1,070	420	799	49,100
June.....	1,230	574	914	54,400
July.....	533	143	318	19,600
August.....	137	91	117	7,190
September.....	143	79	102	6,070
The year.....	1,230	27	245	178,000

## ASHLEY CREEK NEAR KALISPELL, MONT.

LOCATION.—Staff gage in SE¼ sec. 16, T. 28 N., R. 22 W., 7 miles west of Kalispell.  
RECORDS AVAILABLE.—April 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 124 second-feet May 14–15 (gage height, 8.20 feet); no flow prior to Mar. 21.

1931–32: Maximum discharge, that of May 14–15, 1932; no flow Aug. 17, 1931, to Mar. 21, 1932.

REMARKS.—Records good except those estimated, Mar. 21–31, which are fair.  
Some diversions and natural storage in Smith Lake.

*Discharge, in second-feet, 1931–32*

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0	43	76	68	14	12	5.2
2.....	0	21	72	68	13	7.3	5.4
3.....	0	35	72	62	15	6.4	4.8
4.....	0	29	76	65	18	5.2	6.0
5.....	0	37	79	65	13	3.6	3.4
6.....	0	30	83	68	13	2.5	3.8
7.....	0	43	94	65	13	2.2	3.4
8.....	0	30	102	65	14	1.1	6.1
9.....	0	19	109	62	6.4	1.2	3.3
10.....	0	20	116	58	8.3	1.2	1.6
11.....	0	22	116	58	11	4.8	2.3
12.....	0	21	124	52	9.7	5.8	2.4
13.....	0	34	116	49	10	6.0	2.5
14.....	0	43	124	46	13	3.3	3.3
15.....	0	37	124	43	12	2.7	1.8
16.....	0	46	124	43	8.3	3.4	1.6
17.....	0	58	116	37	12	4.5	1.8
18.....	0	65	116	33	12	4.5	2.0
19.....	0	62	109	26	15	4.6	2.6
20.....	0	62	102	26	13	4.9	1.7
21.....	20	65	102	20	12	3.3	1.5
22.....		68	109	15	13	4.6	2.0
23.....		79	102	17	13	5.2	1.7
24.....		76	102	12	13	5.4	1.5
25.....		76	94	15	12	4.3	2.0
26.....		72	86	12	6.6	4.2	1.7
27.....		86	76	13	9.5	4.1	1.1
28.....		83	76	13	11	4.1	1.5
29.....		79	72	18	12	6.4	1.6
30.....		79	72	12	12	5.0	1.4
31.....			68		12	5.5	
Month	Maximum	Minimum	Mean	Run-off in acre-feet			
March.....		0	7.1	437			
April.....	86	19	50.7	3,020			
May.....	124	68	97.1	5,970			
June.....	68	12	40.2	2,390			
July.....	18	6.4	11.9	732			
August.....	12	1.1	4.49	276			
September.....	6.1	1.1	2.70	161			
The year.....				13,000			

NOTE.—No flow during months omitted.

## SWAN RIVER NEAR BIG FORK, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 14, T. 26 N., R. 19 W., at outlet of Swan Lake, 7 miles southeast of Big Fork.

DRAINAGE AREA.—647 square miles.

RECORDS AVAILABLE.—April 1922 to September 1932.

EXTREMES.—Maximum discharge during year, 5,710 second-feet May 24 (gage height, 5.92 feet); minimum, 279 second-feet Feb. 20 (gage height, 2.02 feet).

1922-32: Maximum discharge, 7,820 second-feet May 28, 1928 (gage height, 5.90 feet); minimum, 85 second-feet Jan. 24-29, 1931 (gage height, 0.04 foot).

REMARKS.—Records good. No diversions above station. Natural storage in Swan Lake.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	480	382	350	355	302	580	855	1,780	2,540	3,310	922	601
2-----	480	376	345	360	297	630	950	1,720	2,880	3,060	902	601
3-----	456	365	335	360	292	630	1,100	1,690	3,400	2,970	874	594
4-----	438	370	345	360	288	630	1,260	1,750	3,660	2,880	838	580
5-----	450	365	350	360	292	630	1,440	1,870	3,570	2,880	804	580
6-----	456	365	360	355	297	615	1,490	2,060	3,480	2,800	796	566
7-----	444	387	355	355	302	594	1,470	2,380	3,220	2,630	770	559
8-----	456	420	355	350	315	587	1,440	2,880	3,140	2,630	754	538
9-----	426	444	355	350	320	587	1,380	2,970	2,970	2,220	706	532
10-----	426	456	355	350	330	545	1,310	3,220	2,970	2,060	675	526
11-----	426	468	355	350	325	493	1,360	3,570	2,970	1,930	738	532
12-----	409	480	355	365	320	486	1,470	3,750	3,060	1,840	746	519
13-----	398	480	355	365	315	474	1,660	4,020	3,220	1,690	738	506
14-----	398	480	345	330	306	456	2,060	4,480	3,480	1,630	730	500
15-----	382	456	325	315	297	438	2,540	4,950	3,840	1,610	714	493
16-----	360	468	315	315	292	444	2,720	4,760	4,200	1,580	690	493
17-----	355	456	325	325	292	496	2,800	4,380	4,480	1,550	675	493
18-----	360	444	350	345	292	512	2,880	3,930	4,570	1,470	668	474
19-----	365	456	376	365	284	519	2,880	3,750	4,380	1,470	645	480
20-----	360	456	376	365	279	552	2,880	3,750	4,290	1,410	630	480
21-----	360	444	382	360	284	573	2,720	4,020	3,840	1,330	615	500
22-----	360	387	387	365	292	587	2,540	4,760	3,930	1,310	601	493
23-----	360	387	387	365	297	601	2,380	5,520	4,200	1,220	630	486
24-----	360	387	387	350	302	622	2,380	5,520	4,380	1,160	622	486
25-----	365	420	376	330	310	638	2,300	4,950	4,290	1,130	622	480
26-----	376	387	376	330	340	645	2,140	4,290	4,290	1,080	608	480
27-----	382	370	376	335	370	645	2,060	3,660	4,020	1,060	601	486
28-----	382	355	376	345	404	675	1,930	3,140	3,840	1,020	587	480
29-----	382	355	376	345	486	730	1,960	2,720	3,660	970	573	480
30-----	382	360	382	345	-----	787	1,880	2,540	3,480	950	601	474
31-----	382	-----	355	325	-----	804	-----	2,460	-----	940	608	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October-----	480	355	401	0.620	0.71	24,700
November-----	480	355	414	.640	.71	24,600
December-----	387	315	350	.555	.64	22,100
January-----	365	315	348	.538	.62	21,400
February-----	486	279	315	.487	.53	18,100
March-----	804	438	587	.907	1.05	36,100
April-----	2,880	855	1,940	3.00	3.35	115,000
May-----	5,520	1,690	3,460	5.35	6.17	213,000
June-----	4,570	2,540	3,680	5.69	6.35	219,000
July-----	3,310	940	1,800	2.78	3.20	111,000
August-----	922	573	699	1.08	1.24	43,000
September-----	601	474	516	.798	.89	30,700
The year-----	5,520	279	1,210	1.87	25.46	879,000

## BIG CREEK NEAR POLSON, MONT.

LOCATION.—Water-stage recorder in NW¼ sec. 4, T. 22 N., R. 19 W., just below Mission Range Power Co.'s power house, three quarters of a mile above mouth, and 7 miles east of Polson.

RECORDS AVAILABLE.—June 1917 to September 1932.

EXTREMES.—Maximum discharge during year, 9.0 second-feet Mar. 19; minimum, 1.7 second-feet May 28.

1917-32: Maximum discharge, 104 second-feet June 9, 1917; no flow at short intervals during November and December 1922, when power plant was shut down.

REMARKS.—Records fair. Flow regulated by operation of power plant. Discharge determined from kilowatt output of power plant.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	6.6	6.2	7.1	5.4	2.4	6.3	6.6	5.7	4.5	7.3	7.7	7.8
2.....	6.6	8.5	7.1	5.8	2.8	6.2	6.7	6.3	6.6	3.0	7.5	7.8
3.....	6.7	8.6	6.4	5.1	2.9	4.3	6.3	6.1	6.6	3.0	7.8	7.9
4.....	5.7	8.6	6.2	5.7	2.8	3.2	6.5	6.1	6.9	7.3	7.8	6.7
5.....	6.6	8.0	6.0	6.0	2.9	5.8	6.8	6.5	4.6	7.7	7.7	7.4
6.....	6.9	8.2	4.7	6.1	3.0	5.3	7.0	6.2	6.8	7.5	7.8	7.7
7.....	6.8	7.4	6.0	5.9	3.0	6.0	6.8	5.3	7.0	7.6	4.5	7.8
8.....	6.7	4.0	6.1	5.8	6.1	4.4	6.7	5.4	7.1	7.7	7.8	7.7
9.....	6.5	5.2	6.1	6.1	5.8	2.7	6.7	6.2	7.0	7.5	7.6	7.7
10.....	6.7	5.7	6.1	5.3	6.1	3.1	6.0	6.2	6.0	6.8	7.7	7.7
11.....	5.3	5.7	6.0	5.5	5.8	3.0	6.6	5.5	6.5	8.0	7.7	6.7
12.....	6.7	7.4	6.1	5.8	5.8	4.3	6.7	5.7	5.3	4.5	7.7	7.7
13.....	6.6	6.2	5.5	5.8	4.7	5.0	6.7	6.2	7.1	7.9	7.9	7.7
14.....	6.3	6.8	6.0	5.9	1.9	5.9	7.1	6.5	7.5	7.9	6.6	7.8
15.....	6.6	3.4	6.2	5.9	2.8	5.9	7.0	5.3	7.4	7.8	7.7	7.6
16.....	6.7	5.3	6.2	5.8	2.8	5.6	7.2	6.3	7.2	8.0	7.8	7.7
17.....	6.8	5.5	7.0	3.3	4.1	5.3	6.5	6.2	7.8	6.7	7.5	7.9
18.....	4.9	5.4	6.2	3.6	5.6	6.2	6.2	5.5	7.8	8.0	7.7	6.8
19.....	6.7	5.5	6.0	6.3	6.1	9.0	6.2	6.6	5.5	7.7	7.7	7.6
20.....	6.7	7.6	5.2	6.0	6.3	5.3	6.5	6.5	7.7	7.8	7.7	7.5
21.....	6.6	6.6	6.6	6.2	5.4	6.0	6.2	6.1	7.4	7.7	6.7	7.7
22.....	6.6	4.8	5.5	6.2	6.4	5.9	5.7	5.9	7.8	7.6	7.8	7.3
23.....	6.7	6.1	5.8	6.2	6.3	6.1	6.2	7.5	7.6	7.7	7.3	7.7
24.....	7.2	6.7	6.2	5.2	5.7	5.8	4.6	8.0	7.6	6.7	7.7	7.8
25.....	5.5	7.0	5.2	6.2	6.0	6.2	5.8	7.3	7.8	7.7	7.7	6.7
26.....	7.5	4.9	6.1	5.6	5.6	6.0	6.4	7.4	6.6	7.8	7.7	7.7
27.....	7.6	6.4	4.8	5.8	6.1	5.4	6.1	7.2	7.8	7.8	7.8	7.6
28.....	7.4	6.9	5.9	6.1	5.3	6.0	6.3	5.3	7.5	7.6	6.7	7.6
29.....	8.0	4.8	6.3	5.6	6.0	6.1	6.3	1.7	7.8	7.8	7.8	7.7
30.....	8.0	6.8	6.1	6.0	-----	6.0	6.3	4.1	6.8	7.7	7.8	7.7
31.....	8.3	-----	5.9	3.6	-----	6.2	-----	5.9	-----	6.7	7.8	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	8.3	4.9	6.73	414
November.....	8.6	3.4	6.34	377
December.....	7.1	4.7	6.02	370
January.....	6.3	3.3	5.61	345
February.....	6.4	1.9	4.71	271
March.....	9.0	2.7	5.44	334
April.....	7.2	4.6	6.42	382
May.....	8.0	1.7	6.02	370
June.....	7.8	4.5	6.92	412
July.....	8.0	3.0	7.18	441
August.....	7.9	4.5	7.51	462
September.....	7.9	6.7	7.56	450
The year.....	9.0	1.7	6.37	4,630

## PRIEST LAKE AT OUTLET, NEAR COOLIN, IDAHO

LOCATION.—Staff gage in W½ sec. 5, T. 59 N., R. 4 W., 400 feet north of lake outlet and 2 miles northwest of Coolin. Zero of gage is 2,435.06 feet above mean sea level, United States Coast and Geodetic Survey datum, or 2,437.99 feet, United States Geological Survey datum (Bulletin 567).

DRAINAGE AREA.—572 square miles.

RECORDS AVAILABLE.—April 1928 to September 1932. Fragmentary gage-height records at Coolin from June 1911 to September 1913 are published in connection with station on Priest River at outlet of Priest Lake, at Coolin.

EXTREMES.—Maximum gage height during year, 5.94 feet May 23; minimum, 0.06 foot Oct. 20, 21.

1928-32: Maximum gage height, that of May 23, 1932; minimum, that of Oct. 20, 21, 1931.

REMARKS.—Records good.

*Gage height, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0.13	0.23	0.42	0.64	0.60	1.02	1.68	4.24	4.80	3.32	1.40	0.68
2.....	.10	.22	.42	.64	.60	1.16	1.76	4.24	4.89	3.20	1.35	.67
3.....	.10	.22	.43	.64	.62	1.26	1.90	4.30	4.94	3.15	1.30	.66
4.....	.12	.22	.42	.62	.60	1.32	2.02	4.34	4.88	3.08	1.26	.64
5.....	.14	.23	.44	.66	.60	1.36	2.10	4.44	4.88	3.00	1.22	.60
6.....	.14	.26	.44	.68	.62	1.38	2.14	4.54	4.76	2.88	1.20	.56
7.....	.12	.28	.46	.71	.60	1.40	2.16	4.80	4.70	2.80	1.18	.54
8.....	.14	.32	.44	.74	.60	1.34	2.20	4.94	4.64	2.74	1.14	.52
9.....	.10	.30	.46	.70	.62	1.36	2.22	5.12	4.60	2.68	1.12	.55
10.....	.11	.35	.46	.66	.64	1.38	2.32	5.26	4.58	2.62	1.08	.54
11.....	.11	.35	.50	.70	.62	1.36	2.34	5.42	4.58	2.52	1.04	.50
12.....	.10	.35	.46	.68	.62	1.34	2.52	5.50	4.58	2.44	1.05	.50
13.....	.09	.36	.48	.67	.62	1.34	2.68	5.58	4.56	2.36	1.00	.48
14.....	.08	.38	.46	.66	.60	1.36	2.82	5.62	4.60	2.28	1.00	.48
15.....	.08	.42	.44	.66	.60	1.36	3.20	5.64	4.60	2.20	.98	.46
16.....	.08	.47	.45	.64	.60	1.36	3.38	5.62	4.60	2.18	.96	.44
17.....	.08	.48	.52	.64	.60	1.38	3.68	5.54	4.62	2.16	.96	.40
18.....	.08	.48	.60	.72	.60	1.40	3.76	5.48	4.44	2.03	.96	.38
19.....	.08	.52	.58	.74	.58	1.42	3.90	5.48	4.38	1.98	.96	.40
20.....	.06	.54	.58	.76	.56	1.46	3.96	5.56	4.28	1.96	.94	.40
21.....	.06	.54	.60	.80	.54	1.46	3.96	5.58	4.20	1.90	.88	.38
22.....	.10	.52	.62	.78	.54	1.42	3.96	5.86	4.14	1.82	.85	.38
23.....	.14	.50	.66	.70	.54	1.44	4.00	5.94	4.10	1.78	.82	.36
24.....	.16	.50	.68	.68	.54	1.54	4.08	5.90	3.96	1.74	.80	.36
25.....	.17	.58	.66	.66	.54	1.54	4.08	5.80	3.96	1.70	.78	.36
26.....	.18	.54	.64	.66	.61	1.52	4.10	5.58	3.80	1.66	.76	.34
27.....	.20	.50	.68	.64	.72	1.54	4.12	5.50	3.68	1.60	.74	.34
28.....	.22	.44	.66	.65	.84	1.56	4.12	5.22	3.60	1.56	.74	.32
29.....	.23	.44	.64	.66	.94	1.60	4.18	5.10	3.52	1.48	.72	.32
30.....	.24	.43	.62	.64	-----	1.64	4.20	4.90	3.46	1.46	.70	.34
31.....	.22	-----	.64	.62	-----	1.66	-----	4.85	-----	1.42	.68	-----

## PRIEST RIVER AT OUTLET OF PRIEST LAKE, NEAR COOLIN, IDAHO

LOCATION.—Water-stage recorder in SW¼ sec. 5, T. 59 N., R. 4 W., at southwest end of Priest Lake, 2 miles northwest of Coolin. Zero of gage is 2,435.06 feet above mean sea level, United States Coast and Geodetic Survey datum, or 2,437.99 feet, United States Geological Survey datum.

DRAINAGE AREA.—572 square miles.

RECORDS AVAILABLE.—June 1911 to September 1918 (fragmentary); May 1919 to September 1932.

EXTREMES.—Maximum discharge during year, 6,890 second-feet May 23 (gage height, 5.29 feet); minimum, 144 second-feet Oct. 20, 21 (gage height —0.06 foot).

1911–32: Maximum discharge, 7,290 second-feet May 30, 1917 (gage height, 6.83 feet); minimum discharge, 120 second-feet Dec. 7, 1929; minimum gage height, that of Oct. 20, 21, 1931.

REMARKS.—Records excellent except those estimated, which are good. No diversions above station.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	169	195	251	344	353	573	954	3,880	4,870	2,700	* 7.9	394
2.....	169	195	251	344	349	638	1,020	3,880	4,870	2,560	* 7.9	389
3.....	166	198	258	340	344	678	1,120	3,970	5,040	2,420	6.71	379
4.....	166	198	261	340	344	700	1,220	4,060	5,040	2,350	6.57	365
5.....	166	204	265	344	340	728	1,290	4,220	4,870	2,280	6.36	351
6.....	166	204	269	344	340	735	1,350	4,480	4,870	2,140	6.23	338
7.....	166	208	276	344	344	735	1,350	4,740	4,700	2,080	6.10	329
8.....	166	220	287	340	349	735	1,400	5,100	4,700	2,140	6.03	316
9.....	160	220	287	344	353	728	1,350	5,370	4,530	1,880	5.55	304
10.....	157	230	295	344	353	721	1,200	5,640	4,530	1,760	5.53	300
11.....	155	230	291	349	353	714	1,300	5,820	4,530	1,700	5.46	292
12.....	149	230	287	* 335	353	714	1,300	6,130	4,530	1,640	5.34	288
13.....	146	244	287	* 330	344	707	1,620	6,130	4,530	1,520	5.34	284
14.....	146	261	284	* 330	340	721	2,030	6,320	4,530	1,470	5.32	280
15.....	146	272	276	331	335	728	2,570	6,320	4,530	1,420	5.15	276
16.....	* 146	272	272	335	331	728	2,940	6,320	4,360	1,380	4.74	272
17.....	146	276	287	335	327	735	3,240	6,320	4,360	1,360	4.75	265
18.....	146	276	303	357	315	742	3,240	6,130	4,190	1,280	4.71	254
19.....	146	284	303	371	307	758	3,320	6,130	4,110	1,230	4.55	250
20.....	144	291	303	371	303	780	3,400	* 6,150	3,950	1,180	4.44	254
21.....	144	284	* 310	371	303	788	3,400	6,320	3,870	1,140	4.34	250
22.....	152	280	* 315	371	303	795	3,400	6,700	3,790	1,100	4.18	246
23.....	166	276	* 320	366	303	810	3,480	6,890	3,710	1,040	4.3	239
24.....	169	272	* 325	366	315	834	3,560	6,700	3,630	1,000	4.3	236
25.....	172	276	* 330	362	323	858	3,640	6,510	3,470	960	4.08	232
26.....	177	272	* 335	362	344	842	3,640	6,320	3,310	933	4.13	228
27.....	183	261	340	366	385	826	3,640	5,940	3,230	906	3.78	225
28.....	186	258	349	366	446	866	3,640	5,580	3,080	854	3.70	222
29.....	186	251	349	* 360	495	898	3,720	5,400	2,930	813	3.74	218
30.....	186	251	344	* 355	-----	898	3,800	5,220	2,780	796	3.70	218
31.....	189	-----	344	* 355	-----	922	-----	5,040	-----	* 7.70	3.34	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	A cre-feet
October.....	189	144	162	0.283	0.33	9,960
November.....	291	195	246	.430	.48	14,600
December.....	349	251	299	.523	.60	18,400
January.....	371	330	351	.614	.71	21,600
February.....	495	303	345	.603	.65	19,800
March.....	922	573	762	1.33	1.53	46,900
April.....	3,800	954	2,440	4.27	4.76	145,000
May.....	6,890	3,880	5,600	9.79	11.29	344,000
June.....	5,040	2,780	4,180	7.31	8.16	249,000
July.....	2,700	770	1,510	2.64	3.04	92,800
August.....	750	384	510	.892	1.03	31,400
September.....	394	218	283	.495	.55	16,800
The year.....	6,890	144	1,390	2.43	33.13	1,010,000

\* Estimated.



## PRIEST RIVER NEAR PRIEST RIVER, IDAHO

LOCATION.—Water-stage recorder in W½ sec. 11, T. 56 N., R. 5 W., 500 feet below Saddler Creek, a quarter of a mile below mouth of Lower West Branch, 2½ miles north of Priest River, and 3½ miles above mouth.

RECORDS AVAILABLE.—October 1930 to September 1932. At site 3 miles downstream June 1903 to April 1905, November 1910 to April 1911, May to December 1923, February 1929 to September 1930.

EXTREMES.—Maximum discharge during year, 8,890 second-feet May 23 (gage height, 8.03 feet); minimum, 195 second-feet Oct. 14 (gage height, 0.90 foot). 1903-5, 1910-11, 1923, 1929-32: Maximum discharge, that of May 23, 1932; minimum discharge, 195 second-feet Dec. 31, 1930. Oct. 14, 1931; minimum gage height, 0.72 foot Dec. 31, 1930.

REMARKS.—Records good except those estimated, Nov. 1 to May 11, June 26, 27, July 15-17, Sept. 16-30, which are fair. No diversion above station.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	246	311	440	490	490	750	2,500	5,650	6,020	3,130	984	492	
2.....	250	303				850	2,700	5,700	6,170	3,010	944	488	
3.....	250	296				890		5,700	6,320	2,890	868	468	
4.....	254	296				910		5,800	6,320	2,830	838	456	
5.....	292	292				925	2,900	6,000	6,170	2,770	810	450	
6.....	292	299	460	490	480			6,300	6,020	2,600	824	450	
7.....	275	339						6,600	5,870	2,500	810	450	
8.....	258	347					940	3,000	6,800	5,720	2,380	803	445
9.....	241	355						7,100	5,580	2,330	775	435	
10.....	233	351						2,800	7,400	5,580	2,220	726	435
11.....	233	351	470	500	930	2,900	7,600	5,580	2,070	719	430		
12.....	229	347				3,000	7,880	5,580	2,020	719	420		
13.....	233	384				3,200	7,880	5,580	1,970	705	420		
14.....	221	498				920	3,800	8,040	5,580	1,920	684	415	
15.....	225	471				940	4,400	8,040	5,580	1,830	670	405	
16.....	225	453	460	480	486	970	4,800	7,880	5,580	1,750	649	400	
17.....	221	422				1,060	5,100	7,560	5,440	1,660	642	395	
18.....	221	422				1,150	5,100	7,560	5,160	1,570	635	390	
19.....	221	430				1,200	5,200	7,400	5,020	1,520	628	380	
20.....	217	440				1,350		7,400	4,880	1,480	609	380	
21.....	217	453	510	510	470	1,500	5,300	7,880	4,740	1,380	590	380	
22.....	250					1,600		8,550	4,600	1,380	590	370	
23.....	332	450				1,700		8,890	4,600	1,340	576	367	
24.....	341					500	1,800	5,350	8,720	4,320	1,300	564	363
25.....	300					520	1,900	5,300	8,210	4,320	1,250	552	360
26.....	323	440	510	500	550	1,800	5,400	7,880	4,100	1,200	540	355	
27.....	327					600	1,700	5,480	7,400	3,800	1,160	528	350
28.....	360					650	1,800	5,500	6,920	3,510	1,120	516	346
29.....	346					700	1,900	5,580	6,620	3,380	1,070	492	343
30.....	314						2,050	5,600	6,320	3,250	1,040	492	343
31.....	288		490			2,300		6,170		1,020	498		

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	360	217	266	0.295	0.34	16,400
November.....	498	292	395	.438	.49	23,500
December.....			480	.532	.61	29,500
January.....			490	.543	.63	30,100
February.....	700		506	.561	.60	29,100
March.....	2,300	750	1,270	1.41	1.63	78,100
April.....	5,600	2,500	4,180	4.63	5.17	249,000
May.....	8,890	5,650	7,540	8.36	9.64	464,000
June.....	6,320	3,250	5,150	5.71	6.37	306,000
July.....	3,130	1,020	1,880	2.06	2.38	114,000
August.....	984	492	677	.751	.87	41,600
September.....	492	343	406	.460	.50	24,200
The year.....	8,890	217	1,940	2.15	29.23	1,410,000

## SHEEP CREEK BASIN

## SHEEP CREEK NEAR VELVET, WASH.

LOCATION.—Water-stage recorder in SE¼NW¼ sec. 20, T. 40 N., R. 39 E., about 3½ miles above confluence with Little Sheep Creek and 4 miles southwest of Velvet. Zero of gage is 2,100.00 feet above mean sea level.

DRAINAGE AREA.—171 square miles.

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

EXTREMES.—Maximum discharge during year, 1,470 second-feet Apr. 15 (gage height, 8.66 feet); minimum occurred during winter.

1929-32: Maximum discharge, that of Apr. 15, 1932; minimum, 1.7 second-feet Nov. 24, 1930 (gage height, 3.26 feet).

REMARKS.—Records fair except those estimated because of ice, Nov. 22-31, which are poor. Discharge also estimated Apr. 1-6, 20-30. No records December to March. Flow partly regulated by flash dam half a mile above gage. No diversions. Some discharge measurements furnished by Sheep Creek Hydroelectric Co.

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

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept
1	22	24		1,160	578	112	37	26
2	22	24		1,120	595	104	36	25
3	22	24		1,120	630	99	35	25
4	22	24	550	1,190	648	102	35	24
5	24	24		1,270	630	102	33	23
6	24	23		1,350	578	94	32	22
7	23	23	476	1,390	542	88	32	22
8	22	24	461	1,350	508	83	31	22
9	22	24	446	1,310	508	79	30	21
10	22	24	461	1,310	508	75	30	21
11	21	24	505	1,310	508	71	30	20
12	22	24	580	1,190	490	69	35	20
13	21	28	748	1,120	472	65	36	20
14	21	32	1,050	1,120	472	63	33	19
15	20	32	1,430	1,050	448	61	32	18
16	20	30	1,310	945	416	60	31	18
17	20	28	1,190	910	378	59	30	18
18	20	28	1,120	875	334	58	28	18
19	20	28	1,050	910	302	55	28	18
20	20	24	1,020	910	274	54	27	
21	20	26	945	1,120	255	51	26	
22	25		875	1,160	237	49	26	
23	30		875	1,120	225	47	26	
24	26	24	945	980	210	45	26	
25	25		980	875	190	44	26	20
26	29		980	805	171	43	26	
27	28		1,020	700	158	41	25	
28	26	23	1,020	648	146	40	25	
29	25		1,080	595	133	39	26	
30	24		1,160	578	121	38	27	
31	24			560		37	27	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	30	20	23.0	0.135	0.16	1,410
November	32		25.1	.147	.16	1,490
April	1,430		834	4.88	5.44	49,600
May	1,390	560	1,030	6.02	6.94	63,300
June	648	121	389	2.27	2.53	23,100
July	112	37	65.4	.382	.44	4,020
August	37	25	28.9	.175	.20	1,840
September	26		20.7	.121	.14	1,230

NOTE.—Discharge, 23.8 second-feet Jan. 16, result of discharge measurement.

## SHEEP CREEK NEAR NORTHPORT, WASH.

LOCATION.—Water-stage recorder in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 25, T. 40 N., R. 39 E., at county highway bridge 1 mile above mouth and 1 $\frac{1}{2}$  miles north of Northport. Zero of gage is 1,300.00 feet above mean sea level.

DRAINAGE AREA.—225 square miles.

RECORDS AVAILABLE.—June 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 2,130 second-feet Apr. 15 (gage height, 27.1 feet); minimum occurred during period of ice effect.

1929-32: Maximum discharge, that of Apr. 15, 1932; minimum, probably less than 8 second-feet, occurred during period Dec. 25, 1929, to Apr. 7, 1930.

REMARKS.—Records good except those estimated for periods of ice effect, Nov. 22-24, Nov. 27 to Dec. 18, 1931, Jan. 1-17, Jan. 21 to Mar. 17, 1932, which are poor. Flow partly regulated by flash dam 6 $\frac{1}{2}$  miles above gage. No diversions. Many discharge measurements furnished by Sheep Creek Hydroelectric Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31												
1.....	88	28	32	19	25	24	151	1,010	267	303	30	23
2.....	16	28	14	20	25	24	158	1,180	210	277	117	28
3.....	11	27	42	20	25	25	153	1,260	159	238	45	25
4.....	11	27	27	20	22	25	158	1,220	187	267	50	40
5.....	11	27	25	21	22	26	169	1,120	246	254	106	30
6.....	12	27	25	21	22	26	206	1,040	137	229	32	31
7.....	101	26	24	21	21	26	292	1,040	203	259	21	34
8.....	18	26	24	22		26	390	975	186	98	94	33
9.....	14	26	23	22		26	411	816	148	200	25	34
10.....	14	25	22	22	20	26	428	705	54	171	23	34
11.....	14	25	23	22		26	406	633	125	133	23	34
12.....	14	27	23	23	21	26	388	644	122	135	120	34
13.....	14	28	24	23	21	27	384	725	167	194	61	32
14.....	18	28	24	23	21	28	388	798	78	60	48	28
15.....	19	27	24	23	22	28	388	834	91	230	45	36
16.....	22	27	24	23	21	29	378	798	184	60	44	32
17.....	22	26	24	22	22	31	392	710	137	177	42	30
18.....	23	25	20	22	22	34	417	640	276	85	41	30
19.....	25	22	20	22	22	44	413	556	299	97	40	30
20.....	24	23	21	22	23	58	395	488	353	97	39	29
21.....	25	23	21	22	23	86	392	431	460	96	38	30
22.....	25	24	21	23	24	125	399	395	399	91	38	30
23.....	25	24	20	24	24	167	399	374	381	88	36	30
24.....	24	23	21	24	24	188	410	360	277	83	36	30
25.....	24	14	19	24	24	191	442	346	280	62	34	32
26.....	25	11	20	24	24	184	484	330	299	103	33	31
27.....	25	11	18	24	24	167	536	312	378	37	32	31
28.....	137	11	18	24	24	155	616	293	254	99	32	30
29.....	39	11	18	24		147	715	273	312	76	27	30
30.....	32	42	19	24		142	840	257	389	25	29	29
31.....	30		18	25		142		163		23	30	

Discharge, in second-feet, of Sheep Creek near Northport, Wash., 1930-32—Contd.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1.....	29	30	22	30	20	34	529	1,700	650	141	51	38
2.....	29	30					650		687	136	50	37
3.....	28	30					792		730	136	48	36
4.....	29	30					822		740	139	46	35
5.....	31	29					780		696	136	45	35
6.....	31	28	23	29	27	34	715	1,900	650	125	44	34
7.....	30	28					662		603	118	44	34
8.....	29	29					629		570	110	43	32
9.....	29	30					612		562	104	41	32
10.....	29	31					629		558	98	41	32
11.....	28	30	25	27	26	69	687	1,450	562	94	45	31
12.....	30	30					828		549	90	49	31
13.....	29	36					1,150		541	87	48	31
14.....	29	41					1,740		520	84	45	30
15.....	28	40					2,060		508	83	43	29
16.....	28	38	35	28	31	105	1,850	1,080	472	81	42	29
17.....	28	36					1,680		424	80	41	29
18.....	28	34					1,570		380	77	40	29
19.....	28	35					1,540		345	73	39	31
20.....	28	33	33	28	33	136	1,430	1,180	314	70	39	33
21.....	27	32	34	25	35	152	1,290	1,600	201	64	39	33
22.....	33	33	34				1,671	1,680	273	62	39	32
23.....	36	28	34				1,220	1,540	255	56	38	31
24.....	34	34	34				1,320	1,320	238	58	38	31
25.....	33	24	34			196	1,400	1,120	219	57	36	31
26.....	36	23	34	21	35	210	1,400	940	199	56	35	30
27.....	35	34	34				216	822	184	55	36	29
28.....	34	23	33				262	725	169	54	35	29
29.....	32		34				329	679	158	53	38	29
30.....	32		32				376	650	150	52	39	29
31.....	31		32			440		641		52	38	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1930-31						
October.....	137	11	29.1	0.129	0.15	1,790
November.....	42	11	24.0	.107	.12	1,430
December.....	42	14	22.5	.100	.12	1,380
January.....	25	19	22.4	.100	.12	1,380
February.....	25		22.4	.100	.10	1,240
March.....	191	24	73.5	.327	.38	4,520
April.....	840	151	390	1.73	.193	23,200
May.....	1,260	163	669	2.97	3.42	41,100
June.....	460	54	235	1.04	1.16	14,000
July.....	303	23	140	.622	.72	8,610
August.....	120	21	45.5	.202	.23	2,800
September.....	40	23	31.0	.138	.15	1,840
The year.....	1,260	11	143	.636	8.60	103,000
1931-32						
October.....	36	27	30.4	0.135	0.16	1,870
November.....	41		30.1	.134	.15	1,790
December.....	35		28.1	.125	.14	1,740
January.....			26.5	.118	.14	1,630
February.....			29.0	.129	.14	1,670
March.....	440		125	.556	.64	7,690
April.....	2,060	529	1,180	5.24	5.85	70,200
May.....		641	1,380	6.13	7.07	84,800
June.....	740	150	440	1.96	2.19	26,200
July.....	141	52	86.5	.384	.44	5,320
August.....	51	35	41.8	.156	.21	2,270
September.....	38	29	31.7	.141	.16	1,890
The year.....	2,060		286	1.27	17.29	207,000

NOTE.—Records for year ending Sept. 30, 1931, supersede those published in Water-Supply Paper 722.

## KETTLE RIVER BASIN

## KETTLE RIVER NEAR FERRY, WASH.

(International gaging station)

LOCATION.—Water-stage recorder in lot 7, sec. 10, T. 40 N., R. 32 E.,  $1\frac{1}{4}$  miles south of international boundary and Ferry. Zero of gage is 1,840.00 feet above mean sea level.

DRAINAGE AREA.—2,220 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 10,300 second-feet May 22 (gage height, 17.03 feet); minimum, 69 second-feet Jan. 14 (gage height, 9.12 feet). 1928-32: Maximum discharge, that of May 22, 1932; minimum, 14 second-feet Jan. 23, 1930, result of current-meter measurement, may have been less during period Jan. 18-23, 1930.

REMARKS.—Records excellent except those for Jan. 31 to Feb. 6, which were estimated because of ice. Numerous small diversions above station for irrigation. This is one of the international gaging stations maintained by the United States under agreement with Canada.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	158	170	115	131	90	239	602	6,960	5,730	2,060	326	208
2.....	151	174	120	142		253	785	6,780	6,960	1,880	326	224
3.....	151	187	131	148		253	964	6,960	8,780	1,720	331	245
4.....	148	204	145	151		240	1,120	7,320	8,220	1,660	318	257
5.....	145	215	158	151		253	1,160	8,040	7,140	1,720	291	242
6.....	142	215	164	154	108	252	1,120	8,590	6,070	1,500	278	226
7.....	145	208	164	151		235	1,100	8,970	5,900	1,350	261	219
8.....	151	208	158	145		223	1,070	9,160	5,900	1,200	249	201
9.....	161	215	148	148		216	1,040	8,970	6,240	1,110	242	201
10.....	167	223	142	145		234	1,050	8,540	6,420	1,020	234	198
11.....	164	204	140	142	113	224	1,160	9,540	6,960	948	234	194
12.....	167	198	134	124	113	221	1,450	8,780	7,140	908	238	187
13.....	167	201	120	97	118	248	2,240	8,780	7,500	860	350	184
14.....	161	215	115	80	106	270	4,210	9,350	7,680	828	602	180
15.....	161	230	126	94	108	270	5,730	8,220	8,040	908	500	174
16.....	158	230	131	106	108	278	5,390	7,140	7,500	836	434	167
17.....	154	223	134	120	111	282	5,390	6,780	6,240	778	365	161
18.....	151	208	145	123	108	295	5,050	6,780	5,390	736	331	154
19.....	151	190	151	123	111	304	4,880	6,780	4,710	694	304	151
20.....	148	180	161	131	115	322	4,710	7,680	4,370	687	282	151
21.....	148	142	167	134	113	345	4,210	9,540	4,370	650	270	158
22.....	151	124	170	131	113	350	3,900	10,100	4,540	602	257	167
23.....	164	122	174	120	118	365	3,900	9,160	4,370	554	257	167
24.....	164	137	177	120	134	375	4,370	7,680	4,050	524	257	174
25.....	164	158	174	120	145	385	4,880	6,600	3,600	489	266	190
26.....	167	161	174	123	177	385	5,390	5,730	3,220	456	261	313
27.....	170	115	180	118	194	390	5,900	5,050	2,940	434	253	336
28.....	170	94	180	111	185	396	6,420	4,710	2,730	401	245	295
29.....	174	108	167	108	222	434	7,140	4,710	2,540	375	238	261
30.....	174	115	145	102	-----	472	7,140	4,880	2,300	360	223	245
31.....	170	-----	137	100	-----	518	-----	5,220	-----	345	208	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	174	142	159	9,780
November.....	230	94	179	10,700
December.....	180	115	150	9,220
January.....	154	80	126	7,750
February.....	222	-----	121	6,960
March.....	618	216	307	18,900
April.....	7,140	602	3,450	205,000
May.....	10,100	4,710	7,560	465,000
June.....	8,780	2,300	5,580	332,000
July.....	2,602	345	922	56,700
August.....	602	208	208	15,800
September.....	336	151	208	12,400
The year.....	10,100	-----	1,590	1,160,000

## KETTLE RIVER AT CASCADE, BRITISH COLUMBIA

(International gaging station)

LOCATION.—Staff gage on highway bridge half a mile below Cascade Falls, at Cascade.

DRAINAGE AREA.—3,550 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932; April 1916 to September 1929 in Canadian Water-Resources Papers.

EXTREMES.—Maximum discharge during year, 17,400 second-feet May 11 (gage height, 9.5 feet); minimum probably occurred during period of ice effect.

1916-32: Maximum discharge, 29,300 second-feet June 8, 1921; minimum, 60 second-feet Jan. 24, 25, 1930.

REMARKS.—Records good except those estimated for period of ice effect, Nov. 22 to Mar. 11, which are fair. Numerous diversions above station for irrigation. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	360	318	295	300	188	527	1,580	11,200	9,220	3,760	519	365
2	355	318	300	295	190	530	2,150	11,000	9,770	3,420	506	365
3	345	315	300	300	190	530	2,600	11,100	12,400	3,250	500	385
4	340	336	304	300	190	530	2,800	11,800	12,800	2,990	519	390
5	340	355	308	295	195	500	2,880	12,700	12,100	2,990	458	415
6	336	370	308	295	195	450	2,800	13,800	10,100	2,740	446	400
7	336	380	308	265	195	450	2,650	14,400	9,220	2,520	430	390
8	322	390	308	255	195	400	2,530	16,200	9,400	2,350	410	380
9	331	395	308	250	195	400	2,490	15,900	9,660	2,100	405	365
10	336	415	308	210	195	350	2,600	16,000	10,100	1,990	380	345
11	336	415	295	203	200	350	2,580	17,400	10,800	1,790	375	336
12	336	400	295	195	200	318	2,880	15,600	11,300	1,700	390	360
13	331	395	300	195	202	313	3,910	15,000	11,500	1,650	390	336
14	331	415	286	195	200	350	6,380	15,700	12,100	1,570	440	331
15	322	425	295	195	200	345	10,700	15,000	12,100	1,530	807	318
16	318	440	300	195	200	365	10,000	12,600	12,500	1,600	724	318
17	313	440	304	195	200	390	9,300	11,800	11,100	1,500	630	308
18	304	430	318	195	225	385	9,090	11,700	9,550	1,400	565	300
19	304	415	318	195	225	425	8,340	11,800	8,120	1,300	506	295
20	300	390	322	195	250	400	8,480	12,100	7,430	1,220	470	300
21	295	375	328	189	250	430	7,680	15,200	7,180	1,190	452	300
22	300	355	313	189	275	470	6,980	17,200	7,260	1,120	440	295
23	313	322	300	189	275	700	6,780	15,400	7,120	1,040	415	304
24	304	300	313	189	300	831	7,880	13,200	6,860	975	415	318
25	308	300	304	189	300	901	8,280	11,800	6,460	898	400	318
26	326	300	295	189	300	928	8,680	10,300	5,740	834	400	326
27	318	300	290	189	350	946	9,400	8,890	5,260	672	405	400
28	318	295	300	189	350	1,000	9,820	8,080	4,560	665	395	458
29	318	295	277	189	400	1,090	10,700	7,720	4,520	679	390	430
30	318	295	259	189	-----	1,260	11,500	8,120	4,140	679	385	405
31	318	-----	295	189	-----	1,400	-----	8,120	-----	665	375	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	360	295	324	19,900
November	440	295	363	21,600
December	328	259	302	18,600
January	300	189	219	13,500
February	400	188	236	13,600
March	1,400	313	589	36,200
April	11,500	1,580	6,150	366,000
May	17,400	7,720	12,800	787,000
June	12,800	4,140	9,020	537,000
July	3,760	665	1,700	105,000
August	807	375	463	28,500
September	458	295	351	20,900
The year	17,400	188	2,710	1,970,000

## KETTLE RIVER NEAR LAURIER, WASH.

(International gaging station)

LOCATION.—Water-stage recorder in SW¼ sec. 11, T. 40 N., R. 36 E., 500 feet below Deep Creek and 1½ miles southeast of Laurier.

DRAINAGE AREA.—3,800 square miles.

RECORDS AVAILABLE.—September 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 19,200 second-feet May 11 (gage height, 13.2 feet); minimum occurred during January or February, when stage-discharge relation was affected by ice.

1929-32: Maximum discharge (revised), that of May 11, 1932; minimum occurred during winter of 1929-30.

Maximum stage known, about 22 feet in 1894.

REMARKS.—Records excellent except those represented by braced figures and for Nov. 14, 15, Dec. 31, 1929, Nov. 23, 24, 1931, which were estimated. North Fork regulated by storage above dam at Grand Forks, British Columbia. Numerous small diversions for irrigation and domestic use. Records for years ending Sept. 30, 1930 and 1931, supersede those published in Water-Supply Papers 707 and 722. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

*Discharge, in second-feet, 1929-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1929-30												
1	162	228	185	90	80	160	360	5,220	7,260	2,780	590	223
2	165	223	158				444	4,940	6,900	2,650	565	223
3	165	223	130				660	4,750	6,000	2,590	530	223
4	165	270	124				950	4,940	6,000	2,410	512	223
5	158	255					1,060	4,750	5,800	2,290	493	218
6	158	250		70	90	190	1,060	4,570	5,410	2,060	465	214
7	158	232					1,140	4,570	5,600	1,950	437	210
8	158	228					1,500	4,130	6,700	1,790	423	210
9	165	223					1,950	3,800	6,800	1,690	395	205
10	177	218	140				2,170	3,560	5,500	1,590	374	201
11	177	210		70	90	190	2,170	3,560	5,410	1,500	360	193
12	177	197					2,230	3,560	5,220	1,450	360	193
13	179	185					2,410	3,560	4,660	1,360	342	197
14	181	170					2,910	3,640	4,220	1,270	330	197
15	181	180					4,650	4,040	3,800	1,180	324	197
16	181	197	169	70	130	255	5,800	4,840	3,640	1,100	318	197
17	181	201	181				5,030	5,410	3,560	1,020	300	193
18	181	197	173				4,390	5,600	3,330	950	290	193
19	189		173				250	4,220	5,030	3,040	915	181
20	189		169				255	3,880	4,390	2,910	880	177
21	189		169	70	130	255	3,880	4,390	2,980	880	280	173
22	205		173				4,220	4,480	3,110	850	280	173
23	205		173				4,940	3,960	3,260	820	280	173
24	205	180	173				5,600	3,640	3,480	760	275	169
25	201		177				6,200	3,480	3,330	736	265	165
26	197		177	70	130	255	6,200	3,480	3,040	706	260	173
27	197		173				6,200	3,260	2,980	675	250	173
28	201		140				6,600	3,180	3,180	665	246	177
29	205		148				6,400	3,480	3,180	655	236	181
30	228	185	137				5,800	4,300	2,980	642	228	181
31	232		140			306		5,120		618	223	

Discharge, in second-feet, of Kettle River near Laurier, Wash., 1929-32—Contd.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1930-31													
1	173	228	214	170	236	255	985	7,400	7,610	4,660	736	241	
2	181	223	218		236	255	1,060	8,450	7,400	4,480	695	236	
3	185	223	223		236	260	1,140	9,920	7,000	4,130	670	236	
4	193	223	223		232	280	1,140	10,800	6,000	3,880	642	232	
5	189	218	223		214	275	1,180	10,800	5,410	3,560	618	232	
6	193	214	228	185	223	265	1,360	10,400	5,030	3,330	595	236	
7	193	214	232	189	210	270	1,880	11,500	4,940	3,110	570	241	
8	218	218	236	193	190	275	2,840	11,700	4,840	2,910	560	241	
9	214	218	236	197		275	3,110	9,710	4,750	2,650	548	270	
10	205	210	232	193		280	2,840	8,240	4,660	2,470	530	388	
11	214	214	228	193		285	2,650	7,610	5,410	2,290	524	402	
12	218	228	223	193		295	2,590	8,240	4,940	2,170	500	402	
13	223	228	223	193	190	300	2,530	9,920	4,130	2,060	472	381	
14	223	232	218	197		312	2,530	12,200	3,640	2,060	451	374	
15	223	236	218	197		324	2,530	14,000	3,330	2,060	430	465	
16	214	236	218	189		330	2,470	14,000	3,180	1,950	416	530	
17	214	236	214	189		342	2,470	13,000	3,400	1,840	402	548	
18	232	236	177	193	223	381	2,650	10,800	5,580	1,690	381	542	
19	223	218	185	193	241	486	2,650	8,660	7,000	1,590	360	542	
20	223	210	201	181	255	634	2,530	7,400	6,200	1,500	348	536	
21	214	232	185	177	250	742	2,470	6,600	6,400	1,360	330	518	
22	210	241	188	189	250	915	2,530	6,000	6,000	1,270	318	506	
23	210	241	236	197	255	1,100	2,650	5,800	6,200	1,180	306	506	
24	214	241	197	201	255	1,180	2,780	6,000	6,000	1,100	300	493	
25	210	236	229	201	255	1,180	3,110	6,200	5,410	1,020	290	479	
26	210	236	201	197	250	1,180	3,480	6,800	4,940	985	280	466	
27	214	236	205	210	250	1,140	3,960	6,800	5,220	915	265	451	
28	210	210	214	214	255	1,060	4,570	6,600	5,220	880	260	430	
29	214	205	160	218	223	1,020	5,410	6,200	4,940	820	255	409	
30	218	210		223		985	6,400	6,600	4,660	790	250	402	
31	228	320	381	236		950	550	7,200	760	760	246	423	
1931-32													
1	388	336		320	280	465	1,740	13,000	8,660	3,960	655	416	
2	374	342					2,350	12,700	10,800	3,560	580	444	
3	360	342					2,840	13,000	13,200	3,330		451	
4	354	348					2,910	13,800	13,500	3,110		479	
5	348	374					2,780	15,100	12,700	3,110		458	
6	342	395	395	560	280	465	2,910	16,400	11,000	2,910	440	458	
7	342	402	430				2,980	17,300	10,100	2,650		437	
8	342	416	530				2,910	18,100	10,100	2,410		416	
9	342	444	518				2,840	17,600	10,600	2,230		402	
10	348	458	605				2,780	17,800	11,000	2,060		381	
11	348	472	560	300	230	465	2,980	18,900	11,700	1,950	440	374	
12	342	465	3,330				17,600	12,200	1,840	374			
13	342	458	4,500				16,400	12,500	1,790	374			
14	342	479	7,220				17,000	13,000	1,690	360			
15	342	493	11,300				16,200	13,200	1,690	354			
16	336	512	300	230	400	985	479	11,300	13,800	13,200	1,740	354	
17	330	500					518	10,600	12,500	11,700	1,640	700	348
18	324	493					512	10,100	12,500	9,920	1,540	655	330
19	318	479					530	9,500	12,700	8,660	1,450	614	318
20	324	444					542	9,500	13,200	7,820	1,400	590	330
21	318	416	300	280	400	985	570	8,660	16,400	7,610	1,360	312	
22	318	359					626	8,030	18,400	7,610	1,270	536	306
23	330	330					820	7,820	17,600	7,610	1,180	518	312
24	324	330					915	8,870	14,800	7,200	1,140	512	330
25	324	348					985	9,290	12,500	6,600	1,060	493	360
26	348	354	300	280	400	985	1,020	10,100	10,800	6,000	1,020	493	
27	342	1,020					10,800	9,500	5,410	915	493		
28	336	1,060					11,500	8,660	5,030	820	479		
29	336	1,220					12,500	8,450	4,660	820	465		
30	336	1,360					13,200	8,660	4,300	820	465		
31	336	1,500					8,870	760	760	437	440		



*Discharge, in second-feet, of Kettle River near Laurier, Wash., 1929-32—Cont*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
<b>1929-30</b>				
October.....	232	158	184	11,
November.....	270	-----	202	12,
December.....	185	124	154	9,
January.....	-----	-----	76.5	4,
February.....	-----	-----	97.9	5,
March.....	306	-----	212	13,
April.....	6,600	3,300	3,500	208,
May.....	5,600	3,180	4,250	261,
June.....	7,260	2,970	4,450	265,
July.....	2,780	618	1,340	82,
August.....	590	223	348	21,
September.....	223	165	194	11,
The year.....	7,260	-----	1,250	905,
<b>1930-31</b>				
October.....	232	177	210	12,
November.....	241	205	225	13,
December.....	236	-----	206	12,
January.....	236	-----	194	11,
February.....	255	-----	222	12,
March.....	1,180	255	575	35,
April.....	6,490	985	2,680	159,
May.....	14,000	5,800	8,890	547,
June.....	7,610	3,180	5,310	316,
July.....	4,660	760	2,110	130,
August.....	738	246	437	26,
September.....	548	232	398	23,
The year.....	14,000	-----	1,800	1,300,
<b>1931-32</b>				
October.....	388	318	340	20,
November.....	512	-----	400	23,
December.....	605	-----	339	20,
January.....	-----	-----	230	14,
February.....	-----	-----	338	19,
March.....	1,500	-----	705	42,
April.....	13,200	1,740	6,940	413,
May.....	18,900	8,450	14,200	873,
June.....	13,500	4,300	9,590	571,
July.....	3,960	760	1,850	114,
August.....	750	-----	540	33,
September.....	-----	306	388	23,
The year.....	18,900	-----	2,990	2,170,

## MYERS CREEK NEAR MYNCASTER, BRITISH COLUMBIA

(International gaging station)

LOCATION.—Water-stage recorder 50 feet north of international boundary and a quarter of a mile south of Myncaster.

DRAINAGE AREA.—80 square miles.

RECORDS AVAILABLE.—October 1929 to September 1932; May 1923 to September 1929 in Canadian water-resources papers.

EXTREMES.—Maximum discharge during year, 43.6 second-feet May 22 (gage height, 1.34 feet); minimum, 0.7 second-foot Oct. 1, 2.

1923-32: Maximum discharge, 99 second-feet June 14, 1923; no flow July 16-18, 25, 1926.

REMARKS.—Records good. Diversion above station for irrigation of about 50 acres. No record during winter. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

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

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	0.7	2.3	11.5	17.4	19.3	4.8	2.1	1.3
2	.7	2.3	11.2	18.2	19.7	4.4	1.9	1.3
3	1.1	2.4	10.8	20.4	20.4	4.7	1.7	1.3
4	1.1	2.4	10.5	24.2	19.3	4.8	1.3	1.2
5	1.1	2.4	9.8	26.9	18.9	4.4	1.3	1.1
6	1.2	2.4	9.1	29.2	18.5	4.0	1.2	1.1
7	1.2	2.4	9.1	33.4	16.7	3.8	1.1	1.0
8	1.4	2.6	8.8	35.4	15.6	3.4	1.3	.8
9	1.4	2.6	8.8	35.0	14.1	3.2	1.3	.8
10	1.4	2.6	8.4	33.8	12.2	2.9	1.4	.8
11	1.4	-----	9.1	32.3	11.9	3.0	1.7	.8
12	1.5	-----	9.5	30.7	11.9	2.9	2.0	.9
13	1.6	-----	10.5	33.0	12.6	2.7	2.2	.9
14	1.6	-----	11.5	33.0	15.9	2.8	2.0	1.0
15	1.6	-----	11.5	30.3	15.9	2.8	1.8	1.0
16	1.6	-----	11.2	28.4	16.3	2.4	1.8	1.0
17	1.7	-----	10.8	26.9	15.6	2.1	1.6	1.0
18	1.7	-----	10.8	27.6	14.5	1.8	1.4	1.1
19	1.7	-----	11.2	28.4	13.4	1.2	1.2	1.3
20	1.7	-----	11.5	33.4	12.2	1.9	1.2	1.6
21	1.7	-----	10.8	42.0	11.5	1.9	1.4	1.6
22	2.3	-----	10.1	43.6	10.5	1.6	1.5	1.6
23	2.7	-----	12.2	38.9	10.1	1.5	1.7	1.6
24	2.1	-----	12.2	34.2	9.5	1.5	1.4	1.7
25	2.4	-----	11.2	31.1	8.8	1.4	1.3	1.7
26	2.7	-----	11.9	26.5	8.0	1.5	1.4	1.5
27	2.7	-----	12.6	24.6	7.3	1.2	1.7	1.5
28	2.4	-----	13.4	22.7	6.4	1.3	1.3	1.5
29	2.3	-----	15.6	22.7	5.8	2.2	1.1	1.4
30	2.3	-----	16.7	22.3	4.8	2.3	1.3	1.4
31	2.3	-----	-----	21.6	-----	2.1	1.3	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2.7	0.7	1.7	105
November 1-10	2.6	2.3	2.4	48
April	16.7	8.4	11.1	660
May	43.6	17.4	29.3	1,800
June	20.4	4.8	13.3	791
July	4.8	1.2	2.7	166
August	2.2	1.1	1.5	92
September	1.7	.8	1.2	71

## SPOKANE RIVER BASIN

## COEUR D'ALENE RIVER NEAR CATALDO, IDAHO

LOCATION.—Water-stage recorder in sec. 26, T. 49 N., R. 1 E.,  $1\frac{1}{2}$  miles above Cataldo and 3 miles below South Fork of Coeur d'Alene River. Zero of gage is 2,100.00 feet above mean sea level.

DRAINAGE AREA.—1,220 square miles.

RECORDS AVAILABLE.—April 1911 to December 1912; July 1920 to September 1932.

EXTREMES.—Maximum discharge during year, 22,400 second-feet Apr. 14 (gage height, 49.58 feet); minimum discharge, 179 second-feet Dec. 15; minimum gage height, 37.17 feet Sept. 4.

1911-12, 1920-32: Maximum discharge, 27,600 second-feet Feb. 5, 1925 (gage height, 51.3 feet); minimum, 122 second-feet Dec. 4, 1929; minimum gage height, 37.03 feet Sept. 6, 1931.

REMARKS.—Records fair. Discharge estimated Nov. 27, Dec. 15, Jan. 31 to Feb. 8, July 17-20. No diversions or regulation above station. Gage-height record and results of four discharge measurements furnished by Washington Water Power Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	304	327	243	399	518	8,410	10,400	12,000	4,860	1,360	538	418
2	301	317	233	426	511	6,050	13,200	12,000	5,520	1,320	547	414
3	298	311	246	434	502	4,700	13,300	12,200	6,230	1,360	547	406
4	298	311	263	442	500	3,700	13,200	13,700	6,050	1,590	529	391
5	337	304	260	442	490	3,440	10,800	15,000	5,090	1,390	516	387
6	365	304	260	454	505	3,440	8,410	13,700	5,180	1,250	506	383
7	348	382	266	459	520	3,080	7,390	14,200	4,700	1,180	498	376
8	334	557	266	476	540	2,750	7,190	15,500	4,400	1,110	489	372
9	324	687	260	529	566	2,440	6,800	15,200	4,250	1,080	484	372
10	314	595	257	566	552	2,240	7,590	15,000	4,110	1,040	484	368
11	307	520	254	826	524	2,150	9,690	14,700	4,110	946	502	372
12	301	463	249	1,630	511	2,020	12,900	13,400	3,970	915	516	368
13	295	438	238	2,020	502	1,970	17,100	13,900	3,830	915	511	365
14	289	467	210	1,750	463	2,020	21,500	13,900	3,700	915	498	362
15	286	502	203	1,280	493	2,200	20,300	11,700	3,700	880	489	358
16	280	493	201	1,080	489	2,340	17,100	9,690	3,440	826	463	358
17	277	489	228	946	489	2,640	15,000	8,330	2,970	804	446	365
18	277	493	351	915	489	3,700	14,400	8,830	2,640	782	438	358
19	274	472	506	946	493	7,990	14,400	8,830	2,490	760	430	365
20	268	442	516	915	502	9,250	13,700	9,250	2,290	737	418	395
21	266	362	562	855	524	7,990	12,000	10,100	2,150	714	406	402
22	283	280	610	797	557	6,420	10,100	11,500	2,100	714	410	395
23	320	274	562	661	562	5,520	9,040	12,000	2,020	687	414	387
24	354	292	534	547	595	5,350	8,620	10,100	1,970	666	414	383
25	358	344	498	480	714	6,230	9,250	8,620	1,840	640	406	387
26	391	344	459	538	2,700	6,050	11,000	7,190	1,750	640	402	391
27	418	292	442	625	13,200	5,350	12,400	6,230	1,670	615	406	387
28	399	246	459	615	16,000	5,690	12,200	5,520	1,510	590	402	383
29	391	260	467	557	12,400	8,200	11,500	5,180	1,470	566	402	376
30	368	263	418	502	-----	8,620	11,500	5,020	1,390	552	410	368
31	344	-----	410	520	-----	8,410	-----	5,020	-----	543	414	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	418	266	322	0.264	0.30	19,800
November	687	246	394	.323	.36	23,400
December	610	201	353	.289	.33	21,700
January	2,020	399	762	.625	.72	46,900
February	16,000	463	1,980	1.62	1.75	114,000
March	9,250	1,970	4,850	3.98	4.59	298,000
April	21,500	6,800	12,100	9.92	11.07	720,000
May	15,500	5,020	10,900	8.93	10.30	670,000
June	6,230	1,390	3,400	2.79	3.11	202,000
July	1,590	543	906	.743	.86	55,700
August	547	402	462	.379	.44	28,400
September	418	358	380	.311	.35	22,600
The year	21,500	201	3,060	2.51	34.18	2,220,000

## COEUR D'ALENE LAKE AT COEUR D'ALENE, IDAHO

LOCATION.—Water-stage recorder in sec. 24, T. 50 N., R. 4 W., 500 feet southwest of south end of Eleventh Street, Coeur d'Alene. Zero of gage is 2,100.00 feet above mean sea level.

DRAINAGE AREA.—3,750 square miles.

RECORDS AVAILABLE.—February 1905 to September 1932; April 1908 to February 1905 at St. Joe Boom Co.'s gage at mouth of St. Joe River.

EXTREMES.—Maximum stage during year, 34.20 feet May 15; minimum, 22.05 feet Feb. 24.

1903-32: Maximum stage, 36.0 feet Jan. 3, 1918; minimum, 19.9 feet Oct. 10-12, 1904, Sept. 24, 25, 1905, and Oct. 14 to Nov. 3, 1906.

Maximum stage known, 37.6 feet (from high-water marks) May 31, 1894.

REMARKS.—Records excellent. Considerable storage used by Washington Water Power Co. Regulation affected by Taintor gates and bear-trap dam at Post Falls. Gage-height record furnished by Washington Water Power Co.

Add 2,100.00 feet to gage heights to refer them to originally accepted elevation (2,157.404 feet) of the United States Geological Survey bench mark in southeast corner of Merriam Building (see Water-Supply Paper 672).

*Gage height, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23.42	22.77	23.12	23.85	22.97	26.40	28.92	32.16	30.93	26.40	26.39	25.69
2	23.39	22.76	23.10	23.82	22.94	26.83	29.27	32.25	30.62	26.39	26.36	25.64
3	23.37	22.73	23.10	23.79	22.90	26.92	29.70	32.35	30.37	26.42	26.34	25.61
4	23.34	22.70	23.11	23.73	22.89	26.85	30.15	32.50	30.16	26.47	26.33	25.6
5	23.33	22.70	23.11	23.69	22.88	26.77	30.44	32.73	29.95	26.45	26.30	25.57
6	23.31	22.71	23.09	23.63	22.87	26.80	30.47	33.07	29.75	26.42	26.29	25.54
7	23.28	22.75	23.11	23.57	22.88	26.79	30.37	33.30	29.52	26.39	26.27	25.52
8	23.27	22.83	23.11	23.50	22.88	26.65	30.19	33.46	29.28	26.39	26.27	25.51
9	23.24	22.89	23.11	23.48	22.84	26.44	29.99	33.64	29.05	26.36	26.25	25.44
10	23.20	22.97	23.12	23.43	22.80	26.20	29.82	33.81	28.81	26.38	26.19	25.40
11	23.17	22.99	23.12	23.43	22.72	26.94	29.76	33.94	28.62	26.35	26.20	25.39
12	23.12	23.00	23.11	23.50	22.66	25.68	29.87	34.05	28.42	26.37	26.17	25.34
13	23.10	23.02	23.10	23.60	22.57	25.45	30.21	34.11	28.27	26.39	26.13	25.30
14	23.07	23.08	23.09	23.68	22.55	25.24	30.80	34.16	28.10	26.44	26.12	25.27
15	23.05	23.10	23.05	23.65	22.48	25.13	31.50	34.19	27.97	26.45	26.11	25.23
16	23.01	23.12	23.02	23.62	22.42	25.07	32.12	34.08	27.82	26.47	26.13	25.21
17	22.98	23.17	23.07	23.55	22.38	25.11	32.51	33.80	27.62	26.50	26.11	25.21
18	22.95	23.20	23.13	23.56	22.31	25.44	32.74	33.47	27.43	26.50	26.10	25.16
19	22.90	23.25	23.18	23.52	22.28	26.12	32.94	33.20	27.20	26.49	26.08	25.12
20	22.88	23.24	23.23	23.45	22.24	26.89	33.05	32.99	26.99	26.46	26.05	25.09
21	22.82	23.23	23.33	23.35	22.19	27.40	33.06	32.87	26.77	26.45	26.00	25.06
22	22.81	23.22	23.40	23.24	22.13	27.64	32.93	33.03	26.56	26.47	25.96	25.03
23	22.79	23.21	23.47	23.14	22.07	27.72	32.67	33.34	26.40	26.50	25.93	25.02
24	22.74	23.19	23.53	23.09	22.07	27.80	32.34	33.49	26.32	26.49	25.91	25.02
25	22.73	23.19	23.58	23.07	22.08	27.88	32.00	33.43	26.31	26.49	25.89	24.99
26	22.75	23.18	23.61	23.06	22.41	27.98	31.81	33.19	26.30	26.47	25.86	24.98
27	22.74	23.20	23.67	23.07	23.35	27.97	31.79	32.85	26.30	26.44	25.85	24.95
28	22.76	23.18	23.73	23.07	24.54	28.00	31.88	32.45	26.32	26.46	25.84	24.94
29	22.76	23.15	23.78	23.04	25.63	28.20	32.04	32.05	26.38	26.45	25.80	24.92
30	22.76	23.13	23.78	23.00	-----	28.49	32.10	31.65	26.41	26.40	25.74	24.90
31	22.77	-----	23.81	22.97	-----	28.70	-----	31.27	-----	26.40	25.70	-----

## SPOKANE RIVER AT POST FALLS, IDAHO

LOCATION.—Water-stage recorder in sec. 4, T. 50 N., R. 5 W., a quarter of a mile below power plant of Washington Water Power Co. and 1 mile west of Post Falls. Zero of gage is 2,000 feet above mean sea level.

DRAINAGE AREA.—3,880 square miles.

RECORDS AVAILABLE.—January 1913 to September 1932.

EXTREMES.—Maximum discharge during year, 32,400 second-feet May 13-15 (gage height, 75.7 feet); minimum, 675 second-feet Nov. 6 (gage height, 65.60 feet).

1913-32: Maximum discharge, 39,800 second-feet May 18, 1917 (gage height, 79.20 feet); minimum, 540 second-feet Sept. 5, 1926 (gage height, 65.3 feet).

REMARKS.—Records excellent. Spokane Valley Farms Co.'s canal diverts water three quarters of a mile above gage for irrigation (see records for canal, p. 151). Flow partly regulated by storage and release of water at Coeur d'Alene Lake. Gage-height record furnished by Washington Water Power Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,150	900	900	1,190	1,480	10,600	17,300	26,500	21,300	3,220	965	820
2.....	965	965	900	1,840	1,480	11,700	18,200	27,000	20,400	3,050	965	820
3.....	900	965	900	2,170	1,480	12,000	19,500	27,000	20,000	2,890	965	795
4.....	1,000	845	900	2,170	1,480	11,700	20,400	27,400	19,500	3,310	965	795
5.....	965	795	900	2,170	1,480	11,700	21,300	28,400	18,600	3,310	845	795
6.....	1,000	795	930	2,100	1,480	11,700	21,800	29,400	18,200	3,050	820	795
7.....	930	795	900	2,240	1,480	11,800	21,300	29,900	17,700	2,590	795	795
8.....	900	795	900	2,100	1,720	11,400	20,800	29,900	16,900	2,590	820	795
9.....	1,000	870	900	2,450	2,100	10,900	20,400	30,900	16,000	2,380	845	795
10.....	1,110	900	900	2,590	2,310	10,400	19,500	31,400	15,600	2,170	845	795
11.....	1,110	900	900	2,890	2,240	9,800	19,500	31,800	15,200	1,530	845	795
12.....	1,110	900	900	3,400	2,100	9,220	20,000	31,800	14,800	1,110	845	795
13.....	930	900	900	3,400	1,840	8,680	20,800	32,400	14,400	1,040	820	795
14.....	870	900	900	3,500	1,840	8,120	22,200	32,400	13,600	1,000	820	795
15.....	1,000	900	930	3,500	1,840	7,930	24,600	32,400	13,600	930	795	820
16.....	1,110	900	900	3,400	1,780	7,830	26,000	31,800	13,200	1,070	795	820
17.....	1,110	900	900	3,400	1,780	8,290	27,000	31,400	12,800	1,070	845	820
18.....	1,110	900	900	3,900	1,780	8,590	27,900	29,900	12,000	1,190	870	845
19.....	1,190	870	900	4,320	1,780	9,880	27,900	29,400	11,700	1,420	845	820
20.....	1,370	900	900	4,320	1,780	11,700	28,400	28,400	11,300	1,370	845	900
21.....	1,370	870	900	4,210	2,040	13,200	28,900	27,900	10,600	1,040	845	965
22.....	1,320	870	930	3,690	2,040	13,600	28,900	28,400	10,200	965	820	965
23.....	1,280	870	900	2,520	2,040	14,000	27,900	29,400	7,720	965	820	930
24.....	1,230	900	900	1,980	2,240	14,400	27,000	29,900	6,390	965	870	930
25.....	1,070	870	900	1,650	2,660	14,400	26,000	29,400	5,120	930	845	900
26.....	1,000	870	900	1,480	3,500	14,800	25,500	28,900	4,760	965	820	930
27.....	870	900	900	1,480	4,880	14,800	25,500	27,400	4,100	965	820	930
28.....	820	930	930	1,480	6,910	14,800	26,000	26,500	3,220	965	795	900
29.....	820	900	965	1,530	8,900	15,200	26,000	25,000	2,820	965	820	900
30.....	870	900	965	1,480	-----	16,000	26,500	23,600	3,310	965	820	900
31.....	900	-----	965	1,480	-----	16,400	-----	22,700	-----	965	820	-----

*Discharge of Spokane River and Spokane Valley Farms Co.'s canal at Post Falls, Idaho, 1931-32*

Month	Discharge in second-feet						Combine <sup>d</sup> run-off	
	River, mean	Canal, mean	Combined				Inches	Acre-feet
			Maxi- mum	Mini- mum	Mean	Per square mile		
October.....	1,040		1,370	820	1,040		64,000	
November.....	882		965	795	882		52,500	
December.....	910		965	900	910		56,000	
January.....	2,580		4,320	1,190	2,580		159,000	
February.....	2,430		8,900	1,480	2,430		140,000	
March.....	11,800		16,400	7,830	11,800		726,000	
April.....	23,800	22	28,900	17,300	23,800		1,420,000	
May.....	29,000	173	32,600	22,900	29,200		1,790,000	
June.....	12,500	251	21,600	3,100	12,800		760,000	
July.....	1,640	254	3,580	1,180	1,890		117,000	
August.....	847	241	1,210	1,030	1,090		66,900	
September.....	848	133	1,060	820	981		58,400	
The year.....	7,360	90	32,600	820	7,450	1.92	26.13	5,410,000

NOTE.—Monthly figures showing discharge in second-feet per square mile and run-off in inches are not published, owing to regulation by Coeur d'Alene Lake. The yearly figures represent more nearly the natural discharge and run-off.

## SPOKANE RIVER AT SPOKANE, WASH.

LOCATION.—Water-stage recorder in sec. 13, T. 25 N., R. 42 E., at Cochran Street, Spokane. Zero of gage is about 1,700 feet above mean sea level.

DRAINAGE AREA.—4,350 square miles.

RECORDS AVAILABLE.—April 1891 to September 1932.

EXTREMES.—Maximum discharge during year, 33,500 second-feet Apr. 15 (gage height, 26.75 feet); minimum, 760 second-feet Aug. 26 (gage height, 16.95 feet).

1891-1932: Maximum discharge, 49,000 second-feet May 31, 1894; minimum, 425 second-feet Sept. 20, 1931.

REMARKS.—Records excellent. Discharge estimated Feb. 2-8 and Sept. 18, 19. Water diverted above station for irrigation by Spokane Valley Farms Co. Flow partly regulated by storage and release of water at Coeur d'Alene Lake and by pondage at Spokane. Gage-height record and several discharge measurements furnished by Washington Water Power Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	1,510	1,230	1,320	1,390	1,630	9,810	16,600	26,800	23,200	4,260	1,680	1,430
2-----	1,410	1,240	1,300	1,650		11,100	17,400	26,800	22,700	4,240	1,720	1,460
3-----	1,330	1,350	1,290	2,110		11,600	18,500	27,300	21,700	3,940	1,690	1,450
4-----	1,260	1,270	1,280	2,280		11,700	19,600	27,800	21,200	4,210	1,720	1,390
5-----	1,330	1,190	1,290	2,170	1,900	11,400	20,800	28,300	20,300	4,260	1,660	1,440
6-----	1,320	1,170	1,220	2,140		11,300	21,100	29,300	19,800	4,150	1,510	1,450
7-----	1,320	1,170	1,230	2,190		11,500	21,000	29,800	19,000	3,650	1,500	1,440
8-----	1,250	1,140	1,240	2,220		11,400	20,600	30,300	18,600	3,570	1,500	1,430
9-----	1,220	1,220	1,180	2,260	2,220	10,900	20,100	31,400	17,800	3,440	1,490	1,430
10-----	1,400	1,270	1,210	2,530	2,420	10,400	19,600	31,400	17,400	3,190	1,500	1,470
11-----	1,360	1,260	1,220	2,680	2,370	9,860	19,400	31,900	16,600	3,010	1,560	1,400
12-----	1,400	1,270	1,240	3,210	2,350	9,380	19,700	32,400	16,200	2,280	1,530	1,410
13-----	1,450	1,280	1,210	3,270	2,050	8,830	20,400	32,400	15,800	1,960	1,480	1,410
14-----	1,270	1,270	1,240	3,360	1,980	8,430	21,900	32,900	15,400	2,070	1,500	1,360
15-----	1,320	1,240	1,200	3,340	2,030	8,110	24,200	32,900	15,100	1,980	1,470	1,380
16-----	1,400	1,240	1,210	3,360	2,030	7,970	26,200	32,900	14,700	2,070	1,550	1,420
17-----	1,380	1,240	1,220	3,320	2,030	7,940	27,300	32,400	14,300	2,040	1,480	1,400
18-----	1,420	1,260	1,250	3,620	1,980	8,360	28,300	31,400	14,000	2,030	1,470	1,390
19-----	1,390	1,260	1,200	4,090	1,750	9,470	29,300	30,300	13,200	2,190	1,460	1,370
20-----	1,520	1,250	1,180	4,120	1,760	11,300	29,300	29,800	12,900	2,310	1,490	1,360
21-----	1,610	1,240	1,250	4,090	2,220	12,700	29,800	29,300	12,100	1,970	1,440	1,550
22-----	1,610	1,240	1,220	3,830	2,240	13,500	29,300	29,300	11,800	1,860	1,450	1,550
23-----	1,570	1,240	1,220	3,270	2,200	13,800	28,800	30,300	9,830	1,770	1,430	1,540
24-----	1,520	1,240	1,220	2,290	2,340	13,900	27,800	30,900	7,720	1,790	1,440	1,490
25-----	1,480	1,220	1,190	2,250	2,640	14,200	26,800	30,900	6,470	1,780	1,500	1,510
26-----	1,310	1,190	1,200	1,940	3,200	14,500	26,200	30,300	5,850	1,790	1,400	1,490
27-----	1,370	1,160	1,170	1,920	4,200	14,500	25,700	29,300	5,510	1,730	1,480	1,470
28-----	1,170	1,210	1,250	1,940	5,770	14,500	25,700	28,300	4,850	1,730	1,460	1,470
29-----	1,210	1,180	1,240	1,870	7,830	14,900	26,200	26,800	4,040	1,720	1,380	1,460
30-----	1,120	1,300	1,280	1,910	-----	15,600	26,200	25,700	4,360	1,700	1,450	1,430
31-----	1,250	-----	1,260	1,770	-----	16,100	-----	24,200	-----	1,760	1,450	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October-----	1,610	1,120	1,370	-----	-----	84,200
November-----	1,350	1,140	1,230	-----	-----	73,200
December-----	1,320	1,170	1,230	-----	-----	75,600
January-----	4,120	1,390	2,660	-----	-----	164,000
February-----	7,830	-----	2,500	-----	-----	144,000
March-----	16,100	7,940	11,600	-----	-----	713,000
April-----	29,800	16,600	23,800	-----	-----	1,420,000
May-----	32,900	24,200	29,800	-----	-----	1,830,000
June-----	23,200	4,040	14,100	-----	-----	839,000
July-----	4,260	1,700	2,600	-----	-----	160,000
August-----	1,720	1,380	1,510	-----	-----	92,800
September-----	1,550	1,360	1,440	-----	-----	85,700
The year-----	32,900	1,120	7,820	1.80	24.50	5,680,000

## SPOKANE RIVER BELOW LITTLE FALLS, NEAR LONG LAKE, WASH.

LOCATION.—Water-stage recorder in NW¼ sec. 19, T. 27 N., R. 39 E., 1½ miles below Little Falls power plant of Washington Water Power Co. and 5 miles below Long Lake. Zero of gage is 1,200 feet above mean sea level.

DRAINAGE AREA.—6,380 square miles.

RECORDS AVAILABLE.—November 1912 to September 1932.

EXTREMES.—Maximum discharge during year, 34,400 second-feet May 16 (gage height, 89.05 feet); minimum, 325 second-feet Oct. 8 (estimated from power load).

1912-32: Maximum discharge, 41,300 second-feet May 18, 1917 (gage height, 90.32 feet); minimum discharge, 169 second-feet Sept. 30, 1931 (result of stream-flow measurement).

REMARKS.—Records excellent. Discharge estimated from plant output Nov. 27-30, Dec. 1-7, 12-14, and Jan. 23-25. Water diverted for irrigation above station. Flow affected considerably by power regulation and by storage in Coeur d'Alene Lake. Gage-height record and several discharge measurements furnished by Washington Water Power Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,680	1,610	1,720	1,750	2,850	14,200	20,700	28,000	25,100	5,080	2,200	2,060
2.....	1,900	1,760	1,840	2,000	3,050	14,700	21,900	28,100	23,600	6,070	2,520	2,080
3.....	2,040	1,600	1,690	2,130	3,120	14,800	22,400	28,700	22,700	5,820	2,590	1,900
4.....	1,200	1,420	1,570	2,670	2,830	14,700	23,900	29,000	23,300	4,750	2,140	1,600
5.....	1,910	2,460	1,790	3,110	2,610	14,100	25,100	29,300	22,400	4,680	2,760	1,670
6.....	1,930	2,090	1,490	2,950	2,290	13,500	25,100	30,600	21,500	5,690	2,340	2,300
7.....	1,880	2,090	1,650	2,720	1,850	15,900	24,800	31,800	20,600	4,480	1,720	2,320
8.....	2,130	1,710	1,710	2,620	2,440	15,700	24,600	31,500	20,400	3,090	2,880	2,160
9.....	2,110	1,830	1,680	2,650	2,570	13,300	23,900	32,200	19,800	4,700	2,520	2,030
10.....	1,690	1,750	1,840	3,040	2,420	12,900	22,400	32,500	18,100	3,730	2,410	2,190
11.....	1,040	1,550	1,810	5,260	2,710	11,700	21,800	33,100	17,800	3,910	2,060	2,160
12.....	1,940	1,730	1,880	7,990	2,630	11,900	22,700	32,800	17,500	3,420	2,100	2,290
13.....	2,140	1,710	1,450	6,590	2,590	10,400	24,200	33,100	17,500	2,720	1,960	2,300
14.....	2,430	1,880	1,730	5,310	2,250	9,830	24,200	33,100	16,700	2,690	1,510	2,290
15.....	2,570	1,500	1,930	5,140	2,780	10,900	26,600	33,100	15,800	3,110	2,320	2,010
16.....	2,530	1,720	1,890	5,020	2,800	13,500	27,500	33,400	16,000	2,420	2,580	2,070
17.....	2,410	2,510	2,520	4,290	2,650	13,000	29,000	33,100	15,300	2,930	2,570	2,150
18.....	1,660	2,220	2,660	4,960	2,790	15,700	29,600	32,200	13,300	2,730	2,490	1,940
19.....	2,430	2,420	2,520	5,560	2,700	18,600	31,500	30,000	13,500	2,890	2,410	2,540
20.....	2,460	1,970	1,060	6,680	3,150	17,300	31,500	30,900	14,000	2,990	2,380	2,590
21.....	2,370	1,880	2,600	5,260	4,770	18,600	31,800	30,300	12,800	3,300	1,780	2,530
22.....	2,050	1,710	3,010	4,240	5,070	18,400	31,800	30,000	10,800	2,140	2,340	2,190
23.....	1,970	1,920	2,880	3,710	2,920	18,500	31,200	30,900	11,500	3,070	2,450	2,140
24.....	1,550	2,000	2,640	3,320	2,970	17,000	30,000	32,500	9,440	2,120	2,220	1,980
25.....	942	1,920	1,670	3,340	7,630	19,500	28,400	32,200	8,500	2,790	2,050	1,600
26.....	1,490	1,410	2,250	3,280	14,100	19,600	27,800	31,500	6,760	2,530	2,210	2,220
27.....	1,710	1,890	1,920	3,230	20,600	18,500	27,800	30,300	6,680	2,560	2,100	2,110
28.....	1,790	1,950	2,400	2,910	18,100	19,000	27,800	29,000	6,100	2,330	1,730	2,410
29.....	1,790	1,290	2,350	2,730	16,800	18,400	27,500	26,900	4,630	2,500	2,280	2,630
30.....	2,060	1,800	2,090	2,520	-----	20,500	29,000	26,900	4,650	2,350	2,140	2,150
31.....	2,140	-----	2,230	2,280	-----	20,800	-----	26,000	-----	2,570	2,100	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	2,570	942	1,930	-----	-----	119,000
November.....	2,510	1,290	1,840	-----	-----	109,000
December.....	3,010	1,060	2,020	-----	-----	124,000
January.....	7,990	1,750	3,850	-----	-----	237,000
February.....	20,600	1,850	4,980	-----	-----	286,000
March.....	20,800	9,830	15,700	-----	-----	965,000
April.....	31,800	20,700	26,500	-----	-----	1,580,000
May.....	33,400	26,000	30,800	-----	-----	1,890,000
June.....	25,100	4,630	15,200	-----	-----	904,000
July.....	6,070	2,120	3,420	-----	-----	210,000
August.....	2,880	1,510	2,250	-----	-----	135,000
September.....	2,630	1,600	2,150	-----	-----	125,000
The year.....	33,400	942	9,220	1.45	19.74	6,690,000



## ST. JOE RIVER AT CALDER, IDAHO

**LOCATION.**—Water-stage recorder in sec. 3, T. 45 N., R. 2 E., 150 feet southwest of Chicago, Milwaukee, St. Paul & Pacific Railway station at Calder. Zero of gage is about 2,100 feet above mean sea level.

**DRAINAGE AREA.**—1,080 square miles.

**RECORDS AVAILABLE.**—July 1920 to September 1932; April 1911 to September 1912 at station  $2\frac{1}{2}$  miles downstream.

**EXTREMES.**—Maximum discharge during year, 17,400 second-feet May 14 (gage height, 87.48 feet); minimum, 242 second-feet Nov. 22 (gage height, 78.70 feet).

1911-12, 1920-32: Maximum discharge, 18,000 second-feet May 16, 1927 (gage height, 87.95 feet); minimum, 96 second-feet Dec. 5, 1928 (gage height, 78.43 feet).

**REMARKS.**—Records good except those estimated, Oct. 12-14, 21, 22, 26, 27, Nov. 2-4, Nov. 23 to Jan. 4, Jan. 25 to Feb. 25, which are fair. No diversions above gage. Operation of splash dam at Marble Creek causes diurnal fluctuation at gage of about 1 foot during log-driving season. Gage-height record and results of four discharge measurements furnished by Washington Water Power Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	281	356				2,770	5,570	10,800	6,476	2,140	757	506
2	278					2,140	6,710	11,200	6,956	2,030	735	493
3	272	• 356	• 364	• 380	• 340	1,660	6,950	11,200	6,716	2,090	712	477
4	278					1,360	5,790	13,400	6,716	2,140	674	489
5	370	366		399		1,360	4,560	15,900	6,476	1,860	664	502
6	460	356		396		1,500	3,670	13,800	6,016	1,700	653	472
7	377	447		388		1,280	3,670	14,500	5,576	1,600	638	428
8	328	780	• 370	377	• 370	1,080	3,760	15,200	5,576	1,560	628	424
9	312	654		392		976	3,590	15,500	5,576	1,460	633	424
10	305	526		407		943	4,560	15,900	5,796	1,410	633	424
11												
12	293	477		494		910	6,470	15,200	5,796	1,360	707	417
13	• 284	431		1,060		878	8,790	15,200	5,796	1,320	733	468
14	• 276	403	• 320	748		910	11,500	16,600	5,796	1,240	659	456
15	• 269	411		607		878	13,400	16,300	5,796	1,240	623	406
16	284	407		521		976	10,500	13,100	5,796	1,200	603	402
17					• 320							
18	266	388		464		976	10,200	11,500	5,266	1,160	593	394
19	275	415		435		1,080	9,070	11,200	4,666	1,080	589	394
20	278	431	• 400	443		1,920	9,650	11,800	4,286	1,080	556	394
21	275	419		503		5,570	8,790	11,500	4,016	1,080	542	402
22	275	399		460		4,660	7,710	12,800	3,766	1,010	533	468
23												
24	• 275	309		427		3,280	6,710	13,800	3,676	943	524	464
25	• 284	258		407	• 370	2,640	5,790	14,500	3,676	910	533	515
26	435	• 250	• 480	352		2,380	5,360	12,100	3,676	910	560	502
27	• 423	• 275		352		2,380	5,570	10,500	3,430	878	538	391
28	388	• 330		• 340	• 500	2,580	6,950	9,070	3,126	847	502	406
29												
30	• 380			• 350	2,640	2,260	9,360	7,710	2,916	847	489	398
31	• 390			• 350	6,240	2,030	10,200	6,950	2,706	816	477	394
32	472	• 320	• 400	• 352	5,570	2,980	10,500	6,470	2,586	792	485	387
33	477			• 340	3,920	3,920	9,070	6,470	2,456	781	477	380
34	415			• 330		3,350	9,650	6,470	2,206	769	560	376
35	370			• 340		3,590		6,240		763	551	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	477	264	333	0.308	0.36	20,500
November	760	250	391	.362	.40	23,300
December			389	.360	.42	23,900
January	1,060	330	437	.405	.47	26,900
February	6,240		934	.865	.93	53,700
March	5,570	878	2,100	1.94	2.24	129,000
April	13,400	3,590	7,470	6.92	7.72	444,000
May	16,600	6,240	12,000	11.1	12.80	738,000
June	6,950	2,200	4,770	4.42	4.93	284,000
July	2,140	763	1,260	1.17	1.35	77,500
August	757	477	598	.554	.64	36,800
September	515	376	435	.403	.45	25,900
The year	16,600	250	2,600	2.41	32.71	1,880,000

• Estimated.

## ST. MARIES RIVER AT LOTUS, IDAHO

LOCATION.—Staff gage in sec. 20, T. 45 N., R. 2 W., just below Lotus. Zero of gage is approximately 2,160 feet above mean sea level.

DRAINAGE AREA.—420 square miles.

RECORDS AVAILABLE.—July 1911 to October 1912; July 1920 to September 1932.

EXTREMES.—Maximum discharge during year, 5,060 second-feet Mar. 19 (gage height, 6.88 feet); minimum (estimated), 30 second-feet Dec. 11–15.

1911–12, 1920–32: Maximum discharge, 8,660 second-feet Mar. 18, 1921; minimum (estimated), 16 second-feet Nov. 21, 1929; minimum gage height, 2.71 feet Nov. 20, 1929.

REMARKS.—Records good except those estimated, Nov. 23 to Feb. 28, Mar. 6–9, 19, 25, 26, 29, which are fair. No diversions above gage. Gage-height record and results of four discharge measurements furnished by Washington Water Power Co.

*Discharge, in second-feet, 1931–32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.*	May	June	July	Aug.	Sept.	
1	34	64	40	65	75	2,430	3,570	2,430	930	178	70	51	
2	35	60	42			1,760	3,780	2,600	880	178	66	50	
3	35	58	43			1,190	3,780	2,600	835	174	66	48	
4	34	52	44			835	3,570	2,970	790	218	64	48	
5	70	51	45			657	2,780	4,200	745	208	60	45	
6	62	50	45	80	700	2,270	3,170	700	182	58	44	44	
7	66	58				2,120	2,600	657	199	56	44	44	
8	58	94				1,970	2,600	614	169	58	44	44	
9	45	161				1,760	2,430	614	136	56	42	42	
10	44	140				614	1,970	2,430	573	129	56	42	
11	42	102	30	180	40	614	2,430	2,430	573	123	60	42	
12	42	82				370	2,970	2,270	532	117	68	42	
13	40	76				370	3,570	2,120	573	111	68	42	
14	40	76				405	3,990	2,120	532	117	64	42	
15	38	74				517	4,410	1,970	532	117	62	42	
16	38	76	60	140	60	745	3,370	1,690	532	108	58	42	
17	37	82				880	3,170	1,370	501	105	54	42	
18	40	86				1,080	3,370	1,310	426	102	50	40	
19	42	92				3,500	3,570	1,370	397	99	50	40	
20	42	64				2,120	3,370	1,430	363	96	64	48	
21	42	50	75	125	100	1,140	2,780	1,620	337	94	46	46	
22	45	37				1,830	2,270	3,990	317	89	48	48	
23	68	38				2,120	1,970	2,780	300	89	50	48	
24	108					1,970	1,830	2,430	288	82	50	48	
25	82					2,200	1,830	1,830	271	79	48	48	
26	82	35	70	100	600	1,800	2,120	1,430	249	79	46	46	
27	108					3,200	2,430	1,250	234	76	45	46	
28	86					3,000	2,270	2,430	1,190	218	76	45	45
29	140					2,780	3,500	2,430	1,080	213	74	45	44
30	108					3,170	2,430	1,030	195	72	45	44	
31	84					2,430	930	72	46				

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	140	34	59.3	0.141	0.16	3,650
November.....	161		65.8	.157	.18	3,920
December.....			54.3	.129	.15	3,340
January.....			115	.274	.32	7,070
February.....	3,200		382	.910	.98	22,000
March.....	3,500	370	1,450	3.45	3.98	89,200
April.....	4,410	1,760	2,810	6.69	7.46	167,000
May.....	4,200	930	2,120	5.05	5.82	130,000
June.....	930	195	497	1.18	1.32	29,600
July.....	218	72	121	.288	.33	7,440
August.....	70	45	55.5	.132	.15	3,410
September.....	51	40	44.8	.107	.12	2,670
The year.....	4,410		647	1.54	20.97	469,000

## HAYDEN LAKE AT HAYDEN LAKE, IDAHO

LOCATION.—Staff gage in sec. 18, T. 51 N., R. 3 W., at Avondale and Hayden Lake pumping plants, a quarter of a mile north of Bozanta Tavern. Zero of gage is 2,200.00 feet above mean sea level, United States Coast and Geodetic Survey datum.

RECORDS AVAILABLE.—May 1920 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 2,231.38 feet May 26-28; minimum, 2,219.38 feet Dec. 16.

1920-32: Maximum water-surface elevation, 2,240.41 feet Apr. 30 to May 18, 1921; minimum, that of Dec. 16, 1931.

REMARKS.—Records good. No records Oct. 22, Dec. 7, Jan. 10, 11, Aug. 29. Water is pumped from lake for irrigation and domestic purposes.

*Gage height, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19.94	19.53	19.51	19.80	20.06	21.70	25.26	29.96	31.30	29.54	27.32	25.44
2	19.92	19.52	19.48	19.80	20.06	21.88	25.56	30.06	31.30	29.44	27.26	25.38
3	19.90	19.50	19.47	19.80	20.06	21.98	25.88	30.17	31.30	29.36	27.18	25.32
4	19.88	19.48	19.47	19.80	20.06	22.04	26.20	30.26	31.30	29.33	27.12	25.28
5	19.86	19.46	19.47	19.79	20.06	22.08	26.50	30.34	31.23	29.30	27.06	25.24
6	19.85	19.45	19.47	19.79	20.06	22.24	26.68	30.40	31.22	29.23	27.00	25.20
7	19.84	19.45	19.47	19.79	20.06	22.30	26.76	30.44	31.20	29.16	26.96	25.16
8	19.82	19.45	19.47	19.78	20.06	22.34	26.86	30.48	31.18	29.08	26.88	25.11
9	19.79	19.48	19.46	19.84	20.08	22.34	26.92	30.54	31.18	29.00	26.82	25.06
10	19.76	19.56	19.46	19.80	20.10	22.34	27.00	30.58	31.14	28.93	26.76	24.97
11	19.74	19.56	19.46	19.88	20.12	22.34	27.10	30.60	31.10	28.86	26.70	24.93
12	19.72	19.56	19.46	19.88	20.12	22.34	27.23	30.62	31.04	28.76	26.62	24.89
13	19.71	19.56	19.44	19.90	20.12	22.36	27.44	30.64	31.00	28.68	26.54	24.85
14	19.70	19.56	19.42	19.92	20.12	22.40	27.64	30.64	30.94	28.60	26.50	24.79
15	19.69	19.58	19.40	19.94	20.12	22.48	28.12	30.64	30.83	28.52	26.46	24.73
16	19.67	19.60	19.38	19.96	20.12	22.52	28.36	30.62	30.80	28.44	26.38	24.69
17	19.66	19.61	19.40	19.96	20.12	22.58	28.54	30.60	30.74	28.38	26.34	24.65
18	19.65	19.64	19.42	19.98	20.12	22.70	28.78	30.56	30.63	28.32	26.28	24.61
19	19.64	19.66	19.52	20.00	20.12	22.94	28.90	30.54	30.60	28.26	26.24	24.59
20	19.62	19.68	19.58	20.04	20.12	23.30	29.06	30.56	30.54	28.18	26.20	24.57
21	19.60	19.70	19.60	20.06	20.12	23.56	29.20	30.58	30.43	28.10	26.12	24.54
22	19.66	19.64	20.06	20.12	23.74	29.30	30.66	30.33	28.04	26.04	24.51	24.51
23	19.60	19.62	20.06	20.10	23.90	29.42	31.00	30.23	27.96	26.00	24.49	24.49
24	19.58	19.60	20.05	20.10	24.04	29.44	31.22	30.20	27.90	25.96	24.47	24.47
25	19.58	19.60	20.04	20.10	24.20	29.50	31.34	30.12	27.82	25.90	24.45	24.45
26	19.58	19.58	20.04	20.18	24.32	29.56	31.38	30.04	27.76	25.84	24.43	24.43
27	19.58	19.56	20.06	20.62	24.44	29.66	31.38	29.94	27.68	25.78	24.43	24.43
28	19.60	19.55	20.06	21.12	24.60	29.76	31.38	29.83	27.62	25.72	24.41	24.41
29	19.58	19.54	20.06	21.62	24.76	29.86	31.36	29.73	27.56	25.68	24.40	24.40
30	19.56	19.52	20.06	20.06	24.96	29.92	31.34	29.64	27.48	25.56	24.37	24.37
31	19.54	19.78	20.06	20.06	25.10	29.92	31.32	29.48	27.40	25.50	24.35	24.35

## SPOKANE VALLEY FARMS CO.'S CANAL AT POST FALLS, IDAHO

LOCATION.—Staff gage in NE¼ sec. 4, T. 50 N., R. 5 W., 1,200 feet below head gates and half a mile west of Post Falls.

RECORDS AVAILABLE.—May 1911 to September 1917; September 1919 to September 1932.

EXTREMES.—Maximum discharge during year, 284 second-feet June 14-16; maximum gage height, 5.00 feet Aug. 3; no flow during nonirrigation season. 1911-17, 1919-32: Maximum discharge, 286 second-feet July 18, 1927; maximum gage height, 5.00 feet Aug. 3, 1932; no flow during nonirrigation season.

REMARKS.—Records fair. Canal diverts water for irrigation from Spokane River in SE¼ sec. 3, T. 50 N., R. 5 W. Gage-height record furnished by Spokane Valley Farms Co.

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

Day	Apr.	May	June	July	Aug.	Sept.
1.....	0	85	221	266	239	239
2.....	0	85	212	266	239	239
3.....	0	85	212	266	248	239
4.....	0	85	212	266	248	239
5.....	0	85	212	266	248	239
6.....	0	85	212	266	248	230
7.....	0	85	212	266	248	230
8.....	0	85	212	266	248	230
9.....	0	85	203	266	248	230
10.....	0	91	230	257	239	230
11.....	0	97	230	257	239	230
12.....	0	145	248	257	239	230
13.....	0	203	266	257	239	221
14.....	0	221	284	257	239	221
15.....	0	221	284	257	239	221
16.....	0	221	284	248	239	221
17.....	2	239	275	257	239	221
18.....	42	248	275	257	239	74
19.....	42	248	266	257	239	0
20.....	42	239	266	257	239	0
21.....	42	230	266	248	239	0
22.....	42	230	266	248	239	0
23.....	42	194	266	248	239	0
24.....	42	221	275	248	239	0
25.....	42	221	275	248	239	0
26.....	42	212	275	239	239	0
27.....	53	212	275	239	239	0
28.....	73	230	266	239	239	0
29.....	85	230	275	239	239	0
30.....	85	221	266	239	239	0
31.....		221		239	239	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 17-30.....	85	2	48.3	1,340
May.....	248	85	173	10,600
June.....	284	203	251	14,900
July.....	266	239	254	15,600
August.....	248	239	241	14,800
September 1-18.....	239	74	221	7,890
The year.....	284	2	212	65,100

NOTE.—No flow during months omitted.

## LITTLE SPOKANE RIVER AT DARTFORD, WASH.

LOCATION.—Staff gage in sec. 6, T. 26 N., R. 43 E., 50 feet below highway bridge at Dartford and 6 miles above mouth.

DRAINAGE AREA.—600 square miles.

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

EXTREMES.—Maximum discharge during year, 1,670 second-feet Feb. 27 (gage height, 4.30 feet); minimum, 80 second-feet Oct. 1 (gage height, 1.21 feet). 1929-32: Maximum discharge, that of Feb. 27, 1932; minimum, 63 second-feet July 24, 1930 (gage height, 1.07 feet).

REMARKS.—Records fair. Discharge estimated Dec. 25, Feb. 1-7 (because of ice), and Sept. 6-8. No diversions of any consequence above station.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	80	96	118	162	140	1,130	1,320	895	402	130	114	117
2.....	81	96	120	152		1,010	1,320	895	402	130	112	117
3.....	81	94	126	152		840	1,390	840	402	146	114	112
4.....	81	96	118	152		585	1,390	785	380	140	112	108
5.....	84	94	118	152		595	1,390	790	390	138	112	104
6.....	86	94	118	142	140	545	1,320	702	358	135	112	104
7.....	87	97	120	142		470	1,190	675	335	133	112	104
8.....	87	102	122	142		402	1,130	620	315	130	110	104
9.....	87	108	124	152		380	1,070	620	295	128	112	104
10.....	86	117	122	162		402	1,010	570	295	126	114	108
11.....	86	120	120	595	171	358	1,010	570	258	126	117	106
12.....	87	115	118	295	174	358	1,010	545	258	126	114	104
13.....	87	117	118	242	168	358	1,010	520	242	128	112	104
14.....	86	132	96	190	181	380	1,070	520	225	126	112	104
15.....	84	142	126	193	174	470	1,070	470	242	126	112	104
16.....	84	138	118	190	171	595	1,070	448	242	128	110	106
17.....	86	134	130	199	171	1,070	1,070	448	225	126	108	104
18.....	87	132	206	203	168	1,250	1,070	425	225	126	108	104
19.....	86	134	172	295	162	1,390	1,130	448	225	124	108	104
20.....	87	132	162	315	154	1,390	1,390	448	219	121	108	112
21.....	86	126	245	258	154	1,250	1,190	470	212	119	108	110
22.....	90	111	194	225	184	1,190	1,130	620	209	117	112	110
23.....	90	136	183	199	171	1,190	1,070	840	203	117	108	110
24.....	92	130	218	187	335	1,190	1,070	702	196	112	106	108
25.....	94	126	185	199	315	1,530	1,070	620	193	108	106	117
26.....	94	126	152	209	1,460	1,250	1,010	545	174	112	106	112
27.....	96	122	194	199	1,670	1,130	950	520	168	112	104	112
28.....	97	118	194	184	1,390	1,190	950	470	162	112	104	112
29.....	96	117	172	174	1,190	1,460	950	448	154	112	108	110
30.....	96	118	162	178	-----	1,320	950	425	146	114	124	108
31.....	94	-----	152	140	-----	1,320	-----	425	-----	114	121	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October.....	97	80	87.9	0.146	0.17	5,400
November.....	142	94	117	.195	.22	6,960
December.....	245	96	149	.248	.29	9,160
January.....	595	140	206	.343	.40	12,700
February.....	1,670	-----	347	.578	.62	20,000
March.....	1,530	358	903	1.50	1.73	55,500
April.....	1,390	950	1,130	1.88	2.10	67,200
May.....	895	425	589	.982	1.13	36,200
June.....	402	146	258	.430	.48	15,400
July.....	146	108	124	.207	.24	7,620
August.....	124	104	111	.185	.21	6,820
September.....	117	104	108	.180	.20	6,430
The year.....	1,670	80	343	.572	7.79	249,000

## OKANOGAN RIVER BASIN

## OKANOGAN RIVER AT OKANOGAN FALLS, BRITISH COLUMBIA

(International gaging station)

LOCATION.—Staff gage between highway bridge and crest of falls at Okanogan Falls, British Columbia.

DRAINAGE AREA.—2,550 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932; March 1915 to September 1930 in Canadian water-resources papers.

EXTREMES.—Maximum discharge during year, 970 second-feet May 7 (gage height, 2.60 feet); minimum, 7.7 second-feet Jan. 9, 10 (gage height, -0.82 foot).

1915-32: Maximum discharge, 2,680 second-feet June 10, 1928; minimum, 4.6 second-feet Mar. 14, 1931.

REMARKS.—Flow regulated by control dam at outlet of Okanogan Lake. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	58.0	88.0	9.4	9.6	201	596	655	869	839	788	474	465
2.....	64.0	104	9.9	9.1	165	606	660	863	845	793	476	465
3.....	55.0	109	11.5	9.1	129	596	686	875	851	766	476	469
4.....	41.0	114	11.1	9.1	142	606	666	904	867	782	573	456
5.....	52.0	88.0	9.1	9.4	201	660	635	910	851	793	474	456
6.....	41.0	116	10.5	10.2	171	655	630	934	845	766	474	494
7.....	41.0	106	11.1	11.1	171	640	630	970	845	750	474	444
8.....	35.4	109	10.8	9.6	226	640	610	952	845	744	479	469
9.....	35.4	99.0	10.8	7.7	239	630	586	896	851	728	452	460
10.....	48.0	102	10.5	7.7	320	635	581	940	851	793	479	429
11.....	41.0	84.0	10.5	35.3	320	610	567	910	857	712	475	456
12.....	39.6	65.0	10.5	15.5	327	610	572	934	851	686	473	444
13.....	36.8	72.0	9.6	21.5	353	615	591	940	863	650	477	473
14.....	38.2	67.0	9.1	11.1	368	620	620	886	869	660	474	465
15.....	35.4	65.0	8.8	12.9	356	610	650	851	851	625	470	460
16.....	35.4	72.0	8.8	12.0	383	615	625	839	869	601	474	452
17.....	35.4	69.0	10.2	13.3	394	640	655	845	845	591	477	429
18.....	35.4	64.0	8.2	13.3	417	610	660	828	845	552	471	448
19.....	27.0	64.0	8.5	15.1	417	655	630	851	851	538	479	440
20.....	38.2	64.0	11.1	16.1	413	660	697	863	828	543	473	452
21.....	12.9	52.0	9.6	12.9	425	671	718	898	851	529	471	452
22.....	36.8	55.0	8.2	27.8	444	666	723	892	940	534	473	460
23.....	35.4	45.2	10.5	22.9	444	645	728	857	857	538	470	473
24.....	42.4	34.0	8.8	28.5	503	640	739	869	851	516	471	477
25.....	52.0	38.2	9.4	44.6	494	676	750	880	828	503	470	477
26.....	67.0	34.0	8.5	63.0	538	676	766	857	819	503	476	486
27.....	57.0	34.0	10.2	88.0	610	676	788	857	810	481	473	465
28.....	62.0	11.5	10.2	116	596	686	816	851	805	432	477	452
29.....	62.0	9.9	9.4	142	596	676	845	845	822	486	473	444
30.....	64.0	11.1	9.1	186	-----	635	845	839	793	486	476	432
31.....	94.0	-----	9.4	201	-----	666	-----	851	-----	486	444	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	94.0	12.9	47.7	2,930
November.....	116	9.9	68.0	4,050
December.....	11.5	8.2	9.8	603
January.....	201	7.7	38.4	2,360
February.....	610	129	357	20,500
March.....	686	596	639	39,300
April.....	845	567	677	40,300
May.....	970	828	883	54,300
June.....	940	793	846	50,300
July.....	793	432	624	38,400
August.....	503	444	479	29,500
September.....	494	429	458	27,300
The year.....	970	7.7	427	310,000

## OSOYOOS LAKE NEAR OROVILLE, WASH.

(International gaging station)

**LOCATION.**—Water-stage recorder in lot 1, sec. 8, T. 40 N., R. 27 E., 1 mile south of Canadian boundary and 3 miles north of Oroville. Gage datum is at mean sea level.

**DRAINAGE AREA.**—3,250 square miles.

**RECORDS AVAILABLE.**—July 1928 to September 1932.

**EXTREMES.**—Maximum stage recorded during year, 915.46 feet May 13; minimum, 911.63 feet Oct. 12.

1928-32: Maximum stage recorded, 916.01 feet July 28, 1928; minimum, 911.21 feet Oct. 14, 1929.

**REMARKS.**—Records excellent. No records Dec. 1-7, 9-18. Stage probably affected by ice at lake outlet during some part of period January to March. Diversion in Canada for irrigation. Okanogan River subject to natural regulation in several lakes, and, in the interest of navigation, to artificial regulation in Okanogan Lake. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

*Gage height, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	11.69	11.86	-----	11.82	11.85	13.33	14.16	14.93	14.74	14.08	13.20	12.97
2.....	11.70	11.86	-----	11.82	11.84	13.44	14.17	14.99	14.72	14.04	13.18	12.95
3.....	11.70	11.84	-----	11.80	11.85	13.49	14.15	15.05	14.70	14.02	13.17	12.95
4.....	11.67	11.84	-----	11.80	11.85	13.57	14.16	15.11	14.69	14.01	13.15	12.95
5.....	11.69	11.82	-----	11.79	11.90	13.67	14.17	15.15	14.66	13.99	13.13	12.97
6.....	11.69	11.80	-----	11.78	11.99	13.74	14.14	15.17	14.63	13.94	13.11	12.98
7.....	11.67	11.79	-----	11.78	12.08	13.80	14.14	15.24	14.61	13.92	13.09	12.98
8.....	11.66	11.77	11.72	12.78	12.14	13.87	14.13	15.29	14.58	13.90	13.08	12.98
9.....	11.65	11.78	-----	11.79	12.18	13.91	14.12	15.33	14.54	13.88	13.05	12.98
10.....	11.64	11.79	-----	11.79	12.22	13.94	14.10	15.39	14.52	13.84	13.03	12.98
11.....	11.65	11.76	-----	11.80	12.25	13.96	14.08	15.41	14.51	13.84	13.02	12.98
12.....	11.64	11.74	-----	11.81	12.29	13.99	14.08	15.43	14.51	13.83	13.03	12.98
13.....	11.64	11.75	-----	11.80	12.36	14.00	14.06	15.44	14.49	13.83	13.02	12.98
14.....	11.65	11.79	-----	11.78	12.42	14.03	14.07	15.41	14.49	13.81	13.02	12.98
15.....	11.65	11.79	-----	11.79	12.50	14.04	14.09	15.35	14.49	13.80	13.00	12.96
16.....	11.66	11.80	-----	11.81	12.57	14.05	14.14	15.32	14.46	13.78	13.00	12.95
17.....	11.67	11.80	-----	11.81	12.61	14.06	14.18	15.26	14.40	13.76	12.99	12.95
18.....	11.69	11.79	-----	11.83	12.66	14.07	14.22	15.21	14.38	13.73	12.99	12.94
19.....	11.70	11.79	11.72	11.84	12.69	14.07	14.29	15.15	14.35	13.70	12.99	12.93
20.....	11.71	11.80	11.73	11.85	12.73	14.06	14.35	15.11	14.32	13.66	12.99	12.94
21.....	11.70	11.75	11.76	11.85	12.78	14.05	14.38	15.10	14.32	13.62	13.00	12.94
22.....	11.76	11.75	11.76	11.85	12.81	14.06	14.39	15.10	14.30	13.56	12.99	12.96
23.....	11.75	11.74	11.77	11.85	12.85	14.08	14.45	15.09	14.28	13.56	13.00	12.99
24.....	11.75	11.74	11.77	11.85	12.88	14.10	14.49	15.06	14.25	13.50	13.00	13.02
25.....	11.79	11.76	11.77	11.85	12.92	14.11	14.54	15.01	14.22	13.46	13.02	13.03
26.....	11.81	11.76	11.77	11.85	12.99	14.12	14.57	14.98	14.18	13.42	13.02	13.05
27.....	11.83	11.74	11.80	11.85	13.08	14.13	14.63	14.93	14.17	13.37	13.02	13.08
28.....	11.85	11.74	11.80	11.85	13.17	14.16	14.71	14.89	14.15	13.31	13.02	13.09
29.....	11.86	11.73	11.80	11.85	13.26	14.16	14.76	14.83	14.12	13.29	12.98	13.09
30.....	11.86	11.73	11.79	11.84	-----	14.16	14.85	14.80	14.09	13.26	12.98	13.10
31.....	11.86	-----	11.81	11.84	-----	14.16	-----	14.78	-----	13.22	12.97	-----

NOTE.—Add 900 feet to obtain elevation above mean sea level.

## OKANOGAN RIVER NEAR TONASKET, WASH.

(International gaging station)

LOCATION.—Water-stage recorder in lot 3, sec. 8, T. 36 N., R. 27 E., 1,000 feet above Chewiliken Creek and 5½ miles south of Tonasket.

DRAINAGE AREA.—7,250 square miles.

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 10,600 second-feet May 12, 14, 15 (gage height, 11.5 feet); minimum occurred during period of ice effect.

1929-32: Maximum discharge, that of May 12, 14, 15, 1932; minimum, 126 second-feet Sept. 5, 1931 (gage height, 3.43 feet).

REMARKS.—Records excellent except those for extremely low flow and those estimated because of ice, Jan. 13 to Feb. 21, which are poor. Numerous irrigation diversions above station. Flow subject to natural regulation in several lakes, and, in the interest of navigation, to artificial regulation in Okanogan Lake. Operation of power plant with pondage on Similkameen River affects low-water flow slightly. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	397	496	452	474	340	4,620	1,720	5,940	6,960	3,910	1,270	741
2	414	496	397	480		3,440	1,760	6,280	7,130	3,670	1,290	769
3	402	496	364	474		2,860	1,950	6,790	7,130	3,510	1,150	748
4	402	630	446	463		2,450	2,000	7,130	7,130	3,290	1,150	748
5	408	734	518	463		2,250	2,000	7,470	7,300	3,210	1,110	769
6	397	727	534	463	340	2,200	2,000	8,150	7,130	3,070	1,070	762
7	392	690	518	441		2,200	1,950	8,680	6,790	2,960	1,070	734
8	408	684	546	446		2,150	1,950	9,340	6,620	2,620	1,000	720
9	458	874	582	463		2,050	1,900	9,520	6,620	2,500	1,000	714
10	419	916	524	452		1,950	1,900	9,660	6,960	2,400	905	690
11	424	832	552	468	380	1,900	1,900	10,200	7,470	2,350	905	702
12	402	776	542	480		1,900	1,950	10,600	7,980	2,560	900	714
13	402	755	430			1,800	2,050	10,400	8,660	2,450	900	696
14	392	734	392			1,760	2,350	10,600	9,170	2,300	903	684
15	364	755	359			1,800	3,000	10,600	9,170	2,250	902	660
16	359	797	348	380	530	1,800	3,670	10,100	9,170	2,150	805	666
17	397	769	424			1,800	3,750	9,340	8,490	2,150	800	654
18	408	727	436			1,760	3,750	9,000	7,640	2,050	805	664
19	397	672	512			1,760	3,670	8,830	6,960	2,000	805	636
20	375	654	576			1,760	3,590	8,830	6,450	1,950	804	636
21	364	648	564	330	696	1,850	3,510	9,170	6,280	1,850	776	642
22	402	648	552			1,850	3,360	9,520	6,450	1,800	703	636
23	386	576	552			1,800	3,360	9,340	6,620	1,760	703	654
24	397	507	558			1,800	3,360	9,170	6,110	1,670	703	678
25	402	480	540			1,800	3,360	8,660	5,800	1,620	700	696
26	386	570	518	330	1,110	1,760	3,360	8,150	5,270	1,580	804	684
27	430	581	534			1,400	1,760	3,750	7,640	1,540	700	666
28	380	700	534			3,960	1,720	4,310	7,300	1,440	700	708
29	414	490	512			6,620	1,720	4,950	6,960	1,400	700	708
30	452	463	468			1,720	5,430	6,790	4,150	1,310	705	708
31	468		452			1,720		6,960		1,310	705	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	468	359	408	24,800
November	916	483	663	39,500
December	582	348	491	30,200
January	480		398	24,500
February	6,620		883	50,800
March	4,620	1,720	2,060	127,000
April	5,430	1,720	2,920	174,000
May	10,600	5,940	8,620	530,000
June	9,170	4,150	6,840	407,000
July	3,910	1,310	2,270	140,000
August	1,270	755	915	56,300
September	769	636	696	41,400
The year	10,600		2,260	1,650,000



## SIMILKAMEEN RIVER NEAR NIGHTHAWK, WASH.

(International gaging station)

LOCATION.—Water-stage recorder in NW¼ sec. 7, T. 40 N., R. 26 E., about 1¼ miles below Nighthawk, Wash.

DRAINAGE AREA.—3,420 square miles.

RECORDS AVAILABLE.—September 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 10,200 second-feet May 11, 14 (gage height, 10.0 feet); minimum occurred during period of ice effect.

1928-32: Maximum discharge, that of May 11, 14, 1932; minimum, 120 second-feet Jan. 6, 1930 (gage height, 2.05 feet).

High-water marks indicate a stage of about 13.0 feet in May 1928.

REMARKS.—Records excellent except those estimated for December 1-24 and for period of ice effect, January 27 to February 24, which are poor. Some regulation caused by natural diversion into Palmer Lake. Small irrigation diversions above station. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	415	385	380	370	250	3,390	996	5,690	6,230	2,990	834	456
2	419	406		374		2,540	1,220	6,050	6,420	2,790	808	447
3	424	539		370		2,160	1,300	6,420	6,420	2,600	782	442
4	415	656		370		1,780	1,300	6,800	6,420	2,420	749	456
5	406	602	410	366	350	1,680	1,300	7,390	6,420	2,420	723	428
6	398	572		363		1,680	1,260	8,190	6,050	2,210	698	415
7	437	566		363		1,640	1,260	8,590	5,690	2,060	680	402
8	456	746		366		1,550	1,220	9,190	5,870	1,910	656	381
9	442	788	350	366	350	1,420	1,220	9,190	6,050	1,820	626	374
10	419	704		366		1,380	1,220	9,600	6,610	1,780	596	381
11	411	656		381		1,340	1,220	10,200	7,190	1,860	590	398
12	398	614		385		1,260	1,340	9,810	7,790	1,960	596	385
13	389	584	350	352	350	1,180	1,640	10,000	8,390	1,780	590	374
14	385	620		282		1,180	2,140	10,200	8,790	1,680	578	363
15	385	662		309		1,180	3,060	9,390	8,790	1,640	554	352
16	381	620		325		1,140	3,130	8,590	8,390	1,600	536	345
17	381	560	410	352	389	1,100	3,060	8,190	7,390	1,550	514	335
18	378	519		363		1,060	2,920	8,190	6,610	1,460	492	338
19	374	524		381		1,060	2,790	8,190	6,050	1,390	475	335
20	363	514		389		1,180	2,720	8,590	5,690	1,380	475	328
21	359	480	402	378	389	1,180	2,600	8,990	5,690	1,300	470	328
22	381	437		345		1,140	2,540	8,790	5,870	1,260	461	338
23	385	389		335		1,100	2,540	8,390	5,690	1,220	480	352
24	374	428		338		1,100	2,540	7,790	5,150	1,180	475	352
25	381	475	363	328	398	1,060	2,480	7,390	4,630	1,140	480	348
26	381	466		303		1,040	2,720	6,800	4,290	1,100	466	348
27	381	398		411		1,590	3,350	6,230	3,890	1,040	447	363
28	378	352		394		7,790	996	5,870	3,650	988	442	355
29	378	348	290	378	980	5,060	980	4,630	5,870	3,420	931	456
30	378	350		338		980	5,150	6,050	3,280	910	447	341
31	385			363		973		6,050		875	447	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	456	359	395	24,300
November	788	348	532	31,700
December			387	23,800
January	389		344	21,200
February	7,790		774	44,500
March	3,390	973	1,370	84,200
April	5,150	996	2,220	136,000
May	10,200	5,690	7,960	489,000
June	8,790	3,280	6,090	362,000
July	2,990	875	1,650	101,000
August	834	442	568	34,900
September	456	328	374	22,300
The year	10,200		1,900	1,370,000

## CHELAN RIVER BASIN

## STEHEKIN RIVER AT STEHEKIN, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 26, T. 33 N., R. 17 E., 1,200 feet above Boulder Creek and 2 miles above Lake Chelan and Stehekin. Flow of Boulder Creek included in records of discharge.

DRAINAGE AREA.—372 square miles.

RECORDS AVAILABLE.—December 1910 to October 1915 and January 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 10,200 second-feet Feb. 27 (gage height, 26.11 feet); minimum, 167 second-feet Feb. 17 (gage height, 18.98 feet).

1910-15, 1927-32: Maximum discharge, 11,400 second-feet June 12, 1911, and May 22, 1928; minimum, 56 second-feet Jan. 12, 1930 (gage height, 18.59 feet).

REMARKS.—Records good. Discharge estimated Dec. 31 to Jan. 3, Aug. 22-29. At very high stages small percentage of flow is diverted above gage by natural sloughs; amount diverted included in records of discharge. Gage-height record and several discharge measurements furnished by Chelan Electric Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	461	564	309	201	209	2,910	1,260	3,590	2,980	3,590	1,280	661
2	425	840	309	196	206	2,370	1,420	3,510	3,200	3,280	1,260	563
3	374	584	302	192	216	1,950	1,310	3,430	3,350	3,670	1,420	515
4	375	506	294	188	223	1,710	1,280	3,670	3,510	3,430	1,530	524
5	510	470	287	195	226	1,480	1,180	4,070	2,980	2,630	1,530	594
6	425	621	287	195	230	1,280	1,110	4,150	2,700	2,250	1,420	679
7	388	860	291	192	226	1,100	1,080	4,470	2,840	2,190	1,480	709
8	363	644	280	192	220	1,010	1,050	4,310	3,280	2,190	1,420	715
9	352	589	276	195	220	930	1,030	4,310	4,150	2,130	1,190	558
10	338	539	273	184	216	874	1,040	4,800	4,970	2,770	994	534
11	323	496	262	476	220	818	1,156	4,470	5,720	2,310	930	520
12	316	463	237	449	209	784	1,480	4,470	6,540	1,890	853	465
13	309	579	251	359	206	752	2,010	4,500	7,170	2,010	797	461
14	298	524	251	374	198	727	2,770	4,470	7,170	2,010	818	553
15	294	488	240	356	202	703	2,700	3,830	6,960	2,010	930	515
16	291	465	237	348	184	679	2,500	3,430	5,340	2,010	1,240	506
17	284	461	212	341	181	715	2,250	3,430	4,310	2,070	1,360	488
18	276	433	248	334	192	874	2,070	3,670	3,830	1,830	1,240	429
19	266	425	255	334	181	1,030	2,010	3,990	3,590	1,590	1,050	418
20	262	406	248	316	181	978	1,830	4,470	4,150	1,650	946	403
21	255	356	248	312	181	930	1,650	3,990	5,720	2,010	902	370
22	258	366	240	294	178	916	1,590	3,670	5,340	2,250		348
23	266	366	240	287	178	881	1,590	3,200	4,800	2,250		334
24	258	352	240	291	217	916	1,530	2,840	4,150	2,190		410
25	273	349	230	280	373	930	1,650	2,500	3,830	2,070		395
26	273	345	226	273	3,380	888	2,070	2,250	3,510	1,770	750	359
27	280	316	223	269	9,120	853	2,440	2,070	3,670	1,710		374
28	309	305	212	266	6,460	881	2,910	2,070	3,910	1,950		392
29	345	323	206	255	3,990	881	3,120	2,250	4,070	1,650		399
30	327	316	209	248		888	3,350	2,370	3,670	1,310	679	399
31	370		205	234		994		2,700		1,290	605	

Month	Maximum	Minimum	Mean	Per square mile	Run off	
					Inches	Acre-feet
October	510	255	327	0.879	1.01	20,100
November	860	305	479	1.29	1.44	28,500
December	309	205	253	.680	.78	15,600
January	476	184	278	.747	.86	17,100
February	9,120	178	973	2.62	2.83	56,000
March	2,910	679	1,080	2.90	3.34	66,400
April	3,350	1,030	1,810	4.87	5.43	108,000
May	4,800	2,070	3,590	9.65	11.12	221,000
June	7,170	2,700	4,380	11.8	13.17	261,000
July	3,670	1,290	2,190	5.89	6.79	135,000
August	1,530	605	1,030	2.77	3.19	63,500
September	715	334	486	1.31	1.46	28,900
The year	9,120	178	1,410	3.79	51.42	1,020,000

## LAKE CHELAN AT CHELAN, WASH.

LOCATION.—Water-stage recorder in lot 3, sec. 15, T. 27 N., R. 22 E., 2 miles west of Chelan. Gage datum is at mean sea level.

DRAINAGE AREA.—950 square miles.

RECORDS AVAILABLE.—September 1897 to December 1899; January to June 1905; and December 1910 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 1,099.74 feet Aug. 7; minimum, 1,088.02 feet Feb. 23.

1897-99, 1905, 1910-32: Maximum water-surface elevation, 1,099.88 feet July 13, 1930; minimum, 1,076.78 feet Jan. 27, 28, Dec. 2, 3, 1898.

REMARKS.—Records excellent. Lake level regulated under stipulation of Federal Power Commission for power and for scenic effect during tourist season. Gage-height record furnished by Chelan Electric Co.

*Gage height, in feet, 1931-32*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	94.25	91.12	89.62	88.18	88.38	90.15	92.02	95.15	97.15	99.16	99.66	99.39
2.....	94.19	91.13	89.58	88.13	88.35	90.34	92.10	95.40	97.30	99.19	99.67	99.33
3.....	94.06	91.06	89.54	88.13	88.32	90.44	92.20	95.64	97.49	99.26	99.67	99.25
4.....	93.90	91.01	89.46	88.13	88.30	90.58	92.30	95.90	97.69	99.35	99.68	99.21
5.....	93.84	91.01	89.37	88.13	88.28	90.76	92.36	96.15	97.80	99.34	99.69	99.18
6.....	93.74	91.02	89.30	88.11	88.26	90.83	92.39	96.31	97.94	99.24	99.72	99.13
7.....	93.61	91.06	89.27	88.12	88.24	90.89	92.44	96.48	98.05	99.16	99.69	99.12
8.....	93.51	91.05	89.20	88.11	88.23	90.91	92.47	96.59	98.16	99.15	99.69	99.13
9.....	93.45	91.00	89.12	88.13	88.22	90.97	92.50	96.66	98.33	99.16	99.65	99.08
10.....	93.35	90.94	89.03	88.13	88.23	91.00	92.55	96.73	98.57	99.24	99.57	98.96
11.....	93.26	90.87	88.95	88.34	88.20	91.02	92.57	96.69	98.78	99.31	99.52	99.04
12.....	93.13	90.80	88.86	88.39	88.19	91.03	92.64	96.66	98.91	99.33	99.48	98.91
13.....	93.03	90.75	88.77	88.39	88.18	91.08	92.72	96.66	99.05	99.38	99.43	98.83
14.....	92.91	90.73	88.64	88.40	88.15	91.16	92.91	96.67	99.05	99.43	99.42	98.79
15.....	92.80	90.65	88.56	88.40	88.15	91.18	93.05	96.60	99.10	99.48	99.45	98.72
16.....	92.68	90.61	88.48	88.43	88.14	91.20	93.21	96.51	99.03	99.52	99.44	98.67
17.....	92.56	90.58	88.48	88.41	88.11	91.25	93.36	96.41	98.74	99.53	99.48	98.68
18.....	92.40	90.52	88.48	88.43	88.10	91.31	93.49	96.34	98.58	99.49	99.53	98.59
19.....	92.28	90.51	88.48	88.45	88.09	91.38	93.66	96.35	98.60	99.43	99.56	98.46
20.....	92.20	90.43	88.45	88.46	88.11	91.45	93.78	96.42	98.69	99.35	99.55	98.43
21.....	92.03	90.36	88.46	88.46	88.08	91.50	93.87	96.52	98.90	99.31	99.53	98.38
22.....	91.92	90.31	88.42	88.47	88.05	91.52	93.94	96.61	99.10	99.37	99.53	98.29
23.....	91.84	90.23	88.40	88.46	88.05	91.56	94.01	96.63	99.16	99.44	99.51	98.23
24.....	91.70	90.15	88.40	88.46	88.03	91.68	94.07	96.69	99.09	99.45	99.51	98.20
25.....	91.66	90.10	88.38	88.47	88.07	91.72	94.16	96.72	99.05	99.53	99.50	98.12
26.....	91.59	90.06	88.36	88.48	88.28	91.74	94.26	96.70	98.99	99.53	99.52	98.04
27.....	91.48	89.93	88.37	88.48	88.89	91.78	94.42	96.72	98.98	99.53	99.53	98.00
28.....	91.38	89.89	88.37	88.48	89.54	91.81	94.57	96.76	99.03	99.62	99.55	97.94
29.....	91.30	89.81	88.31	88.47	89.93	91.82	94.73	96.83	99.12	99.65	99.53	97.89
30.....	91.23	89.69	88.24	88.42	-----	91.85	94.94	96.92	99.12	99.66	99.48	97.81
31.....	91.18	-----	88.22	88.41	-----	91.92	-----	97.03	-----	99.67	99.40	-----

NOTE.—Add 1,000 feet to obtain elevation above mean sea level.

## CHELAN RIVER AT CHELAN, WASH.

LOCATION.—Water-stage recorder in NE¼ sec. 30, T. 27 N., R. 23 E., half a mile above mouth and 2 miles southeast of Chelan. Gage datum is at mean sea level.

DRAINAGE AREA.—950 square miles.

RECORDS AVAILABLE.—November 1903 to September 1932.

EXTREMES.—Maximum mean daily discharge during year, 10,200 second-feet June 15; minimum, 42 second-feet Mar. 31.

1903-32: Maximum discharge, 11,600 second-feet June 8, 1921; no flow part of day Jan. 30, 1917, when lake outlet was blocked with ice, and at times during winter, owing to artificial regulation.

REMARKS.—Records good. Unmeasured diversion for irrigation above station is small proportion of run-off. Chelan Electric Co. diverts water from a point in town of Chelan for power purposes and for irrigation of small acreage. Such diversion included in daily discharge. Flow regulated by operation of power plant. Records of diversion, gage-height record, and discharge measurements furnished by Chelan Electric Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,470	966	1,700	960	555	400	505	720	2,140	4,250	1,560	1,410
2	2,420	1,540	1,500	770	552	400	771	934	1,740	4,250	1,640	1,410
3	2,530	1,670	1,510	320	547	397	619	1,010	1,600	4,080	1,640	1,460
4	2,220	814	1,720	261	552	399	919	1,030	2,190	3,930	1,630	1,290
5	2,190	683	1,300	260	670	392	843	1,500	2,050	4,140	1,520	1,240
6	2,190	792	1,220	249	714	401	730	2,440	2,140	4,180	1,830	1,410
7	2,310	789	1,420	359	706	617	930	3,600	2,180	3,620	2,080	1,470
8	1,530	1,320	1,540	256	555	652	908	4,270	2,200	2,690	2,190	1,460
9	1,750	1,720	1,770	254	555	815	799	5,110	2,220	2,290	2,270	1,470
10	2,350	1,690	1,630	257	549	836	916	6,190	3,000	2,170	2,290	1,210
11	1,910	1,580	1,650	249	425	698	888	6,850	5,850	2,240	2,250	943
12	2,290	1,640	1,390	266	402	665	893	6,860	7,070	2,280	1,920	1,390
13	2,390	1,450	1,340	266	398	651	946	6,950	8,980	1,650	1,390	1,320
14	2,470	1,280	1,680	273	395	778	923	6,920	10,100	1,440	1,680	1,330
15	2,490	1,160	1,810	254	398	821	906	6,660	10,200	2,080	1,650	1,460
16	2,470	1,600	1,670	254	395	816	940	6,700	10,100	2,250	1,140	1,460
17	2,470	1,010	1,110	252	502	826	910	6,310	9,120	2,570	1,140	1,460
18	2,450	1,240	735	314	408	839	887	5,630	5,750	3,040	1,140	1,250
19	2,470	1,150	714	249	402	619	972	5,280	3,850	3,050	1,200	1,350
20	2,470	1,460	718	255	398	633	874	4,800	3,840	2,970	1,130	1,410
21	2,450	1,470	711	364	404	775	914	4,410	3,960	2,520	1,140	1,480
22	2,440	1,360	711	255	398	1,010	925	4,300	5,570	2,120	1,120	1,480
23	2,290	1,570	711	269	403	735	970	3,860	7,380	2,110	1,130	1,460
24	2,100	1,600	711	256	406	779	802	3,300	6,510	1,970	1,560	1,370
25	1,530	1,700	707	255	411	743	924	3,290	5,700	2,070	1,390	1,240
26	1,920	1,330	708	254	411	785	924	3,110	5,710	2,120	1,390	1,390
27	2,190	1,480	717	254	400	777	930	2,860	4,600	1,790	1,480	1,410
28	1,780	1,480	847	333	400	775	946	2,160	4,170	1,430	1,170	1,450
29	1,730	1,540	1,000	516	397	779	994	2,020	4,390	1,490	1,270	1,550
30	1,390	1,640	1,120	526	-----	773	1,000	2,000	4,180	1,490	1,400	1,760
31	1,080	-----	1,030	554	-----	42	-----	2,120	-----	1,430	1,420	-----

Month	Observed				Gain or loss in storage in Chelan Lake (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre-feet		Run-off in acre-feet	Discharge in second-feet		Run-off in inches
	Maxi- mum	Mini- mum	Mean				Mean	Per square mile	
October	2,530	1,080	2,150	132,000	-103,000	29,000	472	.497	0.57
November	1,720	683	1,360	80,900	-47,200	33,700	566	.596	.66
December	1,810	707	1,200	73,800	-47,600	26,200	426	.448	.52
January	960	249	336	20,700	+7,400	28,100	457	.481	.55
February	714	395	473	27,200	+47,300	74,500	1,300	1.37	1.48
March	1,010	42	665	40,900	+65,100	106,000	1,720	1.81	2.09
April	1,000	505	880	52,400	+96,900	149,000	2,500	2.63	2.93
May	6,950	720	3,970	244,000	+67,500	312,000	5,070	5.34	6.16
June	10,200	1,600	4,950	295,000	+68,500	364,000	6,120	6.44	7.18
July	4,250	1,430	2,570	158,000	+17,400	175,000	2,850	3.00	3.46
August	2,290	1,050	1,500	92,200	-7,550	84,600	1,380	1.45	1.67
September	1,760	943	1,390	82,700	-51,700	31,500	529	.557	.62
The year	10,200	42	1,790	1,300,000	+114,000	1,410,000	1,950	2.05	27.89

## RAILROAD CREEK AT LUCERNE, WASH.

LOCATION.—Water-stage recorder in sec. 9, T. 31 N., R. 18 E., half a mile above mouth and southwest of Lucerne.

DRAINAGE AREA.—64 square miles.

RECORDS AVAILABLE.—December 1910 to June 1913; January 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 956 second-feet June 14 (gage height, 4.54 feet); minimum occurred during period of ice effect.

1910-13, 1927-32: Maximum discharge, 1,910 second-feet June 8, 1927 (gage height, 5.3 feet); minimum occurred during period Jan. 15-25, 1930, when stage-discharge relation was affected by ice.

REMARKS.—Records excellent except those for periods of ice effect, Nov. 21-23, 27-30, Dec. 10-15, Dec. 29 to Jan. 2, Jan. 13 to Feb. 7, which were estimated. Discharge also estimated Sept. 17-22. No diversions or regulation. Gage-height record and several discharge measurements furnished by Chelan Electric Co.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	52	36	30	25	336	137	460	422	606	206	99
2	52	75	36	30		266	143	466	466	584	206	94
3	51	68	36	32		210	140	460	507	548	221	82
4	49	59	36	32		188	140	480	534	520	232	82
5	52	54	36	32		175	140	527	486	434	241	91
6	52	63	36	32	29	159	134	548	447	378	236	107
7	49	91	36	32		143	131	591	460	348	232	119
8	46	79	36	30		131	128	591	513	354	232	125
9	44	70	34	30		122	131	591	591	342	206	101
10	44	61		29		110	134	621	690	415	185	94
11	42	54		70	29	101	146	598	804	384	162	89
12	42	56	30	56	29	99	172	606	839	314	153	79
13	40	61			29	99	214	628	902	330	134	79
14	39	59			28	96	280	628	911	342	131	94
15	37	52			28	94	280	570	902	330	160	96
16	37	46	30	40	27	91	275	520	762	330	192	89
17	37	42	36		28	96	306	513	598	330	221	84
18	37	40	44		28	110	349	534	527	302	206	79
19	37	39	34		29	128	254	556	513	262	185	74
20	37	36	34		28	119	232	628	527	266	169	69
21	36		33		28	113	221	598	666	302	159	64
22	37	35	33		28	113	210	548	796	342	150	59
23	37		32		28	110	206	507	788	342	153	54
24	37	36	32		33	113	199	466	682	342	156	56
25	40	39	32		47	110	206	409	628	324	162	63
26	40	37		30	236	107	228	366	591	290	165	59
27	39		33		784	104	266	336	584	271	169	56
28	42		33		628	107	319	314	614	280	165	56
29	46	35			453	110	390	324	666	271	137	59
30	44		30			110	434	336	636	232	116	59
31	46					119		378		214	101	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acres-feet
October	52	36	42.6	0.666	0.77	2,620
November	91		50.5	.789	.88	3,000
December	44		33.2	.519	.60	2,040
January	70		35.3	.552	.64	2,170
February	784		96.9	1.51	1.63	5,570
March	336	91	132	2.06	2.38	8,120
April	434	128	214	3.34	3.73	12,700
May	628	314	506	7.91	9.12	31,100
June	911	422	635	9.92	11.07	37,800
July	606	214	352	5.50	6.34	21,600
August	241	101	178	2.78	3.20	10,900
September	125	54	80.4	1.26	1.41	4,780
The year	911		196	3.06	41.77	142,000

## WENATCHEE RIVER BASIN

WENATCHEE RIVER AT PLAIN, WASH.<sup>5</sup>

LOCATION.—Water-stage recorder in lot 8, sec. 12, T. 26 N., R. 17 E.,  $\frac{1}{4}$  mile below Beaver Creek at Plain. Prior to Jan. 8, 1932, staff gage in SW  $\frac{1}{4}$  sec. 12, T. 26 N., R. 17 E., was used.

DRAINAGE AREA.—591 square miles.

RECORDS AVAILABLE.—November 1910 to September 1929; August 1931 to September 1932.

EXTREMES.—Maximum discharge during period August 1931 to September 1932, 10,800 second-feet Feb. 28 (gage height, 8.91 feet); minimum, probably below 400 second-feet some time during period of ice effect.

1910-29, 1931-32: Maximum discharge, 20,800 second-feet Dec. 13, 1921 (gage height, 11.8 feet); minimum, 250 second-feet Oct. 18, 19, 1925.

REMARKS.—Records good August to January and excellent thereafter, except those estimated because of ice, Dec. 13-17, Jan. 25 to Feb. 5, and others estimated Jan. 10-12, Aug. 21-23. Wenatchee Park Land & Irrigation Co. diverts a maximum of about 12 second-feet from Chiwawa River during irrigation seasons. No regulation.

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

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1931			1931			1931		
1		475	11	567	450	21	504	462
2		496	12	545	475	22	464	450
3	750	514	13	514	475	23	464	442
4		504	14	514	556	24	464	435
5		562	15	522	504	25	504	435
6	639	652	16	514	483	26	466	435
7	578	718	17	514	458	27	464	419
8	567	620	18	540	458	28	475	408
9	567	545	19	522	483	29	483	408
10	578	483	20	514	475	30	483	419
						31	483	

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1	419	732	514	462		6,640	2,500	5,580	4,900	5,240	1,630	600
2	442	1,170	514	450		5,070	2,750	5,580	5,070	5,240	1,580	589
3	435	1,090	522	450	500	4,080	2,680	5,580	5,240	4,900	1,580	556
4	435	952	522	442		3,460	2,620	5,750	5,580	5,070	1,580	532
5	504	842	522	442		3,090	2,560	6,100	5,240	4,400	1,680	527
6	483	902	522	462	509	2,880	2,440	6,280	4,900	3,760	1,630	540
7	483	1,900	536	462	514	2,500	2,340	6,640	4,760	3,460	1,630	556
8	475	1,580	522	450	522	2,280	2,220	6,820	4,900	3,310	1,580	589
9	450	1,440	514	471	527	2,060	2,170	7,000	5,580	3,160	1,440	606
10	435	1,280	514		540	1,900	2,170	7,380	6,460	3,310	1,400	562
11	435	1,140	496	1,100	532	1,780	2,220	7,380	7,380	3,460	1,300	540
12	419	995	450		514	1,630	2,390	7,190	8,360	3,090	1,260	518
13	419	1,300		1,400	504	1,580	2,950	7,380	9,160	3,020	1,170	496
14	408	1,300		1,220	479	1,480	3,920	7,570	9,570	2,950	1,120	492
15	408	1,160	400	1,040	466	1,440	4,240	6,820	9,780	2,820	1,130	492
16	401	1,060		978	454	1,400	4,240	6,280	9,160	2,680	1,210	487
17	397	1,020		910	435	1,480	4,160	6,100	7,760	2,680	1,300	492
18	397	918	450	859	435	1,820	3,920	6,280	6,640	2,560	1,350	471
19	387	893	483	816	438	2,750	3,840	6,280	5,920	2,390	1,300	458
20	387	893	504	791	458	2,680	3,610	6,640	5,920	2,280	1,210	522
21	387	800	514	732	475	2,500	3,380	6,640	6,100	2,340	1,110	504
22	397	732	514	702	483	2,390	3,160	6,280	7,000	2,440	1,010	479
23	401	632	504	632	483	2,280	3,020	5,920	7,380	2,440	913	458
24	401	658	504	606	496	2,280	2,880	5,410	6,640	2,440	816	446
25	408	658	504		692	2,280	2,950	4,900	6,100	2,390	816	450
26	435	639	496		2,920	2,170	3,310	4,400	5,750	2,220	834	442
27	435	567	496	550	8,450	2,110	3,840	4,000	5,580	2,060	834	435
28	462	504	483		10,600	2,110	4,400	3,840	5,580	2,060	825	431
29	578	504	475		8,960	2,170	4,730	4,080	5,750	2,000	757	431
30	632	504	442			2,110	5,240	4,240	5,750	1,840	688	431
31	658		462			2,280		4,560		1,680	626	

<sup>5</sup> Formerly published as Wenatchee River near Leavenworth, Wash.

Discharge, in second-feet, of Wenatchee River at Plain, Wash., 1931-32—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
1931						
August.....		475	559	0.946	1.09	34,400
September.....	718	408	490	.829	.92	29,200
The period.....						63,600
1931-32						
October.....	658	387	446	.755	.87	27,400
November.....	1,900	504	958	1.62	1.81	57,000
December.....	536		483	.817	.94	29,700
January.....		442	707	1.20	1.38	43,500
February.....	10,600	435	1,500	2.54	2.74	86,300
March.....	6,640	1,400	2,470	4.18	4.82	152,000
April.....	5,240	2,170	3,230	5.47	6.10	192,000
May.....	7,570	3,840	5,960	10.1	11.64	366,000
June.....	9,780	4,730	6,460	10.9	12.16	384,000
July.....	5,240	1,680	3,020	5.11	5.89	186,000
August.....	1,680	626	1,200	2.03	2.34	73,800
September.....	606	431	504	.853	.95	30,000
The year.....	10,600		2,240	3.79	51.64	1,630,000

## WENATCHEE RIVER AT PESHASTIN, WASH.

LOCATION.—Water-stage recorder in SE¼SW¼ sec. 8, T. 24 N., R. 18 E., 1 mile northwest of Peshastin. Prior to Apr. 22, 1932, staff gage in NW¼ sec. 21, T. 24 N., R. 18 E., 1,000 feet below highway bridge at Peshastin, was used.

DRAINAGE AREA.—1,000 square miles.

RECORDS AVAILABLE.—February 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 14,800 second-feet Feb. 28; minimum, 390 second-feet Oct. 19–21.

1929–32: Maximum discharge, that of Feb. 28, 1932; minimum, 270 second-feet Oct. 2, 1929 (gage height, 0.50 foot, staff-gage datum).

REMARKS.—Records good October to April, except those for Dec. 14–24 and Jan. 23 to Feb. 8, which were estimated because of ice. Records excellent May to September. Several diversions for irrigation above station. Slight regulation at mill pond at Leavenworth.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	A. g.	Sept.
1.....	470	862	625	568	600	8,790	3,580	7,510	6,500	7,300	1,830	714
2.....	490	1,350	692	568		6,890	3,970	7,510	6,900	6,900	1,870	700
3.....	515	1,350	692	540		5,410	3,970	7,300	7,100	7,100	1,820	664
4.....	450	1,180	692	540		4,820	3,730	7,510	7,510	7,100	1,820	646
5.....	515	1,060	692	540		4,450	3,580	8,150	7,100	6,110	1,870	630
6.....	655	1,060	655	568	730	4,090	3,500	8,370	6,500	5,200	1,820	625
7.....	595	2,450	655	568		3,580	3,360	9,040	6,300	4,690	1,760	635
8.....	568	2,080	655	540		3,240	3,140	9,270	6,700	4,530	1,760	658
9.....	515	1,830	655	568		2,920	3,000	9,500	7,510	4,370	1,890	700
10.....	515	1,590	625	625		730	2,770	3,000	10,200	9,270	4,370	1,490
11.....	490	1,410	625	1,230	692	2,480	3,070	10,200	10,700	4,690	1,790	630
12.....	470	1,290	655	2,340	655	2,340	3,280	9,980	11,900	4,210	1,700	610
13.....	450	1,410	625	1,830	655	2,210	4,050	10,500	13,100	4,050	1,160	582
14.....	450	1,710	625	1,710	595	2,210	5,380	10,500	13,600	4,050	1,120	566
15.....	430	1,530	625	1,350	595	2,080	5,740	9,500	13,800	3,810	1,090	566
16.....	430	1,410	625	1,290	568	1,950	5,560	8,590	12,900	3,580	1,120	562
17.....	430	1,290	625	1,180	515	2,210	5,610	8,370	10,700	3,580	1,200	554
18.....	410	1,230	625	1,180	470	2,920	5,200	8,590	9,040	3,430	1,250	550
19.....	390	1,230	600	1,120	595	4,270	5,200	8,810	8,370	3,140	1,200	534
20.....	390	1,120	600	1,060	595	4,090	4,860	9,500	8,370	3,000	1,120	603
21.....	390	1,010	600	1,060	692	3,750	4,370	9,270	8,810	3,000	1,040	652
22.....	430	960	625	910	625	3,580	4,370	8,590	10,200	3,210	1,040	595
23.....	430	862	625	625	625	3,240	4,050	7,930	10,200	3,210	1,040	570
24.....	450	815	625	625	625	3,140	3,970	7,300	9,270	3,140	1,040	562
25.....	470	910	625	625	960	3,360	3,970	6,500	8,370	3,070	976	558
26.....	490	862	625	650	6,030	3,140	4,370	5,740	7,930	2,870	976	562
27.....	515	815	625	650	14,000	3,000	5,030	5,380	7,510	2,610	992	550
28.....	625	655	625	625	14,800	3,070	5,920	5,200	7,720	2,540	984	546
29.....	772	595	595	595	12,000	3,140	6,500	5,380	7,720	2,480	920	542
30.....	772	625	595	595	-----	3,070	6,900	5,740	7,720	2,230	880	538
31.....	815	-----	595	595	-----	3,210	-----	6,110	-----	2,110	785	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	815	390	509	31,300
November.....	2,450	595	1,220	72,600
December.....	692	-----	627	38,600
January.....	2,340	540	895	55,000
February.....	14,800	470	2,160	124,000
March.....	8,790	1,950	3,530	217,000
April.....	6,900	3,000	4,410	262,000
May.....	10,500	5,200	8,130	500,000
June.....	13,800	6,300	8,980	534,000
July.....	7,300	2,110	4,050	249,000
August.....	1,930	785	1,300	79,900
September.....	714	534	602	35,800
The year.....	14,800	390	3,030	2,200,000



## YAKIMA RIVER BASIN

## YAKIMA RIVER NEAR MARTIN, WASH.

LOCATION.—Water-stage recorder below dam at outlet of Keechelus Lake, 3½ miles northwest of Martin.

DRAINAGE AREA.—55 square miles.

RECORDS AVAILABLE.—October 1903 to September 1932.

EXTREMES.—Maximum discharge during year, 1,610 second-feet July 28 to Aug. 15 (gage height, 8.5 feet); minimum, 1 second-foot Oct. 20 to Feb. 26, Feb. 29 to Mar. 24, Mar. 27, 28; result of regulation.

1903-32: Maximum discharge, 7,370 second-feet Mar. 25, 1915, when temporary crib dam was washed out; practically no flow when gates in Keechelus Reservoir Dam are closed.

REMARKS.—Records excellent except those for extremely low flow. No diversions above station. Flow partly controlled by storage and release of water at Keechelus Reservoir. 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.....	94	1	1	1	1	1	2	2	842	966	1,610	1,570
2.....	100	1	1	1	1	1	2	3	858	988	1,610	1,570
3.....	92	1	1	1	1	1	2	2	843	890	1,610	1,570
4.....	87	1	1	1	1	1	2	2	843	819	1,610	1,570
5.....	46	1	1	1	1	1	2	2	815	752	1,610	1,570
6.....	14	1	1	1	1	1	2	2	732	637	1,610	1,520
7.....	13	1	1	1	1	1	2	2	692	434	1,610	1,430
8.....	13	1	1	1	1	1	2	2	664	387	1,610	1,340
9.....	30	1	1	1	1	1	2	4	786	387	1,610	1,260
10.....	89	1	1	1	1	1	2	298	1,030	387	1,610	1,130
11.....	109	1	1	1	1	1	2	716	1,340	387	1,610	1,050
12.....	77	1	1	1	1	1	2	842	1,420	387	1,610	948
13.....	56	1	1	1	1	1	2	871	1,490	387	1,610	854
14.....	56	1	1	1	1	1	2	928	1,420	387	1,610	766
15.....	56	1	1	1	1	1	2	857	1,310	387	1,610	700
16.....	56	1	1	1	1	1	2	745	1,010	387	1,570	638
17.....	56	1	1	1	1	1	2	745	819	387	1,570	580
18.....	56	1	1	1	1	1	3	785	780	387	1,570	511
19.....	24	1	1	1	1	1	3	842	761	387	1,570	446
20.....	1	1	1	1	1	1	3	958	780	387	1,570	410
21.....	1	1	1	1	1	1	3	1,000	789	387	1,570	365
22.....	1	1	1	1	1	1	3	1,000	942	410	1,570	322
23.....	1	1	1	1	1	1	2	1,000	956	446	1,570	283
24.....	1	1	1	1	1	1	2	973	845	472	1,570	240
25.....	1	1	1	1	1	2	2	771	792	485	1,570	201
26.....	1	1	1	1	1	2	2	637	711	524	1,570	180
27.....	1	1	1	1	2	1	2	587	698	552	1,570	163
28.....	1	1	1	1	2	1	2	574	684	1,420	1,570	153
29.....	1	1	1	1	1	2	2	625	659	1,610	1,570	141
30.....	1	1	1	1	1	2	2	771	647	1,610	1,570	131
31.....	1	1	1	1	1	2	2	842	1,610	1,570	1,570	131

Month	Observed				Gain or loss in storage in Lake Keechelus (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre-feet		Run-off in acre-feet	Discharge in second-feet		Run-off in inches
	Maxi- mum	Mini- mum	Mean				Mean	Per square mile	
October	109	1	36.6	2,250	+7,290	9,540	155	2.82	3.25
November	1	1	1.00	59.5	+19,500	19,600	329	5.98	6.67
December	1	1	1.00	61.5	+7,460	7,520	122	2.22	2.56
January	1	1	1.00	61.5	+18,000	18,100	284	5.35	6.17
February	2	1	1.07	61.5	+22,100	22,200	366	7.02	7.57
March	2	1	1.16	71.4	+32,100	32,200	524	9.53	10.99
April	3	2	2.17	129	+32,300	32,400	544	9.89	11.03
May	1,000	2	561	34,500	+16,300	50,800	836	15.0	17.29
June	1,490	647	898	53,500	-540	53,000	891	16.2	18.07
July	1,610	387	646	39,700	-21,000	18,700	304	5.53	6.38
August	1,610	1,570	1,590	97,700	-89,800	7,900	128	2.33	2.69
September	1,570	131	787	46,800	-42,500	4,300	72.3	1.31	1.46
The year..	1,610	1	379	275,000	+1,210	276,000	381	6.93	94.13

## YAKIMA RIVER AT CLE ELUM, WASH.

LOCATION.—Water-stage recorder in sec. 27, T. 20 N., R. 15 E., at highway bridge at Cle Elum, just above Roslyn Creek.

DRAINAGE AREA.—500 square miles.

RECORDS AVAILABLE.—August 1906 to September 1932.

EXTREMES.—Maximum discharge during year, 9,420 second-feet Feb. 28 (gage height, 8.57 feet); minimum, 190 second-feet Oct. 20 (gage height, 2.00 feet).

1906-32: Maximum discharge, about 25,600 second-feet Nov. 14, 1906 (gage height, 12.5 feet, from high-water marks); minimum, 64 second-feet Nov. 16, 17, 1929.

REMARKS.—Records excellent. Kittitas Canal diverts above gage. Diversions included in monthly discharge table. Flow partly regulated by several reservoirs upstream. 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	416	848	455	339	490	5,880	2,590	4,230	3,470	2,190	2,380	2,070
2	410	648	450	330	442	4,500	2,870	4,230	3,630	2,380	2,380	2,020
3	495	880	430	322	432	3,470	3,010	4,140	3,720	2,590	2,450	1,960
4	776	915	420	330	437	2,370	2,870	3,970	3,800	2,590	2,450	1,900
5	915	880	402	330	437	3,550	2,730	4,230	3,800	2,660	2,520	1,960
6	750	738	388	380	422	3,970	2,450	4,410	3,310	2,590	2,590	1,960
7	678	815	393	393	427	3,240	2,260	4,600	3,010	2,380	2,580	1,850
8	592	1,020	398	398	422	2,380	2,070	4,690	2,940	2,190	2,660	1,540
9	470	1,060	384	500	422	2,380	1,960	4,690	3,080	2,190	2,660	1,440
10	398	1,020	380	624	427	2,450	1,850	5,080	3,630	2,190	2,730	1,440
11	380	950	384	1,220	427	1,850	2,020	5,480	4,780	2,260	2,730	1,400
12	339	848	375	2,070	417	1,640	2,070	5,480	5,880	2,260	2,730	1,400
13	286	880	357	2,130	403	1,490	2,260	5,480	5,880	2,190	2,660	1,400
14	262	1,020	344	1,900	365	1,400	3,470	5,480	5,880	2,190	2,660	1,400
15	252	1,020	330	1,540	398	1,300	3,720	5,080	5,680	2,130	2,660	1,350
16	238	985	334	1,440	355	1,260	3,390	4,690	5,280	2,130	2,590	1,400
17	224	950	339	1,300	328	1,540	3,010	4,500	4,500	2,070	2,520	1,440
18	214	915	362	1,170	303	2,070	3,010	4,500	3,720	2,020	2,590	1,400
19	205	915	370	1,090	320	2,370	3,310	4,600	3,310	2,020	2,590	1,440
20	193	880	394	1,010	337	3,160	3,160	4,880	3,010	2,020	2,590	1,400
21	388	802	388	932	383	3,010	2,870	4,880	3,080	2,070	2,590	1,220
22	357	738	388	856	412	3,800	2,660	4,690	3,390	2,130	2,660	1,260
23	366	684	393	769	398	2,590	2,380	4,500	3,720	2,190	2,450	1,220
24	310	648	388	756	432	3,010	2,260	4,230	3,550	2,190	2,380	1,220
25	375	630	384	677	539	2,940	2,130	3,880	3,240	2,190	2,380	1,220
26	402	592	375	640	1,740	2,590	2,190	3,240	3,310	2,190	2,320	1,220
27	470	564	375	609	6,720	2,260	2,520	2,870	2,870	2,190	2,320	1,170
28	564	520	362	603	8,730	2,190	3,010	2,590	3,010	2,260	2,320	1,220
29	672	490	352	568	7,380	2,260	3,470	2,660	2,520	2,260	2,260	1,220
30	776	470	352	556	-----	2,320	3,880	2,870	2,260	2,320	1,960	1,220
31	848	-----	344	509	-----	2,380	-----	3,240	-----	2,320	2,070	-----

Month	Observed				Gain or loss in storage in Lakes Keeche- lus, Kachess, and Cle Elum (acre-feet)	Diverted by Kittitas Canal (acre-feet)	Corrected for storage and diversions			
	Discharge in second-feet			Run-off in acre-feet			Run-off in inches	Discharge in second-feet		Run-off in inches
	Maxi- mum	Mini- mum	Mean					Mean	Per square mile	
October .....	915	193	453	27,900	+31,900	-----	59,800	973	1.95	2.25
November .....	1,060	470	811	48,200	+30,000	-----	78,200	1,310	2.62	2.92
December .....	455	330	380	33,400	+14,500	-----	47,900	779	1.56	1.80
January .....	2,130	322	848	52,100	+30,800	-----	82,900	1,350	2.70	3.11
February .....	8,730	303	1,200	68,900	+62,600	-----	132,000	2,290	4.58	4.94
March .....	5,880	1,260	2,670	164,000	+54,300	-----	218,000	3,550	7.10	8.19
April .....	3,880	1,850	2,720	162,000	+70,600	-----	233,000	3,920	7.84	8.75
May .....	5,480	2,590	4,330	266,000	+62,700	7,390	336,000	5,460	10.9	12.57
June .....	5,880	2,260	3,780	225,000	+33,200	24,800	283,000	4,760	9.52	10.62
July .....	2,660	2,020	2,250	138,000	-65,100	36,800	110,000	1,790	3.58	4.13
August .....	2,730	1,960	2,500	154,000	-140,000	27,300	41,300	672	1.34	1.54
September .....	2,070	1,170	1,480	88,000	-86,700	22,300	23,600	397	.794	.89
The year .....	8,730	193	1,950	1,420,000	+98,800	119,000	1,650,000	2,270	4.54	61.71

## YAKIMA RIVER NEAR PARKER, WASH.

LOCATION.—Water-stage recorder in sec. 28, T. 12 N., R. 19 E., below Sunnyside diversion dam  $1\frac{1}{2}$  miles east of Parker.

DRAINAGE AREA.—3,560 square miles.

RECORDS AVAILABLE.—April 1908 to September 1921; October 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 17,100 second-feet Feb. 28, 29 (gage height, 9.90 feet); practically no flow Oct. 1-3.

1908-21, 1931-32: Maximum discharge, 52,900 second-feet Dec. 30, 1917 (gage height, 15.0 feet); practically no flow on several days during latter part of irrigation seasons as result of diversion.

REMARKS.—Records good. Water diverted above gage for irrigation of a large area. Flow partly regulated by diversions and by several reservoirs upstream. Gage-height record and most of discharge measurements furnished by United States Bureau of Reclamation. Records of monthly discharge of canals furnished by United States Office of Indian Affairs and 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	1	1,290	1,340	918	1,290	13,500	5,300	4,970	3,170	1,390	84	258
2	1	1,400	1,340	909	1,340	10,400	6,240	5,640	3,330	1,190	44	266
3	1	1,260	1,290	900	1,280	8,240	6,620	5,640	3,490	1,150	18	238
4	2	1,340	1,220	918	1,290	6,880	6,360	5,300	3,830	1,440	10	214
5	92	1,400	1,180	945	1,290	6,360	5,870	5,520	3,920	1,340	26	194
6	374	1,340	1,100	964	1,560	9,750	4,970	6,110	3,490	991	77	210
7	275	1,290	1,090	1,010	1,610	8,530	4,370	6,360	2,800	756	145	122
8	226	1,620	1,080	1,080	1,560	6,880	3,830	6,620	2,460	315	190	202
9	197	1,740	1,050	1,110	1,340	5,640	3,410	6,880	2,460	202	218	96
10	127	1,800	1,010	1,230	1,310	5,410	3,170	7,410	3,170	270	477	12
11	78	1,740	973	1,720	1,260	4,970	3,170	7,960	4,370	438	532	8
12	74	1,800	909	4,970	1,210	4,180	3,660	7,680	6,240	360	258	52
13	78	1,800	973	4,660	1,220	3,920	4,370	7,680	7,410	210	190	194
14	50	1,860	918	4,090	1,170	3,660	5,990	8,240	7,960	155	183	77
15	13	2,110	780	3,490	1,110	3,330	7,410	7,680	7,680	132	190	26
16	7	2,110	772	3,020	1,150	3,170	6,880	6,620	7,960	109	138	77
17	9	2,050	857	2,800	1,150	3,330	6,110	5,520	6,880	50	34	122
18	7	1,920	1,110	2,460	1,120	5,640	5,520	5,300	5,300	41	15	148
19	8	1,860	1,220	2,260	1,150	8,530	5,190	5,520	4,460	16	62	218
20	118	1,860	1,290	2,200	1,280	8,830	5,870	5,870	3,830	84	166	315
21	331	1,860	1,340	2,080	1,390	7,960	4,760	6,620	3,660	109	183	266
22	432	1,620	1,240	1,960	1,250	6,880	3,830	6,240	4,180	109	258	148
23	615	1,620	1,160	1,900	1,170	5,760	3,020	5,520	4,760	54	210	104
24	622	1,620	1,080	1,610	1,560	5,760	2,260	4,760	4,560	122	74	66
25	615	1,620	1,040	1,610	2,260	6,360	1,840	4,090	3,740	148	12	23
26	668	1,510	1,000	1,660	4,460	5,640	1,720	3,410	3,250	101	89	46
27	731	1,400	945	1,610	13,100	4,970	2,200	2,660	3,020	117	58	112
28	756	1,260	982	1,500	16,800	4,560	3,020	2,140	2,730	52	25	158
29	900	1,220	918	1,610	16,400	4,660	3,920	1,960	2,590	86	66	155
30	1,130	1,270	909	1,560	-----	4,460	4,370	2,330	2,080	72	250	194
31	1,230	-----	1,000	1,340	-----	4,660	-----	2,800	-----	96	183	-----

Month	Mean discharge in second-feet					Gain or loss by upstream storage (second-feet)	Combined flow of Yakima River and Canals corrected for upstream storage	
	Yakima River near Parker	Union Gap Canal (estimated)	New Reservation Canal	Old Reservation Canal	Sunnyside Canal		Second-feet	Run-off in acre-feet <sup>a</sup>
October	315	14	446	-----	242	1,020	+555	1,580 97,200
November	1,620	-----	123	-----	-----	1,740	+645	2,380 142,000
December	1,070	-----	-----	-----	-----	1,070	+412	1,480 91,000
January	1,940	-----	-----	-----	-----	1,940	+737	2,680 165,000
February	2,900	-----	-----	-----	-----	2,900	+1,480	4,380 252,000
March	6,220	-----	116	31.0	210	6,880	+1,796	8,370 515,000
April	4,510	27	1,060	91.6	909	6,600	+1,790	8,390 499,000
May	5,520	46	1,920	146	1,290	8,920	+1,890	10,800 664,000
June	4,290	46	1,630	126	1,270	7,330	+1,040	8,400 500,000
July	378	45	1,680	127	1,300	3,330	-1,400	2,180 131,000
August	144	43	1,520	78.1	1,260	3,050	-2,926	130 7,900
September	144	30	910	-----	1,060	2,140	-2,140	0 0
The year	2,420	-----	-----	-----	-----	3,900	+317	4,220 3,060,000

<sup>a</sup> Totals are comparable with monthly results previously determined for Yakima River at Union Gap, near Yakima, Wash.

## YAKIMA RIVER NEAR PROSSER, WASH.

LOCATION.—Water-stage recorder in SE¼ sec. 36, T. 9 N., R 24 E., 1¼ miles northeast of Prosser.

DRAINAGE AREA.—5,340 square miles.

RECORDS AVAILABLE.—June 1904 to October 1906, August 1913 to October 1918, April 1919 to September 1922, October 1926 to September 1932.

EXTREMES.—Maximum discharge during year, 18,300 second-feet Mar. 1 (gage height, 10.35 feet); minimum, 289 second-feet Sept. 17 (gage height, 0.9C foot).

1904-6, 1913-22, 1926-32: Maximum discharge, about 62,800 second-feet Nov. 17, 1906; minimum, about 40 second-feet Aug. 19, 26, 30, 31, Sept. 30, 1906.

REMARKS.—Records excellent. Water diverted above gage for irrigation of large acreage. Monthly discharge corrected for diversion through Prosser power canal which passes station. Flow partly regulated by diversions and by storage and release of water in several reservoirs upstream. 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	813	1,680	1,580	1,390	1,390	18,100	5,640	5,180	4,220	3,070	1,100	1,180
2	825	1,730	1,530	1,390	1,480	16,400	6,420	5,740	4,820	2,400	1,060	1,220
3	800	1,830	1,530	1,340	1,580	12,600	7,300	6,130	5,180	2,160	1,060	302
4	769	1,780	1,630	1,340	1,530	9,720	7,520	6,330	5,180	2,050	1,020	939
5	769	1,830	1,630	1,340	1,480	8,000	7,070	6,130	5,360	2,220	1,020	1,220
6	756	1,830	1,580	1,340	1,530	8,240	6,420	6,530	5,360	2,160	950	1,350
7	793	1,830	1,530	1,390	1,830	9,720	6,020	6,950	5,360	1,940	980	1,350
8	918	1,830	1,530	1,390	1,780	9,210	5,460	7,160	4,650	1,780	1,020	1,260
9	953	1,990	1,480	1,440	1,830	7,520	4,920	7,160	4,060	1,580	980	1,220
10	918	2,100	1,480	1,480	1,880	6,420	4,580	7,380	3,980	1,350	1,020	1,020
11	953	2,100	1,440	1,880	1,830	6,220	4,240	8,060	4,310	1,260	1,140	787
12	918	2,100	1,440	3,220	1,780	5,640	4,410	8,540	5,360	1,350	1,350	643
13	918	2,160	1,340	5,100	1,680	4,920	4,750	8,540	6,950	1,350	1,260	481
14	884	2,100	1,300	5,100	1,680	4,580	5,310	8,540	8,060	1,260	1,180	463
15	884	2,100	1,220	4,580	1,580	4,240	6,750	8,790	8,300	1,260	1,020	459
16	884	2,160	1,100	3,910	1,530	4,080	7,660	8,300	8,300	1,220	1,050	377
17	884	2,220	1,100	3,440	1,530	3,990	7,140	7,380	8,060	1,260	1,140	309
18	851	2,160	1,260	3,220	1,480	4,580	6,590	6,530	7,380	1,260	1,100	358
19	851	2,160	1,440	3,220	1,480	6,640	6,030	6,530	6,130	1,300	1,020	477
20	825	2,100	1,630	3,070	1,530	8,960	6,360	6,740	5,360	1,350	985	504
21	825	2,100	1,730	2,860	1,880	8,960	6,200	7,380	4,820	1,350	1,100	538
22	953	2,100	1,780	2,720	1,990	8,240	5,350	7,830	4,650	1,350	1,140	533
23	1,100	2,050	1,730	2,530	1,830	7,300	4,560	7,380	5,180	1,350	1,100	477
24	1,140	1,940	1,630	2,280	1,880	6,850	3,680	6,740	5,360	1,350	1,060	437
25	1,180	1,940	1,580	2,050	3,000	7,070	3,140	6,130	5,190	1,300	1,060	385
26	1,180	1,940	1,580	1,940	4,580	7,300	2,740	5,550	4,480	1,300	1,060	373
27	1,220	1,880	1,480	2,050	8,000	6,640	2,660	4,820	4,140	1,180	1,020	377
28	1,260	1,830	1,440	1,940	12,900	6,020	3,000	4,140	3,900	1,180	1,140	385
29	1,300	1,830	1,440	1,830	16,400	6,020	3,820	3,580	3,740	1,060	1,100	450
30	1,340	1,680	1,390	1,940	-----	5,830	4,650	3,510	3,440	1,060	1,100	490
31	1,580	-----	1,390	1,780	-----	5,640	-----	3,900	-----	1,100	1,220	-----

Month	Observed discharge in second-feet				Combined river and power canal <sup>a</sup>	
	River			Prosser Power Canal (mean)	Mean in second-feet	Run-off in acre-feet
	Maximum	Minimum	Mean			
October	1,580	756	976	-----	976	60,000
November	2,220	1,680	1,970	-----	1,970	117,000
December	1,780	1,100	1,480	-----	1,480	91,100
January	5,100	1,340	2,400	-----	2,400	148,000
February	16,400	1,390	2,930	-----	2,930	168,000
March	18,100	3,990	7,600	-----	7,600	467,000
April	7,660	2,740	5,350	-----	5,350	318,000
May	8,790	3,510	6,570	-----	6,570	404,000
June	8,300	3,440	5,380	-----	5,380	320,000
July	3,070	1,060	1,520	-----	1,520	93,500
August	1,350	950	1,080	-----	1,080	66,000
September	1,350	302	679	-----	1,110	66,100
The year	18,100	302	3,160	-----	3,190	2,320,000

<sup>a</sup> Small percentage of flow escaping from power canal through siphon spillway not accounted for in these totals.

## KACHESS RIVER NEAR EASTON, WASH.

LOCATION.—Water-stage recorder in sec. 3, T. 20 N., R. 13 E., three quarters of a mile below Kachess Lake and 2 miles northwest of Easton.

DRAINAGE AREA.—64 square miles.

RECORDS AVAILABLE.—November 1903 to September 1932.

EXTREMES.—Maximum discharge during year, 1,380 second-feet July 25–27 (gage height, 5.50 feet); no flow Nov. 11 to Feb. 26.

1903–32: Maximum discharge, 2,240 second-feet Aug. 27, 1920 (computed from gate opening); practically no flow when gates in dam are closed.

REMARKS.—Records excellent except those for extremely low flow. Leakage, when gates are closed, based on current-meter measurements. No diversions. Flow regulated by Kachess Lake Reservoir. Records furnished by United States Bureau of Reclamation.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	165	4	0	2	5	5	2	424	525	369
2.	154	4	0	2	6	5	2	394	568	369
3.	145	4	0	1	6	5	2	387	613	369
4.	137	5	0	1	6	5	2	443	659	361
5.	99	7	0	1	6	5	2	483	732	405
6.	4	7	0	2	6	5	2	483	781	428
7.	8	9	0	2	6	5	2	483	832	213
8.	32	10	0	1	6	5	2	568	857	93
9.	34	11	0	1	6	5	2	659	908	125
10.	48	3	0	1	6	4	2	781	908	216
11.	35	0	0	1	6	3	2	832	934	314
12.	16	0	0	1	6	3	2	882	959	424
13.	4	0	0	1	6	3	2	882	934	525
14.	2	0	0	1	6	3	2	908	908	613
15.	2	0	0	1	6	3	2	908	882	707
16.	2	0	0	1	6	3	2	934	832	806
17.	2	0	0	1	6	3	2	908	832	882
18.	2	0	0	2	6	3	2	908	832	959
19.	2	0	0	2	5	3	2	985	857	1,010
20.	2	0	0	2	5	2	2	1,060	882	985
21.	2	0	0	2	5	2	2	1,170	857	1,010
22.	2	0	0	3	5	2	2	1,240	781	1,060
23.	2	0	0	3	5	2	2	1,270	670	1,060
24.	2	0	0	3	5	2	2	1,320	613	1,060
25.	2	0	0	3	5	2	2 <sup>a</sup>	1,380	613	1,120
26.	2	0	0	3	5	2	5 <sup>a</sup>	1,380	613	1,140
27.	2	0	3	4	5	2	475	1,380	613	1,190
28.	3	0	3	4	5	2	455	1,050	613	1,220
29.	3	0	2	4	5	2	455	401	349	1,240
30.	3	0	—	4	5	2	451	439	206	1,190
31.	3	—	—	5	—	2	—	479	369	—

Month	Observed				Gain or loss in storage in Lake Kachess (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre- feet		Run-off in acre- feet	Discharge in second-feet		Run-off in inches
	Maxi- mum	Mini- mum	Mean				Mean	Per square mile	
October	165	2	29.70	1,830	+3,900	5,760	93.7	1.46	1.68
November	11	0	2.13	127	+12,700	12,800	215	3.36	3.75
December	0	0	.00	0	+7,420	7,420	121	1.89	2.18
January	0	0	.00	0	+11,800	11,800	192	3.00	3.46
February	3	0	.28	15.9	+25,700	25,700	447	6.98	7.53
March	5	1	2.10	129	+33,800	33,900	551	8.61	9.93
April	6	5	5.57	331	+34,100	34,400	578	9.03	10.08
May	5	2	3.23	198	+48,000	48,200	784	12.2	14.07
June	504	2	89.10	5,300	+35,800	41,100	691	10.8	12.05
July	1,380	387	833	51,200	-37,000	14,200	231	3.61	4.16
August	959	206	727	44,700	-42,100	2,600	42.3	.661	.76
September	1,240	93	717	42,700	-41,200	1,500	25.2	.394	.44
The year	1,380	0	202	147,000	+93,000	239,000	330	5.16	70.06

## CLE ELUM RIVER NEAR ROSLYN, WASH.

LOCATION.—Staff gage in sec. 10, T. 20 N., R. 14 E., below Cle Elum Lake and 4 miles northwest of Roslyn. Prior to Sept. 4, 1931, a water-stage recorder was in operation.

DRAINAGE AREA.—202 square miles.

RECORDS AVAILABLE.—October 1903 to September 1932.

EXTREMES.—Maximum discharge during year, 6,480 second-feet Feb. 27 (gage height, 8.39 feet); minimum, 122 second-feet Oct. 20 (gage height, 1.50 feet).

1903-32: Maximum discharge, 18,700 second-feet Nov. 15, 1906 (gage height, 14.05 feet); practically no flow Sept. 28, 1914.

REMARKS.—Records excellent. No diversions above station. Flow partly controlled at Cle Elum Lake Reservoir. 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	142	563	298	231	417	3,880	1,280	2,670	2,120	1,280	725	346
2	151	521	292	222	389	3,160	1,450	2,730	2,280	1,320	697	341
3	254	699	288	214	389	2,410	1,570	2,610	2,390	1,400	675	333
4	559	699	282	211	381	2,090	1,570	2,550	2,500	1,440	658	325
5	266	647	263	211	366	2,130	1,450	2,850	2,440	1,480	637	310
6	508	602	251	217	366	2,270	1,310	3,100	2,220	1,480	626	302
7	499	699	260	217	370	2,000	1,140	3,230	2,070	1,480	610	294
8	417	834	263	217	377	1,800	1,000	3,290	2,070	1,440	594	287
9	362	889	257	239	385	1,610	905	3,230	2,220	1,400	584	280
10	305	861	242	248	397	1,450	874	3,430	2,610	1,360	563	272
11	266	779	239	397	405	1,350	874	3,560	3,700	1,360	553	265
12	222	726	231	752	409	1,210	937	3,430	4,120	1,320	538	258
13	201	726	225	974	405	1,150	1,140	3,430	4,120	1,280	523	251
14	198	752	222	974	393	1,090	1,560	3,560	4,120	1,240	508	244
15	181	779	206	1,000	385	1,060	2,070	3,290	4,120	1,210	499	238
16	160	752	201	917	377	1,000	2,170	2,910	3,830	1,170	484	231
17	151	726	220	889	366	1,030	2,120	2,730	3,290	1,140	475	224
18	142	673	231	834	355	1,150	2,020	2,730	2,850	1,100	466	218
19	136	673	242	806	351	1,680	1,970	2,790	2,500	1,070	451	218
20	140	647	251	752	370	2,050	1,830	2,910	2,330	1,000	437	218
21	370	597	254	699	393	2,090	1,690	2,970	2,330	969	428	218
22	330	544	251	632	397	2,000	1,520	2,790	2,550	937	419	221
23	285	503	248	578	393	1,840	1,400	2,610	2,730	905	410	221
24	393	463	251	544	417	1,760	1,360	2,440	2,610	905	401	221
25	438	442	248	512	459	1,680	1,280	2,170	2,390	874	393	218
26	373	409	251	490	1,180	1,610	1,320	1,920	2,170	874	384	221
27	344	393	239	485	5,650	1,530	1,480	1,730	2,070	843	401	218
28	336	366	236	481	6,210	1,450	1,870	1,600	1,970	813	371	211
29	405	336	228	463	5,230	1,490	2,330	1,640	1,400	783	367	205
30	517	316	225	442	-----	1,250	2,500	1,730	1,210	783	358	205
31	568	-----	225	425	-----	1,180	-----	1,920	-----	754	354	-----

Month	Observed				Gain or loss in storage in Lake Cle Elum (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre- feet		Run-off in acre- feet	Discharge in second-feet		Run-off in inches
	Maximum	Minimum	Mean				Mean	Per square mile	
October.....	568	136	310	19, 100	+20, 700	39, 800	647	3. 26	3. 69
November.....	889	316	621	36, 900	-2, 180	34, 700	583	2. 85	3. 22
December.....	298	201	246	15, 100	-390	14, 700	239	1. 16	1. 36
January.....	1, 000	211	525	32, 300	+965	33, 300	542	2. 68	3. 09
February.....	6, 210	351	965	55, 500	+14, 800	70, 300	1, 220	6. 04	6. 51
March.....	3, 880	1, 000	1, 720	106, 000	-11, 600	94, 400	1, 540	7. 62	8. 78
April.....	2, 500	874	1, 530	91, 200	+4, 220	95, 400	1, 600	7. 92	8. 84
May.....	3, 560	1, 600	2, 730	168, 000	-1, 630	166, 000	2, 700	13. 4	15. 45
June.....	4, 120	1, 210	2, 640	157, 000	-2, 020	155, 000	2, 600	12. 9	14. 39
July.....	1, 480	754	1, 140	70, 200	-7, 140	63, 100	1, 030	5. 10	5. 88
August.....	725	354	503	30, 900	-7, 920	23, 000	374	1. 85	2. 13
September.....	346	205	254	15, 100	-3, 010	12, 100	203	1. 00	1. 12
The year.....	6, 210	136	1, 100	797, 000	+4, 800	802, 000	1, 100	5. 45	74. 46

## BUMPING RIVER NEAR NILE, WASH.

LOCATION.—Water-stage recorder a quarter of a mile below spillway of Bumping Lake Dam and 19 miles west of Nile.

DRAINAGE AREA.—68 square miles.

RECORDS AVAILABLE.—June to July 1906; April 1909 to September 1932.

EXTREMES.—Maximum discharge during year, 1,620 second-feet June 15 (gage height, 4.87 feet); no flow Nov. 10, 11.

1906, 1909-32: Maximum discharge, 5,180 second-feet Dec. 29, 1917 (gage height, 9.33 feet); practically no flow when gates in outlet conduit are closed.

REMARKS.—Records excellent. No diversions above station. Flow partly regulated by Bumping Lake Reservoir. 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.....	31	108	162	53	157	33	17	561	746	601	242	400
2.....	31	123	157	68	206	28	42	616	777	558	242	400
3.....	31	134	127	132	206	23	191	647	777	574	260	400
4.....	31	125	123	138	206	21	290	651	841	686	296	400
5.....	33	117	119	138	206	22	329	684	746	629	336	400
6.....	38	119	113	140	180	17	310	717	686	574	378	400
7.....	38	150	110	138	111	14	290	751	657	495	400	400
8.....	38	125	106	138	102	12	272	756	686	446	400	400
9.....	38	58	104	125	102	11	254	824	777	423	400	400
10.....	36	0	100	104	102	9	254	963	978	423	400	400
11.....	34	30	95	72	110	8	254	1,040	1,190	315	400	400
12.....	34	52	89	9	130	7	254	1,050	1,340	226	400	400
13.....	32	52	79	5	136	6	310	1,120	1,480	226	400	400
14.....	32	63	72	4	150	7	371	1,120	1,480	226	400	400
15.....	30	72	68	3	152	7	438	978	1,480	226	400	400
16.....	30	74	62	3	164	8	484	908	1,260	226	400	400
17.....	30	74	60	3	206	11	508	908	1,120	226	400	400
18.....	30	77	80	6	206	15	508	908	978	242	400	400
19.....	28	100	93	47	206	17	484	978	908	277	400	400
20.....	28	125	106	52	172	16	438	1,050	908	277	400	400
21.....	28	138	3	66	106	15	393	978	1,050	260	400	400
22.....	37	145	3	98	100	15	371	908	1,190	242	400	356
23.....	44	154	3	108	100	15	350	777	1,190	242	400	336
24.....	46	159	2	136	100	15	310	716	1,120	242	400	336
25.....	48	159	2	140	102	15	290	657	978	242	400	315
26.....	50	157	2	140	86	15	310	574	908	242	400	315
27.....	56	169	2	138	36	15	329	521	908	242	400	315
28.....	66	172	2	138	39	15	350	521	908	242	400	296
29.....	89	169	95	138	40	15	415	547	908	242	400	277
30.....	98	164	53	140	-----	15	461	657	669	242	400	242
31.....	102	-----	53	140	-----	14	-----	716	-----	242	400	-----

Month	Observed				Gain or loss in storage in Bumping Lake (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre- feet		Run-off in acre- feet	Discharge in second-feet		Run-off in inches
	Maxi- mum	Mini- mum	Mean				Mean	Per square mile	
October .....	102	28	42.5	2,610	+357	2,970	48.3	0.710	0.82
November .....	172	0	112	6,670	+1,560	8,230	138	2.03	2.26
December .....	162	2	72.4	4,450	+1,280	5,730	93.2	1.37	1.58
January .....	140	3	89.0	5,470	+2,430	7,900	128	1.88	2.17
February .....	206	36	135	7,770	+5,010	12,800	223	3.28	3.54
March .....	33	6	14.7	904	+19,700	20,600	335	4.93	5.68
April .....	508	17	329	19,600	+2,100	21,700	365	5.37	5.99
May .....	1,120	521	800	49,200	+346	49,500	805	11.8	13.60
June .....	1,480	657	988	58,800	+319	59,100	993	14.6	16.29
July .....	686	226	341	20,900	+1,940	22,800	371	5.46	6.30
August .....	400	242	379	23,300	-16,000	7,300	119	1.75	2.02
September .....	400	242	373	22,200	-16,900	5,300	89.1	1.31	1.46
The year .....	1,480	0	306	222,000	+2,140	224,000	308	4.53	61.71

## TIETON RIVER AT TIETON DAM, NEAR NACHES, WASH.

LOCATION.—Water-stage recorder 100 feet above Wild Cat Creek, 2,000 feet below Tieton Dam, and 22 miles southwest of Naches.

DRAINAGE AREA.—187 square miles.

RECORDS AVAILABLE.—August 1908 to September 1914 (fragmentary), October 1918 to March 1919, April 1925 to September 1932.

EXTREMES.—Maximum discharge during year, 3,220 second-feet July 6 (gage height, 7.01 feet); minimum, 1 second-foot Apr. 8, 9.

1908-14, 1918-19, 1925-32: Maximum discharge, 4,380 second-feet June 1, 1928 (gage height, 7.8 feet); no flow Apr. 4-6, 10, 1930.

Gage height, 9.5 feet (present datum) Dec. 18, 19, 1917 (discharge, 8,400 second-feet), reported by Bureau of Reclamation engineers.

REMARKS.—Records excellent except those for extremely low stages. No diversions. Flow regulated at Tieton Reservoir. 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	154	89	5	4	12	13	6	123	227	1,090	892	625
2	165	116	5	4	11	9	7	138	230	1,020	861	620
3	170	54	5	4	11	5	5	144	232	1,020	892	625
4	165	3	5	4	11	5	3	146	232	989	892	547
5	163	3	5	4	11	11	2	142	232	861	892	517
6	167	36	5	4	11	10	2	142	232	793	892	456
7	170	43	5	5	11	7	2	132	238	757	892	479
8	152	4	4	5	11	5	1	142	241	799	830	517
9	134	4	4	6	11	3	1	146	244	892	763	522
10	127	4	4	6	11	3	2	138	249	989	722	625
11	119	4	4	17	11	2	3	140	249	1,020	609	745
12	111	4	4	30	11	2	6	144	249	989	547	830
13	111	4	4	25	11	2	11	146	252	989	517	763
14	125	4	4	19	11	2	16	154	332	989	493	716
15	127	4	4	17	11	2	12	170	625	989	465	739
16	121	4	4	17	11	2	10	181	1,230	989	456	769
17	121	4	4	16	12	5	7	191	1,190	989	547	781
18	121	4	5	16	12	20	6	193	1,190	1,020	681	769
19	119	4	5	15	11	18	5	196	1,090	1,120	757	722
20	118	5	5	14	11	11	5	203	1,120	1,190	722	572
21	118	65	5	13	11	8	26	203	1,230	1,230	687	451
22	118	84	5	13	11	5	32	216	1,300	1,190	598	451
23	118	84	5	13	11	4	40	227	1,410	1,190	522	451
24	119	84	5	13	13	4	59	224	1,260	1,160	552	451
25	121	84	4	13	19	3	82	227	1,120	1,060	681	488
26	123	84	4	12	54	2	106	230	1,060	1,020	704	537
27	123	84	4	12	49	2	130	235	1,020	989	670	542
28	123	60	4	12	33	3	134	235	1,090	892	716	542
29	132	47	4	12	21	3	130	235	1,120	892	733	542
30	83	42	4	12	-----	4	123	232	1,060	892	659	474
31	34	-----	4	12	-----	4	-----	227	-----	892	625	-----

Month	Observed				Gain or loss in storage in Tieton Reservoir (acre-feet)	Corrected for storage			
	Discharge in second-feet			Run-off in acre-feet		Run-off in acre-feet	Discharge in second-feet		Run-off in inches
	Maximum	Minimum	Mean				Mean	Per square mile	
October	170	34	128	7,880	+1,860	9,740	158	0.845	0.97
November	116	3	37.2	2,210	+6,840	9,050	152	.813	.91
December	5	4	4.45	274	+9,570	9,840	160	.856	.99
January	30	4	11.9	732	+12,100	12,800	208	1.11	1.28
February	54	11	15.3	883	+17,600	18,500	322	1.72	1.86
March	20	2	5.77	355	+36,000	36,400	592	3.17	3.66
April	134	1	32.5	1,930	+34,100	36,000	605	3.24	3.62
May	235	123	181	11,100	+53,300	64,400	1,050	5.61	6.47
June	1,410	227	718	42,800	+28,400	71,200	1,200	6.42	7.16
July	1,230	757	997	61,300	-22,800	38,500	626	3.25	3.86
August	892	517	692	42,500	-23,300	19,200	312	1.67	1.92
September	830	451	596	35,400	-23,500	11,900	200	1.07	1.19
The year	1,410	1	286	207,000	+130,000	338,000	465	2.49	33.89



## TIETON RIVER AT HEADWORKS OF TIETON CANAL, NEAR NACHES, WASH.

LOCATION.—Water-stage recorder in sec. 30, T. 14 N., R. 15 E. (unsurveyed), below intake of Tieton Canal and 16 miles southwest of Naches.

DRAINAGE AREA.—240 square miles.

RECORDS AVAILABLE.—April to September 1906 (fragmentary gage-height records); July 1907 to September 1932.

EXTREMES.—Maximum discharge during year, 2,430 second-feet July 6 (gage height, 5.50 feet); no flow Nov. 20, 21, Apr. 23.

1907-32: Maximum discharge, 6,150 second-feet Dec. 13, 1921 (gage height, 8.15 feet); no flow occasionally during 1926, 1929, 1931, 1932.

REMARKS.—Records good except those for Nov. 21-24, 27-30, Dec. 20 to Jan. 16, which were estimated, and those for periods of extremely low flow. Diversions by Tieton Canal included in monthly discharge table. Flow regulated by Tieton Reservoir, 7 miles above gage. 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	158	125	21	9	18	105	96	7	5	800	596	346
2	166	140	16	9	18	90	96	7	13	778	560	336
3	172	88	15	9	18	60	90	10	18	800	590	350
4	169	10	15	9	18	47	80	13	16	734	614	277
5	162	9	14	9	18	112	74	7	8	578	620	253
6	158	8	12	9	18	108	58	26	3	527	614	183
7	180	51	10	10	18	77	47	12	2	461	602	172
8	169	24	9	10	18	77	43	34	7	478	549	229
9	146	16	9	11	18	64	38	38	9	500	483	229
10	131	14	9	11	16	60	47	26	15	692	430	310
11	120	14	9	22	15	56	58	9	18	720	336	450
12	100	16	9	35	15	47	69	21	21	706	257	584
13	100	14	9	30	15	48	86	24	20	692	233	500
14	125	10	9	24	15	47	96	7	22	692	204	440
15	120	14	9	20	15	48	80	7	155	692	176	472
16	118	18	9	19	15	53	69	15	870	699	143	516
17	118	17	9	18	15	105	64	18	886	706	253	516
18	118	13	9	18	16	233	56	14	846	734	420	510
19	118	13	9	18	18	211	49	7	785	846	488	494
20	115	2	9	18	21	149	12	11	838	926	461	365
21	115	5	9	18	18	120	12	5	974	974	405	197
22	122	7	9	18	15	105	1	4	1,080	934	328	197
23	128	10	9	18	15	100	0	13	1,230	918	225	208
24	134	12	9	18	26	110	1	6	1,060	870	200	214
25	134	15	8	18	96	110	4	3	846	755	380	265
26	137	4	8	18	505	92	9	9	792	720	410	323
27	137	7	8	18	285	92	9	7	755	720	385	350
28	143	10	8	18	214	91	18	7	822	620	425	355
29	146	14	8	18	146	90	15	15	862	620	450	360
30	118	18	8	18	90	90	9	15	792	614	395	400
31	15	8	8	18	96	96	3	3	614	614	350	-----

Month	Observed				Gain or loss in storage in Tieton Reservoir (acre-feet)	Diverted by Tieton Canal (acre-feet)	Corrected for storage and diversions			
	Discharge in second-feet			Run-off in acre-feet			Run-off in acre-feet	Discharge in second-feet		Run-off in inches
	Maximum	Minimum	Mean					Mean	Per square mile	
October	180	15	132	8,120	+1,860		9,980	162	0.675	0.78
November	140	2	23.9	1,420	+6,840	1,320	9,580	161	.671	.75
December	21	8	10.1	619	+9,570	26	10,200	166	.692	.80
January	35	9	16.6	1,020	+12,100		13,100	213	.888	1.02
February	505	15	57.2	3,290	+17,600		20,900	363	1.51	1.63
March	233	47	93.3	5,740	+36,000	216	42,000	683	2.85	3.29
April	96	0	46.2	2,570	+34,100	4,300	41,000	689	2.87	3.20
May	38	3	12.9	793	+53,300	15,700	69,800	1,140	4.75	5.48
June	1,230	2	459	27,300	+28,400	17,300	73,000	1,230	5.13	5.72
July	974	461	716	44,100	+22,800	19,100	40,400	657	2.74	3.16
August	620	143	406	25,000	-23,300	19,100	20,800	338	1.41	1.63
September	584	172	347	20,600	-23,500	16,200	13,300	224	.933	1.04
The year	1,230	0	194	141,000	+130,000	93,300	364,000	502	2.09	28.50

## NORTH FORK OF AHTANUM CREEK NEAR TAMPICO, WASH.

LOCATION.—Water-stage recorder in NW¼ sec. 2, T. 12 N., R. 15 E., 100 feet below Nasty Creek and 3½ miles northwest of Tampico.

DRAINAGE AREA.—69 square miles.

RECORDS AVAILABLE.—August 1907 to September 1924, March 1931 to September 1932.

EXTREMES.—Maximum discharge during period Mar. 1, 1931, to Sept. 30, 1932, 255 second-feet May 9 and 12, 1932 (gage height, 3.16 feet); minimum, 5.9 second-feet Nov. 22 (gage height, 1.55 feet).

1907-24, 1931-32: Maximum discharge, 728 second-feet June 18, 1916 (gage height, 4.6 feet); minimum, that of Nov. 22, 1931.

REMARKS.—Records good. No diversions of importance. No regulation. Gage-height record and most of discharge measurements furnished by United States Office of Indian Affairs.

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

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1931							
1.....	14	54	187	49	20	12	9.0
2.....	14	50	214	46	20	11	9.0
3.....	16	42	209	44	20	11	9.0
4.....	14	42	199	42	20	11	8.6
5.....	13	42	194	41	19	12	8.6
6.....	11	43	197	39	22	12	9.4
7.....	9.0	41	160	37	20	12	10
8.....	9.0	38	131	36	20	12	10
9.....	9.0	38	124	36	20	11	10
10.....	9.0	39	126	34	19	11	10
11.....	9.0	39	137	34	18	11	10
12.....	9.0	39	151	33	18	11	10
13.....	8.6	37	158	34	18	11	9.8
14.....	8.6	36	169	40	17	10	9.8
15.....	8.6	36	151	61	17	10	9.4
16.....	12	42	131	61	17	9.8	9.4
17.....	12	41	109	44	16	9.8	9.4
18.....	11	40	92	39	15	10	12
19.....	12	39	79	36	14	9.8	11
20.....	12	39	70	35	14	9.8	10
21.....	12	40	65	34	14	9.8	9.8
22.....	12	44	63	33	14	9.8	9.4
23.....	12	58	65	32	14	9.4	9.8
24.....	12	57	66	32	13	9.4	9.4
25.....	12	79	68	31	13	9.4	9.4
26.....	12	99	63	34	13	9.4	9.4
27.....	12	131	59	32	13	9.8	9.0
28.....	11	153	57	31	13	9.8	9.4
29.....	12	171	55	30	13	9.0	7.4
30.....	14	176	53	29	13	9.0	9.4
31.....	18	-----	51	-----	12	9.0	-----

*Discharge, in second-feet, of North Fork of Ahtanum Creek near Timpico, Wash.,  
1931-32—Continued*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1	9.8	15	16	13	12	78	95	169	162	76	28	17
2	9.4	16	15	12	12	63	105	169	178	73	26	17
3	9.8	14	15	12	12	54	99	169	187	70	25	17
4	9.8	14	14	12	12	50	84	178	190	65	25	17
5	10	14	13	12	12	52	76	194	171	62	24	17
6	11	14	13	12	11	53	68	199	160	57	23	17
7	10	18	13	13	11	50	66	209	160	55	22	17
8	11	17	13	13	11	47	62	206	169	54	22	16
9	11	15	12	13	11	43	61	218	178	52	22	16
10	11	14	12	13	11	41	64	240	197	52	24	16
11	11	12	12	27	11	39	75	226	202	50	24	15
12	11	13	11	35	11	34	92	233	206	49	23	16
13	11	14	12	12	11	36	118	235	202	47	23	15
14	11	13	12	17	9.4	37	131	226	197	46	22	15
15	11	12	12	22	12	38	124	206	190	45	22	14
16	10	12	13	20	12	40	120	204	174	43	21	14
17	11	12	13	18	11	55	114	209	155	41	19	14
18	11	12	16	18	12	107	103	216	146	39	19	14
19	11	13	18	16	12	131	97	214	139	37	19	15
20	10	12	17	14	12	103	88	216	139	37	19	15
21	11	9.0	14	14	12	88	79	197	137	35	22	15
22	13	6.0	13	12	12	81	73	180	142	34	22	14
23	13	7.4	13	9.8	12	73	69	169	126	33	21	14
24	12	11	13	13	14	76	66	162	116	33	19	14
25	12	11	13	15	22	73	68	153	107	32	18	14
26	12	13	12	14	65	65	82	144	101	32	19	14
27	12	9.0	13	13	183	62	107	137	97	32	19	14
28	16	8.6	13	13	137	65	135	131	92	32	17	13
29	20	13	12	13	101	64	148	135	86	31	17	13
30	17	17	12	12	65	160	142	81	31	17	13	
31	16		13	12	73			153		29	18	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931				
March	18	8.6	11.6	713
April	176	36	60.8	3,620
May	214	51	118	7,260
June	61	29	38.0	2,280
July	28	12	17.3	1,060
August	12	9.0	10.4	640
September	12	7.4	9.56	569
The period				16,100
1931-32				
October	20	9.4	11.8	726
November	18	6.0	12.7	756
December	18	11	13.3	818
January	35	9.8	15.0	922
February	183	9.4	27.1	1,560
March	131	34	62.5	3,840
April	160	61	94.3	5,610
May	240	131	139	11,600
June	206	81	153	9,100
July	76	29	45.3	2,790
August	28	17	21.3	1,310
September	17	13	15.1	898
The year	240	6.0	55.0	39,900

## SOUTH FORK OF AHTANUM CREEK AT CONRAD RANCH, NEAR TAMPICO, WASH.

LOCATION.—Staff gage in W½ sec. 23, T. 12 N., R. 15 E., at Conrad ranch, 2½ miles above North Fork and 2¼ miles southwest of Tampico.

DRAINAGE AREA.—26 square miles.

RECORDS AVAILABLE.—March 1915 to September 1924, March 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 128 second-feet Feb. 26 (gage height, 1.60 feet); minimum occurred during winter.

1915-24, 1931-32: Maximum discharge, 216 second-feet June 19, 1916 (gage height, 3.1 feet); minimum, 2.6 second-feet Aug. 23, 25, 1931.

REMARKS.—Records good except those estimated for Nov. 23 to Dec. 3, and those estimated because of ice, Dec. 14-20, Jan. 28 to Feb. 7. Small irrigation diversion above gage. Gage-height record and most of discharge measurements furnished by United States Office of Indian Affairs.

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	5.4		4.8		37	27	34	37	17	9.7	6.9
2	3.9	5.4	3.0	5.4		32	30	36	39	16	9.3	6.9
3	3.9	4.8		4.8		22	27	36	42	17	8.9	6.6
4	3.9	4.8	5.1	4.8	4.0	21	26	36	43	17	8.5	6.6
5	3.9	4.8	4.2	4.2		20	23	40	42	17	8.5	6.6
6	4.2	4.8	4.2	4.2		21	22	42	38	17	8.1	6.3
7	4.2	5.4	4.2	4.8		21	19	45	37	14	8.1	6.3
8	4.2	5.4	4.8	4.8	4.8	18	18	47	36	14	8.1	6.6
9	4.2	5.4	4.2	4.8	4.8	15	18	52	37	14	8.1	6.3
10	4.2	5.4	4.8	4.8	4.5	16	18	54	37	14	8.9	6.3
11	4.2	4.8	4.2	11	4.2	15	20	54	39	14	8.9	6.3
12	4.2	4.8	3.3	11	4.2	12	22	56	38	14	8.9	6.3
13	4.2	4.8	4.5	6.9	4.2	12	27	58	38	13	8.1	6.3
14	4.2	4.8		6.6	4.2	12	30	56	38	13	8.1	6.0
15	4.2	4.2		5.4	4.8	12	28	53	36	13	8.1	6.0
16	4.2	4.2		5.4	4.8	14	28	53	34	13	7.7	6.0
17	4.2	4.2	3.0	5.7	4.2	22	28	52	32	12	7.7	6.0
18	4.2	4.2		5.4	4.2	36	26	54	32	12	7.7	6.0
19	4.2	4.8		5.4	4.2	52	25	53	30	11	7.3	6.0
20	4.2	4.8		5.4	4.8	37	22	57	29	9.3	7.3	6.3
21	4.2	3.9	5.4	5.4	4.2	35	21	52	27	11	7.7	6.0
22	4.8	3.6	5.4	5.7	4.8	30	19	49	26	9.7	8.1	6.0
23	4.8		4.8	3.9	4.8	27	18	45	24	9.7	8.1	6.0
24	4.8		5.4	3.6	5.4	27	18	44	24	9.7	7.3	6.0
25	4.8		4.8	4.2	8.9	30	17	43	22	9.7	7.3	6.0
26	4.8	3.3	4.8	3.9	78	25	19	40	22	9.7	7.3	6.0
27	4.8		4.8	4.5	90	22	23	39	20	9.7	7.3	6.6
28	5.7		4.8		67	24	27	37	19	9.7	6.9	6.6
29	5.7		4.8		45	23	30	36	18	9.7	6.6	6.6
30	5.7		4.8	4.0		22	32	37	17	9.7	7.3	6.0
31	5.1		4.8			24		37		9.3	7.3	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5.7	3.9	4.44	273
November	5.4		4.37	260
December	5.4		4.13	254
January	11		5.25	323
February	90		13.6	782
March	52	12	23.7	1,460
April	32	17	23.6	1,400
May	58	34	46.0	2,830
June	43	17	31.8	1,890
July	17	9.3	12.5	769
August	9.7	6.6	7.97	490
September	6.9	6.0	6.28	374
The year	90		15.3	11,100

## 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 other points as shown by the following table:

*Miscellaneous discharge measurements in Pacific slope basins in Washington and upper Columbia River Basin during the year ending Sept. 30, 1932*<sup>6</sup>

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Dis-charge
				<i>Feet</i>	<i>Sec.-ft.</i>
Sept. 16	Queets River	Pacific Ocean	400 feet above Tshletshy Creek near Clearwater, Wash.		284
Aug. 25	do.	do.	Killea ranger station near Clearwater, Wash.	2.48	677
Sept. 12	do.	do.	do.	2.17	435
July 21	Hee Hee Creek	Queets River	Mouth, near Clearwater, Wash.		85.9
22	do.	do.	do.		73.5
18	Pelton Creek	do.	½ mile above mouth, near Clearwater, Wash.		53.0
12	Tshletshy Creek	do.	2,000 feet above mouth, near Clearwater, Wash.		135
Sept. 16	do.	do.	500 feet above mouth, near Clearwater, Wash.		37.2
Aug. 25	Sams Creek	do.	1,000 feet above mouth, near Clearwater, Wash.		59.0
Sept. 15	do.	do.	do.		36.1
Aug. 26	Matheny Creek	do.	800 feet above mouth, near Clearwater, Wash.		66.2
Sept. 12	do.	do.	100 feet above mouth, near Clearwater, Wash.		48.4
3	Salmon River	do.	½ mile above mouth, near Clearwater, Wash.		37.7
15	do.	do.	do.		26.3
Jan. 30	Hurst Creek	Clearwater River	300 feet above road crossing at Clearwater, Wash.		37.9
Oct. 7	South Fork of Skokomish River.	Skokomish River	Former gaging station near Potlatch, Wash.	2.49	303
Dec. 1	do.	do.	do.	2.38	293
June 2	do.	do.	do.	2.89	411
July 12	do.	do.	do.	2.32	260
Aug. 25	do.	do.	do.	1.46	126
Dec. 9	North Fork of Wallace River.	Wallace River	1½ miles below Wallace Lake, near Gold Bar, Wash.		11.1
Nov. 4	Skagit River	Skagit Bay	Former gaging station below Ruby Creek, near Marblemount, Wash.	4.75	1,750
Oct. 16*	do.	do.	Former gaging station at Reflector Bar, near Marblemount, Wash.	1.70	2,090
Apr. 7*	do.	do.	Ferry Bar, 5 miles above Newhalem, Wash.	10.00	3,700
June 17*	do.	do.	do.	15.28	12,400
July 17*	do.	do.	do.	11.42	5,390
Oct. 17*	Stetattle Creek	Skagit River	300 feet above bridge at mouth, near Newhalem, Wash.		36.1
Dec. 4*	do.	do.	35 feet above dam, ¼ mile above mouth, near Newhalem, Wash.		42.8
Apr. 8*	do.	do.	Trail bridge at mouth, near Newhalem, Wash.	1.90	109
June 12*	do.	do.	do.	2.50	567
July 11*	do.	do.	do.	1.02	264
July 15	Kootenai River	Columbia River	Proctor Narrows, on west arm of Kootenai Lake at Gage 21 of the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada, ¼ mile below mouth of Laird Creek and 2 miles west of Proctor, British Columbia.	50.41	58,400

\* Furnished by city of Seattle.

<sup>6</sup> Table also includes measurements for 1930 and 1931 for Boundary Creek (p. 178) and Little Spokane River (p. 178).

*Miscellaneous discharge measurements in Pacific slope basins in Washington and upper Columbia River Basin during the year ending Sept. 30, 1932—Contd.*

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				<i>Feet</i>	<i>Sec.-ft.</i>
May 14	Kootenai River.....	Columbia River.....	Grohman Narrows, 2 miles below Nelson, British Columbia. Measurements referred to Gage 10 at Nelson. Gage is station 8NJ9 of the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.	6.43	33,700
19	do.....	do.....	do.....	12.42	77,300
28	do.....	do.....	do.....	13.88	90,200
June 7	do.....	do.....	do.....	14.03	89,300
11	do.....	do.....	do.....	14.48	92,700
16	do.....	do.....	do.....	15.69	105,000
18	do.....	do.....	do.....	16.11	108,000
21	do.....	do.....	do.....	16.11	111,000
25	do.....	do.....	do.....	15.88	104,000
28	do.....	do.....	do.....	15.51	101,000
July 2	do.....	do.....	do.....	14.71	92,900
5	do.....	do.....	do.....	13.98	88,100
8	do.....	do.....	do.....	12.98	78,300
9	do.....	do.....	do.....	12.68	77,500
12	do.....	do.....	Grohman Narrows, 2 miles below Nelson, British Columbia. Measurements referred to Gage 10 at Nelson. Gage is station 8 NJ9 of the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.	11.53	69,100
Aug. 19	do.....	do.....	do.....	4.92	25,900
Sept. 20	do.....	do.....	do.....	2.81	14,900
May 5	do.....	do.....	Glade, British Columbia (station of Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada).	8.66	42,900
18	do.....	do.....	do.....	13.61	85,200
30	do.....	do.....	do.....	14.46	91,200
June 9	do.....	do.....	do.....	15.42	102,000
17	do.....	do.....	do.....	16.97	121,000
29	do.....	do.....	do.....	16.18	108,000
July 7	do.....	do.....	do.....	13.93	85,800
13	do.....	do.....	do.....	12.22	70,600
Aug. 18	do.....	do.....	do.....	6.52	28,100
Sept. 21	do.....	do.....	do.....	4.09	16,300
Oct. 2	Deep Creek.....	Kootenai River.....	In NW $\frac{1}{4}$ sec. 30, T. 62 N., R. 1 E., 3,000 feet from mouth and 3 $\frac{1}{2}$ miles north west of Bonners Ferry, Idaho.		21.4
Feb. 10	do.....	do.....	In SE $\frac{1}{4}$ sec. 19, T. 62 N., R. 1 E., 500 feet from mouth, 30 feet below drainage district no. 1 drain outlet, and 3 $\frac{1}{2}$ miles west of Bonners Ferry, Idaho.		56.8
10	do.....	do.....	In NE $\frac{1}{4}$ sec. 36, T. 62 N., R. 1 W., 100 feet above old mouth of Fish Creek slough and 4 $\frac{1}{2}$ miles southwest of Bonners Ferry, Idaho.		51.2
Oct. 2	Snow Creek.....	Deep Creek.....	In SE $\frac{1}{4}$ sec. 1, T. 61 N., R. 1 W., 300 feet below mouth of Caribou Creek and 4 $\frac{1}{2}$ miles southwest of Bonners Ferry, Idaho.		2.02
2	Myrtle Creek.....	Kootenai River.....	In NW $\frac{1}{4}$ sec. 24, T. 62 N., R. 1 W., 2,200 feet south of section line and 5 miles north west of Bonners Ferry, Idaho.		3.69
Feb. 11	do.....	do.....	In SW $\frac{1}{4}$ sec. 12, T. 62 N., R. 1 W., 200 feet above mouth and 5 $\frac{1}{2}$ miles north west of Bonners Ferry, Idaho.		8.15

*Miscellaneous discharge measurements in Pacific slope basins in Washington and upper Columbia River Basin during the year ending Sept. 30, 1932—Continued*

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				<i>Feet</i>	<i>Sec.-ft.</i>
Oct. 3	Unnamed Creek	Ball Creek	In NW¼ sec. 25, T. 63 N., R. 1 W., 700 feet above mouth of Ball Creek and 8 miles northwest of Bonners Ferry, Idaho.		1.43
Feb. 23	do.	do.	do.		1.34
Oct. 3	Ball Creek	Kootenai River	In NW¼ sec. 25, T. 63 N., R. 1 W., 500 feet above mouth and 8 miles northwest of Bonners Ferry, Idaho.		1.88
Feb. 23	do.	do.	do.		2.04
Oct. 2	Mission Creek	do.	In SE¼ sec. 12, T. 64 N., R. 1 W., 400 feet above mouth and ½ mile northwest of Copeland, Idaho.		2.63
Feb. 9	do.	do.	do.		3.53
Oct. 2	Parker Creek	do.	In SW¼ sec. 4, T. 64 N., R. 1 W., 100 feet above mouth and 4½ miles northwest of Copeland, Idaho.		1.15
May 4	Slocan River	do.	Near Crescent Valley, British Columbia (station of Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada).	7.29	5,890
29	Sullivan Creek	Clark Fork	¼ mile above mouth, at Met-aline Falls, Wash.		753
June 9	do.	do.	do.		762
25	do.	do.	do.		448
July 1	do.	do.	do.		363
7	do.	do.	do.		187
Aug. 25	do.	do.	do.		61.4
July 27 <sup>b</sup>	Sheep Creek	Columbia River	Canadian gaging station near Rossland, British Columbia.	1.14	29.1
Sept. 11 <sup>b</sup>	do.	do.	do.	.92	16.0
May 12	Christina Creek	Kettle River	Highway crossing near Cascade, British Columbia.		1,190
30	do.	do.	do.	3.40	752
June 18	do.	do.	do.	2.00	472
28 <sup>b</sup>	do.	do.	do.	1.26	335
30	do.	do.	do.	1.11	276
July 28 <sup>b</sup>	do.	do.	do.	-.03	80
1930					
Oct. 27	Boundary Creek	do.	Canadian gaging station near Midway, British Columbia.	.86	7.2
1931					
Mar. 6	do.	do.	do.	.90	11.5
June 5	do.	do.	do.	1.76	125
23	do.	do.	do.	1.89	165
July 18	do.	do.	do.	1.29	34.2
1932					
Jan. 11	do.	do.	do.	.83	9.1
May 31	do.	do.	do.	2.62	334
June 16	do.	do.	do.	2.66	363
29	do.	do.	do.	1.85	126
Jan. 28	Spokane River	Columbia River	Liberty Bridge, near Spokane, Wash.	2,009.95	1,490
Sept. 12	do.	do.	do.	2,009.18	802
1931					
Jan. 6 <sup>c</sup>	Little Spokane River	Spokane River	½ mile above mouth, near Spokane, Wash.		347
Mar. 5 <sup>c</sup>	do.	do.	do.		434
May 1 <sup>c</sup>	do.	do.	do.		396
July 29 <sup>c</sup>	do.	do.	do.		304
Aug. 29 <sup>c</sup>	do.	do.	do.		314
Oct. 30 <sup>c</sup>	do.	do.	do.		325

<sup>b</sup> Furnished by Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

<sup>c</sup> Furnished by Washington Water Power Co.

*Miscellaneous discharge measurements in Pacific slope basins in Washington and upper Columbia River Basin during the year ending Sept. 30, 1932—Continued*

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Dis-charge
1932				<i>Feet</i>	<i>Sec.-ft.</i>
Jan. 6	Little Spokane River	Spokane River	1,000 feet above mouth, near Spokane, Wash.		377
Sept. 19	Sinlahekin Creek	Palmer Lake	1,000 feet above Palmer Lake, near Nighthawk, Wash.		2.0
June 14	Palmer Creek	Similkameen River	Highway crossing near Nighthawk, Wash.	3.76	<sup>d</sup> 588
June 24	do	do	do	1.32	<sup>e</sup> 347
Sept. 19	do	do	1,000 feet below Palmer Lake, near Nighthawk, Wash.		<sup>e</sup> 5.0
May 17	Wenatchee River	Columbia River	Bridge at outlet of Lake Wenatchee near Telma, Wash.	3.70	3,390
30	do	do	do	3.00	2,400
June 13	do	do	do	5.32	5,450
May 18	Nason Creek	Wenatchee River	Highway crossing in sec. 33, T. 27 N., R. 17 E., near Merit, Wash.		1,090
30	do	do	do		835
18	Chiwawa River	do	Highway crossing near Plain, Wash.		1,870
28	do	do	do		1,130
Apr. 21	Union Gap Canal	Left side of Yakima River	1 mile above Inland Empire Highway crossing of Yakima River near Union Gap, Wash.		32.8
June 21	do	do	do		42.8
Apr. 19	New Reservation Canal	Right side of Yakima River	Former gaging station at Parker, Wash.	9.16	1,530
June 18	do	do	do	9.66	1,680
Apr. 19	Old Reservation Canal	do	do	2.13	96.1
June 24	do	do	do	2.75	156
Apr. 20	Sunnyside Canal	Left side of Yakima River	Former gaging station near Parker, Wash.	4.75	1,080
June 21	do	do	do	5.30	1,290
Apr. 21	Toppenish Creek	Yakima River	Below feeder canal diversion dam near Fort Simcoe, Wash.	1.10	227
16	do	do	Just above crossing of main line of Northern Pacific Ry. near Satus, Wash.	2.70	166
June 22	do	do	do	2.34	104
Apr. 21	Toppenish Feeder Canal	Left side of Toppenish Creek	Former gaging station at intake near Fort Simcoe, Wash.	2.76	15.2
13	Reservation Drain	Yakima River	$\frac{3}{4}$ mile above former gaging station at Alfalfa, Wash.	3.11	298
June 23	do	do	At crossing of main line of Northern Pacific Ry. at Alfalfa, Wash.	4.36	415
Apr. 12	Satus Creek	do	Former gaging station below Dry Creek near Toppenish, Wash.	2.42	167
14	do	do	$\frac{3}{4}$ mile below crossing of main line of Northern Pacific Ry. at Satus, Wash.	2.12	167
June 22	do	do	do	1.41	49.4

<sup>a</sup> Furnished by Washington Water Power Co.

<sup>d</sup> Water flowing into Palmer Lake.

<sup>e</sup> Water flowing out of Palmer Lake.





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