Quantity and Quality of Surface Waters of Alaska, 1958

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1570

Quantity and Quality of Surface Waters of Alaska, 1958

Prepared under the direction of J. V. B. WELLS, *Chief, Surface Water Branch,* S. K. LOVE, *Chief, Quality of Water Branch*

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1570

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1960

UNITED STATES DEPARTMENT OF THE INTERIOR

FRED A. SEATON, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 50 cents (paper cover)

PREFACE

This report was prepared by the Geological Survey in the Water Resources Division, L. B. Leopold, chief. The streamflow records were prepared under the general direction of J. V. B. Wells, chief, Surface Water Branch, and F. J. Flynn, chief, Basic Records Section, the data being collected and computed under the supervision of R. E. Marsh, district engineer, Surface Water Branch, Juneau, Alaska. The quality of water records were prepared under the general direction of S. K. Love, chief, Quality of Water Branch, and W. H. Durum, chief, Reports Section, the data being collected and computed under supervision of F. B. Walling, district chemist, Quality of Water Branch, Palmer, Alaska.

CALENDAR FOR WATER YEAR 1958

OCTOBER 1957

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

NOVEMBER 1957

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

DECEMBER 1957

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

JANUARY 1958

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

FEBRUARY 1958

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

MARCH 1958

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

APRIL 1958

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

MAY 1958

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

JUNE 1958

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

JULY 1958

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

AUGUST 1958

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

SEPTEMBER 1958

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

CONTENTS

QUANTITY AND QUALITY OF SURFACE WATERS OF ALASKA, 1958

SCOPE OF WORK

This volume contains results of measurements of the flow and the chemical and physical quality of streams in the Territory of Alaska during the water year ending September 30, 1958. Since the beginning of stream-gaging work in Alaska in 1906, records of flow of streams and ditches have been obtained at about 330 gaging stations for periods ranging from a few months to 40 years. On September 30, 1958, the Geological Survey was maintaining 68 gaging stations. Discharge measurements only were made at many other points in the 1958 water year; these are published near the end of the report.

Prior to 1948, records of chemical and physical composition of surface waters in Alaska consisted of a few turbidity measurements of the Copper River near Copper Center, in 1913, and chemical analyses of some surface waters of the Seward Peninsula, in 1914, of Yukon River basin, in 1915, and of the Yukon River at Anvik, 1915 to 1916. In 1948 a continuing chemical-quality program was started by the Geological Survey. Several miscellaneous samples were collected and analyzed that year, and regular sampling stations were established in 1949. During the 1958 water year records of chemical composition of surface waters were obtained at about 74 sites including 3 sites at which daily samples were collected during the open-water period. Sediment records were obtained at nine sites during the same period.

COOPERATION

Assistance in the form of funds or services was given by the Corps of Engineers, Department of Army, in collecting streamflow records published herein for five gaging stations.

Assistance was also furnished by the Bureau of Reclamation of the United States Department of the Interior in the operation of one gaging station.

The city of Seward financed the operation of one gaging station.

DIVISION OF WORK

The stream-gaging work was done by the Water Resources Division of the Geological Survey under the direction of the personnel shown in the preface. The streamflow data were collected and prepared for publication in the Surface Water Branch district office, the address of which is 111 Federal and Territorial Building, Juneau.

The collection of samples for chemical and suspended sediment analyses and water-temperature measurements was under the direction of personnel of Quality of Water Branch assisted by the Surface Water Branch. Chemical and sediment analyses, computation of data, and preparation of records was done by the Quality of Water district office, Palmer, Alaska.

Information of a more detailed nature than that published for most of the gaging stations or sampling stations given in this report is on file in the district offices shown above. Provisional records of discharge prior to publication and other unpublished data concerning the records may usually be obtained from the district offices.

DEFINITION OF TERMS AND ABBREVIATIONS

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied herein only to those gaging stations where a continuous record of discharge is obtained.

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

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

Runoff in inches (in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Acre-foot (ac-ft) is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, a long reach of the channel, or an artificial structure.

The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is so enclosed by a topographic divide that direct surface runoff from precipitation normally would drain by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

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

Part per million (ppm) is a unit weight of constituent in a million unit weights of solution. The unit has a slightly different meaning when applied to sediment concentrations. A part per million of sediment is computed as one million times the ratio of the weight of sediment to the weight of water-sediment mixture.

Hardness as $CaCO_3$ is the calcium and magnesium expressed as an equivalent amount of calcium carbonate.

Carbonate hardness is the hardness caused by calcium and magnesium equivalent to the carbonate and bicarbonate.

Noncarbonate hardness is the hardness caused by calcium and magnesium in excess of the carbonate hardness.

Particle-size analyses are expressed in percentages finer than indicated sizes in millimeters. The size classification used in this report is that recommended by the American Geophysical Union Subcommittee on sediment terminology.[1]

[1]Lane, E. W., et al., 1947, Report of the Subcommittee on Terminology: Am. Geophys. Union Trans., V. 28, p. 937.

Specific conductance (micromhos per centimeter at 25°C) is one million times the reciprocal of specific resistance, at 25°C. Specific resistance is the resistance in ohms of a column of water 1 cm long and 1 square cm in cross section.

Suspended sediment or suspended load is sediment that moves in suspension in water and is maintained in suspension by the upward components of turbulent currents or as a colloid. Daily sediment loads are expressed in tons per day, and except for subdivided days are usually obtained by multiplying daily mean sediment concentration in parts per million by the daily mean discharge, and the appropriate conversion factor, normally 0.0027.

pH is the negative logarithm of the hydrogen-ion concentration expressed in grams-moles per liter. However, when determined with a pH meter, which is the procedure normally used in Geological Survey laboratories, pH is an expression of the hydrogen-ion activity or the effective hydrogen-ion concentration.

DOWNSTREAM ORDER AND STATION NUMBERS

Gaging and sampling stations in this report are listed in a downstream direction along the main stem. All stations on a tributary entering above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging or sampling station is situated and the stream to which it is immediately tributary, each indention in the listing of stations in the table of contents of this report represents one rank. This downstream order and system of indention show which gaging or sampling stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each station is situated.

As an added means of identification, each gaging station and sampling station has been assigned a station number. The numbers have been assigned in the same downstream order used in this report. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive. In this report the station number is shown just to the left of the station name.

EXPLANATION OF DATA

SURFACE WATER

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. The records of stage are obtained either from direct readings on a nonrecording gage or from a water-stage recorder that gives a continuous record of fluctuations. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge.

Rating tables giving the discharge for any stage are prepared from stage-discharge-relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs, and by other methods), velocity-area studies, and

logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is essentially the shifting-control method.

At many gaging stations in Alaska the stage-discharge relation is affected by ice during the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and engineers, and comparable records of discharge for other stations in the same or nearby basins. If the stage-discharge relation is affected by ice, this information is given in a note to the table. No mention is made of occasional days of ice effect if the degree of accuracy of daily records is not changed.

The streamflow data presented herein comprise a description of the station and a table showing the daily discharge and the monthly and yearly discharge of the stream. Records are published on basis of the water year which begins on October 1 and ends on September 30.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, general remarks, and notations of revisions of the previously published record. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given the periods for which there are published records generally equivalent to those at the present site. Under "Gage" are given the type of gage currently in use and the datum of the present gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum discharge if there is little or no regulation; the minimum daily discharge if there is extensive regulation (also the minimum discharge if useful); and the minimum gage height (unless it is of no importance). In the first paragraph the data given are for the complete current year unless otherwise specified. In the second paragraph the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record is given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder, a crest-stage indicator, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge,

it is given separately. Information pertaining to the accuracy of the records and conditions which affect the natural flow at the gaging station is given under "Remarks."

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published in a subsequent report. In order to make it easier to find such revised records, a paragraph headed "Revisions (water years)" has been added to the description of all stations for which revised records have been published. In this paragraph are listed the reports in which revisions of daily discharge have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge are concerned in the revision, that fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. For stations in Alaska, however, monthly discharge for all stations prior to October 1950, were published in Water-Supply Paper 1372. Revisions of many monthly discharges as well as of previously published daily discharges were included in that report. The periods for which monthly discharge only is available and published in Water-Supply Paper 1372, are noted in the "Records available" paragraph. Therefore, the years for which revisions of monthly discharge only were made are not indicated under the "Revisions (water years)" paragraph. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the daily table gives the discharge corresponding to the daily mean gage height. For stations subject to such fluctuation the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day. For stations equipped with nonrecording gages, the table of daily discharge gives the discharge corresponding to once-daily readings of the gage, or to the mean of twice-daily readings, or to the mean gage height determined from gage-height graphs based on gage readings. For periods of rapidly changing stage, the daily mean discharge is determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Discharge for the month may be expressed in cubic feet per second per square mile (line headed "Cfsm"), or in inches (line headed "In."), or in acre-feet (line headed "Ac-ft"). Figures of cubic feet per second per square mile and runoff in inches are omitted if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights of most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man.

Footnotes to the table of daily discharge indicate periods when discharge was computed or estimated by unusual or special methods during periods of no gage-height record and ice effect, or by other effects that reduce the degree of accuracy of the records. Days on which discharge measurements were made are indicated by asterisk and footnote unless they were made at frequent regular intervals, in which instance the general frequency of discharge measurements is given under "Remarks" in the station description.

QUALITY OF WATER

In general, samples for chemical analysis were collected daily at five of the regular sampling stations during the open-water period, and periodically during the period of ice cover. For the daily stations analyses were made of 10-day composites of daily samples. Three composites were prepared each month by combining equal volumes of daily samples collected from the 1st to the 10th, from the 11th to the 20th, and for the remainder of the month. Samples were collected less frequently at many other stations in Alaska.

Samples collected for chemical analysis were analyzed according to methods regularly used by the Geological Survey. The methods are essentially the same as or are modifications of methods described in authoritative publications, for mineral analysis of water.[1, 2]

The values reported for dissolved solids are either calculated from determined constituents or are determined by evaporation of a clear sample of water to dryness and drying the residue for 1 hour at 180°C. Specific conductance is given for most of the analyses and was determined by means of a conductance bridge using a standard potassium chloride solution as reference.

The streamflow data are reported in two ways: For regular daily stations the daily mean discharge is reported, whereas values given for discharge in the tables of miscellaneous analyses are normally the discharge at the time the sample was collected.

Suspended-sediment samples were collected daily during the open-water season at four stations, and periodically at five stations. Samples were collected periodically during periods of ice cover at all stations. Daily samples were collected with a US D-49 depth-integrating sampler from a fixed point at one vertical in the cross section. Depth-integrated samples at three or more verticals in the cross section were collected periodically at all sediment stations. Occasionally point-integrated samples were taken with a US P-46 sampler.

Sediment concentrations were determined by weighing the solid residue after filtration or evaporation of the samples. For stations where samples were collected periodically,

[1] American Public Health Assoc., Standard methods for the examination of water and sewage, 10th ed. p. 1-217, 1955.

[2] Collins, W. D., Notes on practical water analysis; U. S. Geological Survey Water-Supply Paper 596-H, 1928.

the concentrations reported are instantaneous concentrations or concentration of composites of several samples. For regular daily stations, daily mean concentrations were obtained for the periods during which samples were taken by plotting the instantaneous concentration on a copy of the gage-height-recorder chart. The plotted concentrations were connected by a continuous curve. Daily mean concentrations were estimated from the graph. Footnotes to daily values in the tables are used to indicate methods of computation.

In addition to sediment concentrations and loads, records of particle size are reported also for most of the sediment stations. Generally particle size was determined by a combination of sieve analysis and bottom-withdrawal tube analysis (U. S. Inter-agency, 1943). Sizes larger than 0.062 mm (sand-size) were determined by sieve analysis and those smaller than 0.062 mm were determined by bottom-withdrawal tube or pipette analysis. Native or distilled water, as noted in the tables of analyses, was used as the settling medium. Usually distilled water with a dispersing agent was used. Results obtained with distilled water and a dispersing agent as a settling medium approximate the ultimate particle size of the finer fractions, whereas results obtained with native water as the settling medium more nearly simulate the particle size existing in the stream.

For most daily stations, water temperatures were obtained at the time the samples for chemical quality were collected. Where practicable, the water temperatures at a station were determined at about the same time each day in order to minimize diurnal variation of temperature. The thermometer used for temperature determinations was accurate to plus or minus 0.5°F.

The description of the station includes a statement giving the periods for which there are published records of water quality.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

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

The station description states the degree of accuracy of the discharge records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Figures of cubic feet per second per square mile and runoff in inches are published only for stations in southeastern Alaska; they are not published for stations in the rest of the Territory, because the annual precipitation is generally less than 20 inches. Discharge at some stations varies widely due to great differences in precipitation not only between sections of the Territory, but also at different elevations in the same areas. Generally speaking, annual precipitation is much greater in southeastern Alaska and along the coast to Seward than in the rest of the Territory. Even in southeastern Alaska annual precipitation may range from about 25 inches in the vicinity of Skagway in the northern part to about 150 inches near Ketchikan in the southern part, and may be as high as 180 inches at the southern tip of Baranof Island, all measured at or near sea level. However, precipitation increases with altitude, reaching a maximum at about 4,000 feet

elevation. Consequently, runoff in inches as measured at low elevations on streams draining mountainous areas often totals nearly twice the precipitation measured at or near sea level in the same drainage basin. At nearly every gaging station in southeastern Alaska the measured annual runoff in inches exceeds the annual precipitation as measured at the nearest Weather Bureau station.

PUBLICATIONS

A compilation of records of streamflow in Alaska through September 1950 has been published as WSP 1372. Records prior to 1946 were published in Geological Survey bulletins or water-supply papers or in reports of other agencies. Summary tables in WSP 1372 indicate the reports in which this data was originally published. In some cases the earlier reports contain more detailed information than is published in WSP 1372. That report contains a summary of monthly and annual discharges through September 1945 for all previously published records as well as records of daily and monthly discharge for the years 1946-50, which had not been published previously. All records prior to 1946 were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical.

Records of daily discharge and records of chemical quality, water temperatures, and suspended sediment from 1946 to date have been published in water-supply papers as shown in the following list. The data for any particular gaging station or sampling station will, in general, be found in the reports covering the years during which the station was maintained.

Water year	WSP
1946-50	1372
1951-53	1466
1954-56	1486
1957	1500
1958	1570

The reports referred to above contain, in addition to records of daily discharge at gaging stations, the results of discharge measurements at many points other than regular gaging stations.

Geological Survey reports containing data on quality of surface waters in Alaska prior to 1948 include the following:

Professional Paper 135, Composition of river and lake waters of the United States, 1924.

Bulletin 770, The data of geochemistry, 1924.

Water-Supply Paper 372, A water-power reconnaissance in south-central Alaska, 1915.

Water-Supply Paper 418, Mineral springs of Alaska, 1917.

Records of chemical quality and water temperature obtained from 1948 to September 1950 are presented in WSP 1372.

SOUTHEASTERN ALASKA

120. Winstanley Creek near Ketchikan

Location.--Lat 55°25', long 130°52', on right bank 0.3 mile downstream from Lower Winstanley Lake, 1.1 miles upstream from mouth, and 31 miles east of Ketchikan.

Drainage area.--13 sq mi, approximately.

Records available.--August 1936 to September 1938 (monthly discharge only, published in WSP 1372), August 1947 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 290 ft (by barometer).

Average discharge.--13 years, 152 cfs (110,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,440 cfs Nov. 22 (gage height, 4.44 ft); minimum, 14 cfs July 19 (gage height, 0.85 ft).
1936-38, 1947-58: Maximum discharge, 1,900 cfs Feb. 7 or 8, 1954 (gage height, 5.1 ft); minimum, 6.0 cfs Jan. 12, 1956 (gage height, 0.58 ft).
Flood sometime during period October 1938 to July 1947 reached a stage of 4.85 ft, from high-water mark in gage well (discharge, about 1,800 cfs).

Remarks.--Records good except those for periods of no gage-height record, which are poor. Upper and Lower Winstanley Lakes above gage have areas of 465 and 175 acres, respectively.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	587	238	230	58	58	221	40	113	161	37	237	
2	456	180	188	67	53	186	39	115	159	35	286	
3	304	142	201	138	48	159	40	120	154	33	247	
4	207	117	171	335	44	164	45	180	154	31	208	
5	148	108	138	359	40	172	52	247	151	29	240	
6	108	91	110	397	36	149	58	227	149	28	414	
7	86	80	110	392	34	130	61	208	149	27	500	
8	70	70	*220	339	32	107	64	224	144	26	500	
9	61	112	241	261	29	91	63	224	133	24	350	
10	51	152	188	199	28	78	65	218	120	23	260	
11	46	135	150	154	26	68	224	197	113	22	220	
12	44	124	130	122	*24	60	749	167	103	22	170	
13	72	124	117	113	23	53	642	169	96	21	*140	
14	112	110	130	169	21	47	432	227	93	20	156	
15	110	95	124	205	20	42	347	320	84	19	430	130
16	95	83	106	290	19	38	268	324	76	18		
17	83	83	95	376	19	35	218	261	72	16		
18	74	89	86	339	21	33	177	221	69	16		
19	62	85	75	335	37	30	144	215	70	14		
20	55	75	65	297	54	28	122	224	70	24		
21	49	75	59	237	88	25	*115	234	70	45		
22	44	808	54	202	211	24	103	224	68	56		
23	38	1,100	48	180	221	22	94	218	65	59		
24	36	997	46	146	205	22	83	221	*63	58	190	
25	41	843	43	122	199	22	76	211	59	64		
26	36	546	42	103	191	29	70	202	56	83		
27	81	442	40	91	211	35	69	205	52	83		
28	267	327	44	86	215	40	72	215	47	75		
29	526	259	43	81	-	41	84	202	43	66		
30	381	262	42	72	------	41	100	183	41	86		
31	319	------	51	64	------	40	------	169	------	159		------
Total	4,649	7,952	3,387	6,329	2,207	2,234	4,716	6,485	2,884	1,319	7,398	3,900
Mean	150	265	109	204	78.8	72.1	157	209	96.1	42.5	239	130
Cfsm	11.5	20.4	8.38	15.7	6.06	5.55	12.1	16.1	7.39	3.27	18.4	10.0
In.	13.30	22.75	9.69	18.11	6.31	6.39	13.49	18.55	8.25	3.77	21.16	11.16
Ac-ft	9,220	15,770	6,720	12,550	4,380	4,430	9,350	12,860	5,720	2,620	14,670	7,740

Calendar year 1957: Max 1,100 Min 10 Mean 130 Cfsm 10.0 In. 135.33 Ac-ft 93,830
Water year 1957-58: Max 1,100 Min 14 Mean 146 Cfsm 11.2 In. 152.93 Ac-ft 106,000

Peak discharge (base, 650 cfs).--Nov. 22 (12 p.m.) 1,440 cfs (4.44 ft); Apr. 12 (4 p.m.) 891 cfs (3.61 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Aug. 7-12, Aug. 15 to Sept. 30; discharge estimated on basis of weather records and records for Fish Creek near Ketchikan.

220. Harding River near Wrangell

Location.--Lat 56°13', long 131°38', on right bank 1 mile upstream from mouth on north shore of Bradfield Canal, 4 miles downstream from Fall Lake, and 34 miles southeast of Wrangell.

Drainage area.--95 sq mi, approximately.

Records available.--August 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (by barometer).

Average discharge.--7 years, 696 cfs (503,900 acre-ft per year).

Extremes.--Maximum discharge during year, 6,310 cfs at 12:01 a.m. Oct. 1, stage falling; maximum peak discharge during year, 6,180 cfs Aug. 23 (gage height, 11.31 ft); minimum observed, 55 cfs Feb. 16 (discharge measurement), but may have been less during period of ice effect.
1951-58: Maximum discharge, 9,820 cfs Oct. 2, 1952 (gage height, 13.84 ft), from rating curve extended above 4,500 cfs; minimum not determined.

Remarks.--Records good except those for periods of ice effect, which are poor. Fall Lake, at elevation 182 ft has an area of 170 acres.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,740	622	450	130		330	165	672	1,650	692	1,610	325
2	1,100	1,060	352	152		297	183	525	1,550	744	1,160	297
3	622	1,740	370	410		273	214	569	1,410	847	1,120	305
4	430	973	285	634		395	253	924	1,540	917	1,280	724
5	334	731	*238	465		305	317	666	1,590	994	2,390	994
6	277	492	220	938		224	338	653	1,800	1,050	3,020	1,760
7	238	370	220	1,120		189	313	770	2,080	1,010	2,540	1,540
8	214	334	508	622		165	297	889	1,850	875	1,150	731
9	195	536	445	425		148	293	750	1,490	798	770	530
10	186	450	301	313		138	285	628	1,510	738	*757	460
11	186	348	348	228	b80	130	832	514	1,220	945	646	440
12	400	385	366	207		124	2,120	405	1,060	812	640	440
13	1,480	410	309	198		b116	945	472	1,200	586	980	400
14	1,070	317	348	249		b110	616	1,040	1,170	564	1,250	375
15	731	285	301	321		b104	558	1,300	826	679	3,060	380
16	731	261	234	626	(*)	b100	435	1,020	847	698	1,540	666
17	514	277	214	764		b96	*361	731	1,410	705	861	492
18	390	317	198	470		b93	305	738	1,360	744	646	481
19	313	305	178	712		b91	269	1,230	1,570	980	738	705
20	269	231	160	610		b86	253	1,710	1,790	2,570	1,450	1,640
21	242	220	145	430	b100	b92	269	1,550	*1,760	2,050	1,230	847
22	210	1,540	148	348	481	b98	257	1,400	1,390	1,480	910	530
23	186	1,170	148	325	330	106	245	1,540	1,070	826	3,460	415
24	175	1,760	142	249	297	114	242	1,600	994	826	2,070	735
25	198	1,420	135	214	352	126	253	1,260	1,250	1,040	987	1,150
26	455	705	126	189	334	201	285	1,280	924	1,020	653	686
27	2,220	610	126	178	348	214	352	1,530	744	910	498	492
28	2,210	492	128	180	338	189	569	1,800	770	840	420	390
29	1,840	542	124	189	-	172	770	1,740	692	798	352	321
30	1,010	660	120	172	------	165	819	1,570	679	1,760	343	829
31	861	------	132	152	------	162	------	1,640	------	1,870	330	------
Total	22,027	19,563	7,519	12,220	4,180	5,153	13,413	33,116	39,196	31,368	38,861	20,080
Mean	711	652	243	394	149	166	447	1,068	1,307	1,012	1,254	669
Cfsm	7.48	6.86	2.56	4.15	1.57	1.75	4.71	11.2	13.8	10.7	13.2	7.04
In.	8.62	7.66	2.94	4.78	1.64	2.02	5.25	12.96	15.34	12.28	15.21	7.86
Ac-ft	43,690	38,800	14,910	24,240	8,290	10,220	26,600	65,680	77,740	62,220	77,080	39,830

Calendar year 1957: Max 4,990 Min - Mean 652 Cfsm 6.86 In. 93.21 Ac-ft 472,300
Water year 1957-58: Max 3,460 Min - Mean 676 Cfsm 7.12 In. 96.56 Ac-ft 489,300

Peak discharge (base, 3,500 cfs).--Oct. 28 (10 p.m.) 3,940 cfs (9.52 ft); Aug. 7 (3 a.m.) 3,860 cfs (9.45 ft); Aug. 15 (10 a.m.) 4,440 cfs (9.95 ft); Aug. 23 (2:30 p.m.) 6,180 cfs (11.31 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

260. Cascade Creek near Petersburg

Location.--Lat 57°01', long 132°47', on right bank 0.25 mile upstream from mouth on east shore of south arm of Thomas Bay, 2¼ miles downstream from Swan Lake, and 15 miles northeast of Petersburg.

Drainage area.--23.0 sq mi.

Records available.--October 1917 to November 1928, October 1946 to September 1958. Monthly discharge only for some periods, published in WSP 1372. Prior to October 1920, published as "at Thomas Bay, near Petersburg."

Gage.--Water-stage recorder. Altitude of gage is 120 ft (by barometer). Prior to October 1946, at different datum.

Average discharge.--23 years, 244 cfs (176,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,680 cfs at 12:01 a.m. Oct. 1, stage falling; maximum peak discharge during year, 1,140 cfs Aug. 7 (gage height, 6.42 ft); minimum, 23 cfs Feb. 16-19 (gage height, 1.83 ft).
1917-28, 1946-58: Maximum discharge, 3,280 cfs Sept. 11, 1947 (gage height, 10.0 ft, from floodmarks), from rating curve extended above 1,000 cfs; minimum, 11 cfs Mar. 27, 1948, Mar. 27, 1954, and Mar. 20, 21, 1956, caused by temporary storage behind ice jam upstream; minimum gage height, 0.68 ft Mar. 27, 1948.

Remarks.--Records good. Swan Lake, at elevation about 1,500 ft, has an area of 614 acres and a drainage area of 18.9 sq mi.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,310	254	119	57	55	60	37	147	530	260	750	123
2	742	666	107	68	50	59	40	143	554	282	506	116
3	440	810	106	95	46	57	42	168	572	300	395	125
4	292	850	*92	89	43	82	45	202	590	320	440	151
5	204	515	84	91	40	60	47	184	593	342	663	226
6	152	342	79	151	37	55	47	216	618	365	882	461
7	138	232	76	208	34	52	47	252	694	372	902	568
8	122	274	85	158	32	50	47	256	690	350	576	390
9	107	284	77	140	30	48	48	214	596	320	*395	276
10	96	207	104	123	29	47	48	194	558	300	306	202
11	94	166	206	105	28	45	124	162	479	382	254	170
12	134	170	148	92	27	42	228	138	416	378	226	162
13	315	145	130	85	26	41	186	134	443	315	260	152
14	360	125	123	92	25	38	152	216	410	274	312	140
15	360	117	110	112	24	36	133	264	365	262	596	136
16	350	106	95	130	23	35	*119	264	422	268	565	214
17	260	99	89	137	*23	34	107	230	576	270	400	177
18	190	97	82	114	23	34	97	220	524	292	318	151
19	162	93	77	127	25	32	89	270	512	350	302	148
20	136	84	74	124	27	32	83	375	*544	838	348	320
21	120	88	68	104	36	30	78	416	590	1,000	330	234
22	108	147	65	96	61	29	76	431	530	750	315	177
23	95	141	64	94	52	32	74	449	434	503	706	148
24	86	360	62	83	57	36	71	473	372	455	862	206
25	86	330	60	77	61	39	72	446	400	416	572	266
26	124	244	58	72	60	47	76	422	380	395	382	202
27	306	195	56	68	69	42	85	455	332	370	272	162
28	398	162	55	67	60	38	106	491	300	352	200	138
29	431	154	52	65	-	36	138	491	270	385	161	123
30	368	134	50	62	------	36	151	497	260	682	141	180
31	288	------	50	58	------	35	------	515	------	890	130	------
Total	8,374	7,591	2,703	3,144	1,103	1,339	2,693	9,335	14,554	13,038	13,467	6,244
Mean	270	253	87.2	101	39.4	43.2	89.8	301	485	421	434	208
Cfsm	11.7	11.0	3.79	4.39	1.71	1.88	3.90	13.1	21.1	18.3	18.9	9.04
In.	13.54	12.27	4.37	5.08	1.78	2.17	4.35	15.09	23.53	21.08	21.78	10.10
Ac-ft	16,610	15,060	5,360	6,240	2,190	2,660	5,340	18,520	28,870	25,860	26,710	12,380

Calendar year 1957: Max 2,040 Min 31 Mean 241 Cfsm 10.5 In. 141.98 Ac-ft 174,200
Water year 1957-58: Max 1,310 Min 23 Mean 229 Cfsm 9.96 In. 135.14 Ac-ft 165,800

Peak discharge (base, 1,100 cfs).--Aug. 7 (1 a.m.) 1,140 cfs (6.42 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Feb. 2-22.

340. Long River near Juneau

Location.--Lat 58°10'00", long 133°41'50", on right bank three-eighths of a mile upstream from Indian Lake, 1 mile downstream from Long Lake, and 27 miles southeast of Juneau.

Drainage area.--32.5 sq mi.

Records available.--October 1915 to September 1924, October to December 1926, June 1927 to May 1933, October 1951 to September 1958. Monthly discharge only for some periods, published in WSP 1372. Prior to January 1921, published as "below Second Lake, at Port Snettisham."

Gage.--Water-stage recorder. Altitude of gage is 183 ft (from topographic map). Prior to Oct. 1, 1929, at site 600 ft upstream at different datum.

Average discharge.--21 years (1915-24, 1927-32, 1951-58), 456 cfs (330,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,400 cfs at 12:01 a.m. Oct. 1, stage falling; maximum peak discharge during year, 2,410 cfs July 21 (gage height, 6.94 ft); minimum not determined.
1915-24, 1927-33, 1951-58: Maximum discharge, 6,000 cfs Sept. 10, 1927 (gage height, 10.2 ft, site and datum then in use), from rating curve extended above 1,700 cfs by logarithmic plotting; minimum recorded, 22 cfs Mar. 22, 1933.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,520	664	198					300	899	639	1,640	318
2	1,370	1,490	173					292	*984	667	1,150	305
3	814	1,890	184					302	1,050	716	912	318
4	552	1,710	175					447	1,120	778	1,000	374
5	386	1,100	153	250			90	527	1,140	854	1,540	930
6	295	738	135					632	1,100	926	1,570	1,660
7	237	524	122					636	1,190	926	1,240	1,720
8	200	417	118	320				656	1,250	862	958	1,070
9	*173	411	112	297				656	1,190	786	746	734
10	153	389	104	260			130	544	1,140	712	632	566
11	160	331	133			(*)	168	424	1,060	818	569	454
12	356	280	162				222	348	948	878	538	395
13	558	244	160				196	336	917	750	562	356
14	678	212	141				198	434	866	664	746	323
15	766	184	143		70	50	196	496	746	702	1,160	302
16	698	168	132				188	502	1,110	720	1,470	323
17	555	202	113				177	443	1,710	*720	1,120	310
18	414	216	101				162	420	1,400	842	806	283
19	325	179	100				150	450	1,170	1,020	806	266
20	269	152	97	160			136	583	1,160	1,710	1,010	474
21	227	143					135	684	1,360	2,310	1,200	430
22	196	153					132	716	1,390	1,720	1,040	342
23	169	143					128	746	1,110	1,240	1,680	323
24	146	160					124	782	894	1,030	1,820	562
25	148	229					130	695	854	866	1,290	614
26	494	225	85				145	600	830	802	886	534
27	1,160	225					177	576	750	814	681	437
28	1,360	210					222	628	702	822	538	371
29	1,220	253			-		266	667	639	846	443	320
30	890	222			------		297	712	618	1,280	377	471
31	709	------			------		------	782	------	1,930	342	------
Total	18,198	13,464	3,691	5,987	1,960	1,550	4,489	17,016	31,297	30,350	30,672	15,885
Mean	587	449	119	193	70	50	150	549	1,043	979	989	530
Cfsm	18.1	13.8	3.66	5.94	2.15	1.54	4.62	16.9	32.1	30.1	30.4	16.3
In.	20.82	15.41	4.22	6.85	2.24	1.77	5.14	19.47	35.81	34.73	35.10	18.18
Ac-ft	36,100	26,710	7,320	11,880	3,890	3,070	8,900	33,750	62,080	60,200	60,840	31,510

Calendar year 1957: Max 4,510 Min - Mean 450 Cfsm 13.8 In. 187.95 Ac-ft 325,800
Water year 1957-58: Max 2,520 Min - Mean 478 Cfsm 14.7 In. 199.74 Ac-ft 346,200

Peak discharge (base 2,000 cfs).--July 21 (9:30 a.m.) 2,410 cfs (6.94 ft); July 31 (10:30 a.m.) 2,040 cfs (6.38 ft); Aug. 23 (7 p.m.) 2,150 cfs (6.55 ft); Sept. 6 (5 p.m.) 2,340 cfs (6.84 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 21 to Jan. 7, Jan. 11 to Apr. 9 (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 1 discharge measurement, weather records, and records for Dorothy Creek near Juneau.

400. Dorothy Creek near Juneau

Location.--Lat 58°13'40", long 134°02'25", on left bank 0.7 mile downstream from Lake Bart, 0.8 mile upstream from mouth, 3 miles downstream from Lake Dorothy, and 14 miles southeast of Juneau.

Drainage area.--15.2 sq mi.

Records available.--October 1929 to October 1941, September 1942 to December 1943, June 1944 to September 1958. Monthly discharge only prior to October 1945, published in WSP 1372.

Gage.--Water-stage recorder. Altitude of gage is 350 ft (from topographic map). Prior to Sept. 14, 1937, at site 100 ft upstream from mouth at different datum.

Average discharge.--27 years (1929-41, 1942-43, 1944-58), 143 cfs (103,500 acre-ft per year).

Extremes.--Maximum discharge during year, 886 cfs at 12:01 a.m. Oct. 1, stage falling; maximum peak discharge during year, 560 cfs July 22 (gage height, 3.97 ft); minimum, 11 cfs Mar. 25, 31.
1929-41, 1942-58: Maximum discharge, 1,780 cfs Nov. 3, 1949 (gage height, 5.85 ft), from rating curve extended above 560 cfs; minimum recorded, 6 cfs Mar. 23, 25, 28, 1933.

Remarks.--Records good. Dorothy Lake (area, 952 acres) lies at an altitude of 2,423 ft, less than 4 miles from mouth of Dorothy Creek; Lieuy Lake (area, 80 acres) lies at an altitude of 1,711 ft; and Bart Lake (area, 250 acres) lies at an altitude of 986 ft.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	809	*224	56	26	23	15	*12	47	173	214	362	171
2	570	275	53	26	22	15	13	49	188	207	370	154
3	415	374	51	31	21	16	14	55	201	201	338	149
4	330	446	47	38	20	16	14	62	220	201	330	149
5	275	407	44	36	19	16	14	67	244	207	374	154
6	233	342	41	46	18	17	14	75	264	214	441	214
7	207	293	38	57	18	16	15	81	289	220	450	300
8	188	250	36	52	17	16	15	84	311	224	403	315
9	171	227	35	*52	17	16	16	86	330	217	350	293
10	157	207	34	52	16	16	16	86	334	*210	311	258
11	147	188	36	50	16	16	26	84	334	217	268	*227
12	152	173	36	48	16	16	29	81	323	240	233	204
13	160	160	36	46	15	15	24	80	323	258	220	182
14	173	147	36	45	15	15	24	*86	315	247	224	168
15	188	135	36	43	14	15	25		300	240	275	154
16	195	125	35	42	14	14	26		330	233	323	149
17	192	117	34	45	14	14	26		398	230	334	144
18	188	109	32	43	14	14	26	a100	432	230	319	139
19	176	101	31	43	14	13	26		398	264	311	135
20	165	92	29	41	13	14	24		386	338	315	135
21	154	86	28	39	13	13	25		403	501	330	130
22	144	82	26	38	14	12	24	119	432	540	334	125
23	132	75	26	36	14	12	24	130	403	477	424	119
24	123	71	25	35	14	12	24	139	362	424	496	130
25	115	74	24	34	14	11	24	149	338	370	472	132
26	135	69	24	32	14	12	26	149	323	334	403	130
27	157	66	24	30	14	12	30	152	304	311	342	127
28	185	66	24	29	14	12	36	154	275	293	300	125
29	210	66	24	27	-	12	42	154	250	275	250	121
30	224	59	24	26	-------	12	44	160	230	279	217	125
31	227	-------	24	24	-------	11	-------	165	-------	315	188	-------
Total	6,897	5,106	1,049	1,212	447	436	698	3,194	9,413	8,731	10,307	5,058
Mean	222	170	33.8	39.1	16.0	14.1	23.3	103	314	282	332	169
Cfsm	14.6	11.2	2.22	2.57	1.05	0.928	1.53	6.78	20.7	18.6	21.8	11.1
In.	16.87	12.49	2.57	2.97	1.09	1.07	1.71	7.81	23.03	21.36	25.22	12.38
Ac-ft	13,680	10,130	2,080	2,400	887	865	1,380	6,340	18,670	17,320	20,440	10,030

Calendar year 1957: Max 809 Min - Mean 140 Cfsm 9.21 In. 124.76 Ac-ft 101,100
Water year 1957-58: Max 809 Min 11 Mean 144 Cfsm 9.47 In. 128.57 Ac-ft 104,200

Peak discharge (base, 400 cfs).--Nov. 4 (11 a.m.) 450 cfs (3.74 ft); June 18 (2 a.m.) 446 cfs (3.73 ft); June 22 (10 a.m.) 436 cfs (3.71 ft); July 22 (1 a.m.) 560 cfs (3.97 ft); Aug. 7 (4 a.m.) 459 cfs (3.76 ft); Aug. 24 (7 p.m.) 506 cfs (3.86 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for stations on nearby streams.
Note.--Stage-discharge relation affected by ice Jan. 7-27.

440. Carlson Creek near Juneau

Location.--Lat 58°19'00", long 134°10'15", on left bank between two unnamed tributaries, 1½ miles upstream from mouth, 1¾ miles downstream from Sheep Fork, and 8¾ miles east of Juneau.

Drainage area.--24.3 sq mi.

Records available.--July 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Average discharge.--7 years, 320 cfs (231,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,210 cfs Nov. 2 (gage height, 7.71 ft), from rating curve extended above 2,000 cfs; minimum not determined.
1951-58: Maximum discharge, 4,500 cfs Sept. 30, 1957 (gage height, 9.55 ft); minimum not determined.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	564	*798	93	a38			a35	286	970	393	761	127
2	323	2,600	85	a45			*48	268	1,000	399	444	122
3	224	1,660	90	66			61	396	990	417	399	202
4	177	1,190	79	136			64	762	1,030	438	1,060	1,180
5	144	540	73	86			64	798	915	469	1,280	678
6	119	348	65	238			68	1,020	890	434	758	1,830
7	*102	241	61	418			79	682	980	387	562	658
8	92	203	57	223			83	594	1,020	335	345	332
9	82	293	55	*143			91	458	852	*293	266	233
10	77	480	50	98			109	348	820	275	229	187
11	162	284	76				264	266	634	441	202	*162
12	447	219	80				251	223	626	320	192	149
13	497	185	73	a75			184	*249	758	257	227	137
14	456	148	57				152	452	550	277	414	135
15	758	124	56				138	594	510	369	1,030	125
16	515	130	50	285	a22	a23	121	534	1,560	271	642	137
17	335	158	47	219			106	411	1,040	256	396	117
18	238	175	a43	185			94	408	690	430	303	104
19	188	131	a39	116			87	494	682	502	384	114
20	156	103	a37	89			83	812	848	1,680	965	318
21	132	106	44	70			85	905	1,240	1,240	650	178
22	112	137	48	64			94	780	670	594	480	135
23	98	99	48	54			97	766	462	498	1,840	290
24	92	94	44	53			94	776	414	414	654	771
25	152	156		48			106	538	582	310	384	590
26	1,000	195		45			130	472	455	325	275	381
27	1,320	152					200	630	375	355	243	266
28	990	204	a37				310	694	355	303	197	249
29	675	185		a35	-		348	717	340	491	166	199
30	452	122			------		335	780	363	1,450	147	1,020
31	436	------			------		------	920	------	1,470	136	------
Total	11,115	11,460	1,709	3,269	616	713	3,981	18,033	22,621	16,073	15,831	11,126
Mean	359	382	55.1	105	22	23	133	582	754	518	511	371
Cfsm	14.8	15.7	2.27	4.32	0.905	0.947	5.47	24.0	31.0	21.3	21.0	15.3
In.	17.01	17.54	2.62	5.00	0.94	1.09	6.09	27.60	34.62	24.60	24.23	17.03
Ac-ft	22,050	22,730	3,390	6,480	1,220	1,410	7,900	35,770	44,870	31,880	31,400	22,070

Calendar year 1957: Max 2,600 Min - Mean 308 Cfsm 12.6 In. 171.05 Ac-ft 221,700
Water year 1957-58: Max 2,600 Min - Mean 319 Cfsm 13.1 In. 178.37 Ac-ft 231,200

Peak discharge (base, 2,500 cfs).--Nov. 2 (8:30 a.m.) 3,210 cfs (7.71 ft); July 20 (7:30 p.m.) 2,680 cfs (6.85 ft); Aug. 23 (6 a.m.) 2,890 cfs (7.20 ft); Sept. 6 (9 a.m.) 3,150 cfs (7.63 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Gold Creek at Juneau.

480. Sheep Creek near Juneau

Location.--Lat 58°16'30", long 134°18'50", on right bank 0.3 mile upstream from diversion dam of Alaska-Juneau Gold Mining Co.'s Sheep Creek powerplant, 1 mile northeast of Thane, 1¼ miles upstream from mouth, and 4 miles southeast of Juneau.

Drainage area.--4.30 sq mi.

Records available.--January 1911 to December 1913, August 1916 to December 1920, October 1946 to September 1958. Monthly discharge only for some periods, published in WSP 1372. Prior to 1946, published as "near Thane."

Gage.--Water-stage recorder and wooden control. Datum of gage is 643.5 ft above mean sea level (levels by Conservation Division, U. S. Geological Survey). Prior to August 1916, staff gage at same site and datum.

Average discharge.--18 years, 45.8 cfs (33,160 acre-ft per year).

Extremes.--Maximum discharge during year, 416 cfs Nov. 2 (gage height, 2.37 ft); minimum, 2.0 cfs Mar. 27, 28 (gage height, 0.41 ft).
1911-13, 1916-20, 1946-58: Maximum discharge, 840 cfs Sept. 8, 1948 (gage height, 3.60 ft); no flow at times at gage site but probably some flow at all times at diversion dam 0.3 mile downstream (records for period 1916-20 based on measurements at diversion dam).

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	99	75	25	7.4			2.8	33	92	36	92	26
2	66	289	24	7.0			3.0	33	87	36	70	24
3	51	184	23	14			3.7	52	84	35	75	29
4	*43	128	21	24			4.8	66	84	35	82	57
5	36	94	19	21			6.2	77	80	36	*87	55
6	31	70	18	39			8.2	115	84	35	75	104
7	27	53	17	*51			10	97	87	32	68	75
8	24	*51	16	36			12	87	89	28	51	57
9	23	55	15	33			13	75	72	24	45	48
10	22	57	14				16	66	68	27	39	41
11	21	43	17				35	57	55	42	35	35
12	25	38	18	a22			38	48	57	29	32	*32
13	27	34	17				33	49	66	24	31	30
14	33	30	16		(*)	a4.0	29	66	46	24	35	28
15	62	26	16		a6.0		27	82	46	29	60	25
16	43	25	16	20			24	75	153	24	48	29
17	34	31	15	31			22	62	94	24	36	24
18	29	29	14	29			20	62	70	43	32	22
19	26	25	13	28			19	68	68	57	33	22
20	24	23		25			17	94	80	136	60	29
21	22	24		24			16	104	94	112	53	24
22	19	25		21			16	*99	60	77	46	21
23	18	22		20			*16	99	46	82	175	28
24	17	25		19			15	89	43	66	82	75
25	18	39	a9.5				15	70	51	53	62	51
26	51	35					16	60	42	57	51	43
27	72	33				*2.0	24	64	*36	57	45	38
28	75	34		a14		2.0	33	72	35	48	39	36
29	62	34			-	2.2	38	75	32	61	34	31
30	53	29	7.8		------	2.2	38	80	33	104	31	62
31	51	------	7.8		------	2.4	------	87	------	*115	28	------
Total	1,204	1,660	444.6	682.4	168.0	114.8	570.7	2,263	2,034	1,588	1,732	1,201
Mean	38.8	55.3	14.3	22.0	6.0	3.70	19.0	73.0	67.8	51.2	55.9	40.0
Cfsm	9.02	12.9	3.33	5.12	1.40	0.860	4.42	17.0	15.8	11.9	13.0	9.30
In.	10.41	14.36	3.85	5.90	1.45	0.99	4.94	19.57	17.59	13.73	14.98	10.39
Ac-ft	2,390	3,290	882	1,350	333	228	1,130	4,490	4,030	3,150	3,440	2,380

Calendar year 1957: Max 289 Min 0 Mean 37.4 Cfsm 8.70 In. 118.20 Ac-ft 27,100
Water year 1957-58: Max 289 Min 2.0 Mean 37.4 Cfsm 8.70 In. 118.16 Ac-ft 27,090

Peak discharge (base, 460 cfs).--No peak above base.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for Gold Creek at Juneau.

500. Gold Creek at Juneau

Location.--Lat 58°18'25", long 134°24'05", on left bank 10 ft downstream from highway bridge, 150 ft upstream from Alaska Electric Light and Power Co. dam and diversion, half a mile northeast of Juneau, and 1 mile upstream from mouth.

Drainage area.--9.76 sq mi.

Records available.--July 1916 to December 1920, October 1946 to September 1948, October 1949 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 245 ft (from topographic map). July 20, 1916, to Dec. 31, 1920, water-stage recorder at site 50 ft upstream at different datum. Sept. 11, 1946, to Sept. 30, 1948, staff gage at site 0.7 mile downstream at different datum.

Average discharge.--15 years, (1916-20, 1946-48, 1949-58), 104 cfs (75,290 acre-ft per year).

Extremes.--Maximum discharge during year, 1,140 cfs Nov. 2 (gage height, 5.31 ft); minimum, 3.3 cfs Mar. 19, 20 (gage height, 2.04 ft).
1916-20, 1946-48, 1949-58: Maximum discharge, 2,600 cfs Sept. 26, 1918 (gage height, 6.8 ft, site and datum then in use), from rating curve extended above 520 cfs; no flow at times during winters of 1951 and 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. One small diversion above station for domestic water supply.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	220	216	38	11	14	10	8.5	75	274	108	270	34
2	129	910	34	20	12	9.4	11	73	265	*113	176	32
3	93	610	34	54	10	10	13	112	256	113	173	52
4	75	480	30	57	b9.0	14	15	196	260	123	283	216
5	*63	288	*28	43	b8.2	11	17	212	238	135	*310	162
6	54	184	25	132	b7.5	9.4	18	278	242	126	256	396
7	47	129	24	162		*8.2	20	234	288	108	192	229
8	40	123	22	84		6.8	*22	184	306	93	132	139
9	36	145	20	56		6.8	24	142	234	82	106	100
10	32	204	23	*39	a8.0	6.2	27	113	234	88	90	*82
11	*38	119	41	34		6.0	*86	90	176	159	80	71
12	63	90	32	29	*9.4	5.5	86	75	176	100	75	64
13	88	71	29	29		5.2	60	77	212	73	88	58
14	90	*60	26	28		5.2	50	123	142	84	116	56
15	156	50	24	25		5.0	43	*162	126	119	220	50
16	119	48	21	43		4.8	39	139	397	*86	139	58
17	88	56	19	98		4.5	33	106	*292	84	98	46
18	68	48	18	68	a7.5	3.9	29	108	208	148	82	38
19	57	41	18	57		3.9	28	139	204	176	93	40
20	49	35	15	44		3.5	26	234	270	a550	204	71
21	40	37	13	37		3.7	26	288	350	a320	159	49
22	34	39	13	31		3.9	25	256	188	a230	139	40
23	30	31	14	30	7.6	3.7	26	247	126	a180	476	59
24	26	47	13	*26	7.3	3.5	*26	216	113	a150	176	180
25	40	86	12	24	6.5	*3.7	26	159	148	a130	98	148
26	156	66	12	22	6.2	5.0	30	139	116	a120	73	113
27	296	57	*12	20	8.5	5.5	46	159	93	a110	63	86
28	*229	58	12	19	11	5.5	71	*180	88	a120	53	82
29	176	58	11	18	-	6.0	84	196	86	a200	46	68
30	123	47	11	16	------	6.5	86	212	96	*500	40	214
31	110	------	11	15	------	6.8	------	247	------	435	37	------
Total	2,865	4,433	655	1,369	232.2	193.1	1,101.5	5,171	6,204	5,163	4,543	3,033
Mean	92.4	148	21.1	44.2	8.29	6.23	36.7	167	207	167	147	101
Cfsm	9.47	15.2	2.16	4.53	0.849	0.638	3.76	17.1	21.2	17.1	15.1	10.3
In.	10.92	16.89	2.50	5.22	0.88	0.74	4.20	19.70	23.64	19.67	17.31	11.56
Ac-ft	5,680	8,790	1,300	2,720	461	383	2,180	10,260	12,310	10,240	9,010	6,020

Calendar year 1957: Max 910 Min 2.3 Mean 98.8 Cfsm 10.1 In. 137.38 Ac-ft 71,510
Water year 1957-58: Max 910 Min 3.5 Mean 95.8 Cfsm 9.82 In. 133.23 Ac-ft 69,350

Peak discharge (base, 600 cfs).--Nov. 2 (8:30 a.m.) 1,140 cfs (5.31 ft); July 20 (time and discharge unknown); July 30 (time and discharge unknown); Aug. 23 (4:15 a.m.) 926 cfs (4.93 ft); Sept. 6 (11:30 a.m.) 725 cfs (4.65 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Sheep Creek near Juneau.
b Stage-discharge relation affected by ice.

520. Lemon Creek near Juneau

Location.--Lat 58°23'30", long 134°25'15", on left bank a quarter of a mile upstream from Canyon Creek, 4½ miles upstream from mouth, and 6 miles north of Juneau.

Drainage area.--12.1 sq mi.

Records available.--August 1951 to November 1953, July 1954 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 650 ft (from topographic map).

Average discharge.--6 years, 150 cfs (108,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,450 cfs Aug. 15 (gage height, 3.60 ft), from rating curve extended above 1,200 cfs by logarithmic plotting; minimum observed, 2.6 cfs Mar. 19 (discharge measurement), but may have been lower during winter period of no gage-height record.
1951-58: Maximum discharge, 2,080 cfs Sept. 14, 1952 (gage height, 4.08 ft), from rating curve extended above 650 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	555	163	15				8	46	295	276	615	166
2	240	505	15				10	41	295	306	406	155
3	155	565	15				12	58	302	350	374	220
4	113	388	13				14	59	323	384	605	338
5	86	218	12				14	59	320	420	850	388
6	69	153	11				16	84	342	402	692	761
7	63	99	10				16	79	397	354	540	555
8	58	92	11				16	63	366	292	354	354
9	49	88	10				18	47	346	276	295	266
10	44	98	15				19	39	358	298	295	*207
11	129	66	21				48	30	320	410	289	189
12	285	*51	15				44	27	316	374	330	
13	323	44	13				26	37	388	316	425	
14	226	37	12				20	51	309	358	580	
15	248	34	10				18	63	276	505	811	
16	212	32	10	12	5.0	3.5	16	59	520	445	600	
17	166	35	8.8				13	47	535	392	370	
18	133	34					12	56	480	510	326	
19	104	25				(*)	11	79	500	525	420	
20	77	24					11	144	605	850	565	
21	*60	25					12	202	670	876	545	170
22	47	29					10	215	465	648	490	
23	41	21					10	*207	350	515	994	
24	39	34	6.0				11	177	*302	470	811	
25	65	40					*14	127	374	362	415	
26	290	29					19	111	350	379	279	
27	370	23					38	134	276	505	257	
28	346	24					52	161	240	505	212	
29	282	22			-		54	181	243	555	181	
30	202	18					52	210	263	*1,000	174	
31	172							280		*1,020	184	
Total	5,249	3,016	300.8	372	140.0	108.5	634	3,153	11,126	14,878	14,284	6,829
Mean	169	101	9.70	12	5.0	3.5	21.1	102	371	480	461	228
Cfsm	14.0	8.35	0.802	0.992	0.413	0.289	1.74	8.43	30.7	39.7	38.1	18.8
In.	16.13	9.27	0.92	1.14	0.43	0.33	1.95	9.69	34.20	45.73	43.90	20.99
Ac-ft	10,410	5,980	597	738	278	215	1,260	6,250	22,070	29,510	28,330	13,550

Calendar year 1957: Max 1,430 Min - Mean 171 Cfsm 14.1 In. 191.71 Ac-ft 123,700
Water year 1957-58: Max 1,020 Min - Mean 165 Cfsm 13.6 In. 184.58 Ac-ft 119,200

Peak discharge (base, 1,200 cfs).--July 29 (12 p.m.) 1,380 cfs (3.52 ft); Aug. 15 (3 p.m.) 1,450 cfs (3.60 ft); Aug. 23 (7:30 a.m.) 1,360 cfs (3.50 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 18 to Apr. 3 (stage-discharge relation affected by ice during most of period), Sept. 12-30; discharge estimated on basis of 1 discharge measurement at gage, 29 discharge measurements at site 4 miles downstream, weather records at Juneau, and records for Gold Creek at Juneau.

600. Perseverance Creek near Wacker

Location.--Lat 55°24'40", long 131°40'05", on Revillagigedo Island, on right bank 500 ft downstream from Perseverance Lake, half a mile upstream from Connell Lake, 2 miles east of Wacker, and 4 miles north of Ketchikan.

Drainage area.--2.81 sq mi.

Records available.--October 1931 to September 1938, November 1938, June to September 1939, October 1946 to September 1958. Monthly discharge only for some periods, published in WSP 1372.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 600 ft (from topographic map). Prior to October 1946, at site 100 ft upstream at different datum.

Average discharge.--19 years (1931-38, 1946-58), 36.3 cfs (26,280 acre-ft per year).

Extremes.--Maximum discharge during year, 505 cfs Apr. 11 (gage height, 5.05 ft), from rating curve extended above 150 cfs; minimum daily, 0.6 cfs July 4-19.
1931-39, 1946-58: Maximum discharge, 543 cfs Oct. 30, 1949 (gage height, 5.26 ft), from rating curve extended above 150 cfs; minimum daily, 0.4 cfs Sept. 26, 1957.

Remarks.--Records good except those below 5 cfs and those above 100 cfs, which are poor.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	22	59	60	6.7	58	7.0	14	6.2	0.7	21	6.5
2	58	24	42	69	5.5	41	6.7	13	5.2	.7	96	5.8
3	34	49	37	242	4.3	31	7.0	18	4.8	.7	165	11
4	21	41	29	138	3.2	37	8.0	44	4.2	.6	121	29
5	13	30	21	99	3.0	40	9.0	40	3.4	.6	281	34
6	9.5	21	18	116	2.2	29	9.5	38	2.6	.6	231	70
7	6.7	14	*24	95	2.0	23	9.5	52	2.4	.6	122	59
8	6.1	12	65	48	2.5	16	9.0	77	1.7	.6	53	33
9	5.2	34	39	33	2.5	12	8.5	78	1.6	.6	30	24
10	4.6	37	25	21	2.5	9.5	13	50	1.6	.6	26	17
11	5.2	25	23	14	*2.5	8.5	326	34	1.7	.6	*19	12
12	30	39	23	12	2.5	7.0	336	27	1.6	.6	14	8.7
13	106	38	33	42	2.2	6.4	104	59	1.6	.6	27	7.0
14	54	29	38	120	2.2	5.8	71	230	1.4	.6	80	6.8
15	33	22	27	105	2.0	5.2	61	225	1.3	.6	146	9.1
16	25	16	21	132	1.8	4.9	39	80	1.3	.6	66	34
17	19	35	20	84	1.8	4.6	26	40	1.2	.6	32	28
18	13	33	16	66	3.0	4.6	*18	26	1.2	.6	20	39
19	10	22	12	75	22	4.3	14	21	1.1	.6	18	61
20	8.0	15	8.5	58	41	4.0	12	26	1.1	10	39	76
21	6.7	34	7.0	36	66	3.8	13	24	1.1	18	39	58
22	5.8	180	6.7	37	98	3.5	12	18	1.0	13	29	32
23	4.9	210	7.0	34	49	4.0	11	16	1.0	9.9	34	21
24	4.6	258	6.1	21	49	5.5	9.9	14	.9	7.2	41	66
25	14	126	5.8	16	57	7.5	9.5	13	**1.0	6.5	35	68
26	106	81	5.8	13	66	13	9.1	13	.9	6.0	27	36
27	201	68	7.0	12	77	15	8.7	12	.9	4.8	20	26
28	239	42	9.0	17	57	12	10	11	.8	3.4	15	18
29	137	54	8.0	18	-	10	13	9.5	.8	2.5	10	16
30	55	60	14	13	------	8.5	14	7.9	.7	4.8	9.5	14
31	33	------	104	9.0	------	8.0	------	7.0	------	9.1	9.1	------
Total	1,369.3	1,671	760.9	1,855.0	634.4	442.6	1,204.4	1,337.4	56.3	106.9	1,875.6	925.9
Mean	44.2	55.7	24.5	59.8	22.7	14.3	40.1	43.1	1.88	3.45	60.5	30.9
Cfsm	15.7	19.8	8.72	21.3	8.08	5.09	14.3	15.3	0.669	1.23	21.5	11.0
In.	18.12	22.12	10.07	24.55	8.40	5.86	15.94	17.70	0.75	1.41	24.82	12.25
Ac-ft	2,720	3,310	1,510	3,680	1,260	878	2,390	2,650	112	212	3,720	1,840

Calendar year 1957: Max 258 Min 0.4 Mean 25.0 Cfsm 8.90 In. 120.96 Ac-ft 18,130
Water year 1957-58: Max 336 Min 0.6 Mean 33.5 Cfsm 11.9 In. 161.99 Ac-ft 24,280

Peak discharge (base, 250 cfs).--Oct. 28 (3 p.m.) 356 cfs (4.20 ft); Nov. 23 (9 p.m.) 409 cfs (4.51 ft); Jan. 3 (4 p.m.) 303 cfs (3.89 ft); Apr. 11 (11 p.m.) 505 cfs (5.05 ft); May 14 (11 p.m.) 368 cfs (4.27 ft); Aug. 5 (6 p.m.) 424 cfs (4.60 ft).

* Discharge measurement made on this day.
** Field estimate made on this day.

620. Ward Creek near Wacker

Location.--Lat 55°25'50", long 131°40'00", on Revillagigedo Island, on right bank three-quarters of a mile downstream from Connell Lake Dam, 2¼ miles northeast of Wacker, and 5½ miles north of Ketchikan.

Drainage area.--14.0 sq mi.

Records available.--October 1948 to August 1958 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 150 ft (from topographic map). Prior to June 20, 1952, water-stage recorder at several sites three-quarters of a mile upstream at various datums. June 20 to Dec. 11, 1952, staff gage at present site and datum.

Extremes.--Maximum discharge during period Oct. 1, 1957, to Aug. 11, 1958, 1,080 cfs May 14 (gage height, 7.49 ft), from rating curve extended above 230 cfs; minimum daily, 0.1 cfs July 15-19, 24, 29.

1948-58: Maximum discharge, 2,600 cfs Apr. 16, 1952 (gage height, 6.83 ft, site and datum then in use); minimum daily, that of July 15-19, 24, 29, 1958.

Remarks.--Records poor. Flow regulated by Lake Connell starting in October 1953 (capacity, 11,510 acre-ft). Water diverted above station from Lake Connell by 60-inch pipeline for use by Ketchikan Pulp Co. at Ward Cove.

Discharge, in cubic feet per second, October 1957 to August 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	212	12	159	158		170	29	4.6	22	0.4	2.2	
2	146	15	105	227		96	29	4.3	22	.5	20	
3	20	27	91	945		66	18	5.2	22	.3	23	
4	18	18	63	461		86	8.3	12	22	.3	12	
5	17	14	56	188	a4	96	8.6	7.2	22	.3	56	
6	16	9.0	49	274		57	9.5	6.6	14	.3	51	
7	7.9	6.2	*41	365		51	8.6	9.0	6.6	.6	64	
8	1.6	8.0	129	154		51	7.6	18	6.2	.4	57	
9	1.4	19	83	97		50	6.9	12	5.5	.4	56	
10	1.3	10	37	63		50	9.0	9.0	5.5	.3	56	
11	3.8	7.2	27	60	*2.5	49	73	10	5.5	.3	*56	
12	22	19	26	60	2.8	49	645	10	4.9	.3	-	
13	43	12	48	77	2.4	49	218	326	3.7	.3	-	
14	14	11	111	177	2.2	49	199	951	3.4	.2	-	
15	18	8.3	60	245	2.2	49	177	603	3.1	.1	-	
16	18	6.6	32	501	1.9	48	94	150	2.8	.1	-	
17	17	28	34	321	1.9	29	60	65	2.8	.1	-	
18	17	11	26	172	7.6	8.0	*49	46	2.8	.1	-	
19	16	8.0	23	236	20	7.6	49	45	2.8	.1	-	
20	16	6.9	22	198	15	7.2	49	45	2.8	.4	-	
21	8.6	19	22	97	49	7.2	49	45	2.8	.2	-	
22	2.8	139	22	82	170	7.6	49	40	2.8	.2	-	
23	2.4	326	14	76	110	7.6	48	33	1.8	.2	-	
24	3.7	603	9.6	62	154	7.6	47	32	.7	.1	-	
25	9.0	323	16	60	171	8.3	36	32	**.7	.2	-	
26	34	182	15	62	139	9.0	22	27	.7	.2	-	
27	27	187	20	60	156	7.6	22	22	.6	.2	-	
28	52	97	20	68	150	7.6	13	22	.4	.2	-	
29	24	134	17	61	-	7.2	4.9	22	.3	.1	-	
30	16	153	20	a55	------	8.0	4.6	22	.5	.2	-	
31	14	------	89	a55	------	16	------	22	------	.2	-	------
Total	819.5	2,419.2	1,486.6	5,617	1,197.5	1,211.5	2,043.0	2,657.9	193.7	7.8	-	
Mean	26.4	80.6	48.0	181	42.8	39.1	68.1	85.7	6.46	0.25	-	
Ac-ft	1,630	4,800	2,950	11,140	2,380	2,400	4,050	5,270	384	15	-	

Calendar year 1957: Max 603 Min 0.6 Mean 28.3 Ac-ft 20,480
Water year 1957-58: Max - Min - Mean - Ac-ft -

* Discharge measurement made on this day.
** Field estimate made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, engineer's notes, weather records, and records for stations on nearby streams.

680. Mahoney Creek near Ketchikan

Location.--Lat 55°25'30", long 131°30'45", on Revillagigedo Island, on right bank an eighth of a mile upstream from mouth, an eighth of a mile downstream from Mahoney Lake, and 8 miles northeast of Ketchikan.

Drainage area.--5.70 sq mi.

Records available.--September 1920 to October 1925, September 1926 to October 1933, October 1947 to September 1958 (discontinued). Monthly discharge only for some periods, published in WSP 1372. Prior to January 1921, published as "at George Inlet."

Gage.--Water-stage recorder. Altitude of gage is 45 ft (by barometer). Prior to October 1947, at different datum.

Average discharge.--23 years, 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge during year, 1,350 cfs Apr. 11 (gage height, 3.90 ft); minimum, 14 cfs Feb. 15-18 (gage height, 0.89 ft).
1920-25, 1926-33, 1947-58: Maximum discharge, 2,530 cfs Feb. 2, 1954 (gage height, 4.66 ft), from rating curve extended above 1,100 cfs; minimum daily, 1.5 cfs Jan. 30 to Feb. 1, 1950.

Remarks.--Records good except those for period of no gage-height record, which are poor. Mahoney Lake at elevation 76 ft has an area of 163 acres.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	198	48	93	69	29	107	21	82	130	40	58	
2	117	50	74	89	26	66	20	82	132	38	314	
3	69	115	71	304	24	49	20	91	138	39	325	
4	47	115	54	288	21	52	21	212	148	40	325	
5	38	76	44	189	20	61	22	177	158	43	594	
6	31	55	41	292	19	53	23	150	155	47	450	
7	27	42	50	266	18	47	24	216	158	53	288	
8	24	46	168	162	18	40	24	238	150	56	174	
9	23	158	115	105	17	35	24	183	119	52	105	
10	21	111	*66	63	17	32	33	115	101	45	152	
11	20	71	50	45	16	29	586	75	99	39	107	
12	33	171	45	37	16	26	864	58	91	36	*66	
13	258	140	64	60	16	24	284	186	89	33	145	
14	150	97	91	171	15	23	216	438	85	30	340	
15	76	70	61	183	*14	22	171	480	70	31	404	
16	78	56	46	340	14	21	99	230	64	33	174	60
17	61	134	49	250	14	20	71	138	74	35	85	
18	46	86	42	177	14	19	54	103	93	35	54	
19	38	56	35	160	22	18	*45	113	134	32	45	
20	32	43	30	132	75	18	40	195	132	46	85	
21	28	82	28	83	286	17	38	202	123	88	107	
22	26	492	26	66	432	17	33	155	101	66	73	
23	23	525	26	60	177	17	30	148	76	47	59	
24	22	638	24	47	140	16	28	155	63	38	62	
25	38	274	24	38	202	17	27	155	*64	33	58	
26	283	186	23	35	140	18	27	177	58	32	50	
27	390	160	23	33	134	19	27	192	51	31	42	
28	390	85	24	42	115	20	31	192	48	29	36	
29	209	107	24	58	-	21	43	165	45	27	32	
30	99	105	25	44	-------	21	69	136	42	27	29	
31	63	-------	52	35	-------	21	-------	127	-------	34	27	-------
Total	2,958	4,394	1,588	3,923	2,051	966	3,015	5,366	2,991	1,255	4,865	1,800
Mean	95.4	146	51.2	127	73.2	31.2	100	173	99.7	40.5	157	60
Cfsm	16.7	25.6	8.98	22.3	12.8	5.47	17.5	30.4	17.5	7.11	27.5	10.5
In.	19.30	28.67	10.36	25.60	13.38	6.30	19.67	35.01	19.51	8.19	31.74	11.74
Ac-ft	5,870	8,720	3,150	7,780	4,070	1,920	5,980	10,640	5,930	2,490	9,650	3,570

Calendar year 1957: Max 638 Min 8.6 Mean 79.7 Cfsm 14.0 In. 189.87 Ac-ft 57,740
Water year 1957-58: Max 864 Min 14 Mean 96.4 Cfsm 16.9 In. 229.47 Ac-ft 69,770

Peak discharge (base, 950 cfs).--Nov. 23 (9:30 p.m.) 1,020 cfs (3.55 ft); Apr. 11 (11 p.m.) 1,350 cfs (3.90 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Aug. 24 to Sept. 30; discharge estimated on basis of weather records, recorded range in stage, and records for Fish Creek near Ketchikan.

700. Falls Creek near Ketchikan

Location.--Lat 55°36'50", long 131°20'55", on Revillagigedo Island, on left bank 1,100 ft upstream from mouth on east shore of Carroll Inlet, 1.1 miles downstream from Swan Lake, and 22 miles northeast of Ketchikan.

Drainage area.--36.5 sq mi.

Records available.--August 1916 to January 1926, September 1927 to December 1933, October 1946 to September 1958. Monthly discharge only for some periods, published in WSP 1372. Prior to January 1921, published as Swan Lake Outlet at Carroll Inlet.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map). Prior to December 1933, at site about 1,000 ft upstream at different datum.

Average discharge.--27 years (1916-25, 1927-33, 1946-58), 458 cfs (331,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,470 cfs Apr. 12 (gage height, 5.31 ft); minimum, 67 cfs Feb. 17, 18 (gage height, 2.08 ft).
1916-26, 1927-33, 1946-58: Maximum discharge, about 5,500 cfs Nov. 1, 1917; minimum daily, 19 cfs Feb. 21-25, 1925.

Remarks.--Records good. Swan Lake has an area of 1,050 acres.

Revisions (water years).--WSP 1372: 1918, drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	889	390	565	138	159	425	126	400	539	144	235	156
2	621	342	464	220	141	380	129	366	527	135	449	144
3	425	447	410	674	126	324	138	388	521	132	605	144
4	306	415	342	1,150	118	380	150	687	515	132	714	171
5	224	352	281	889	108	395	174	721	504	129	1,480	251
6	171	281	245	1,020	102	337	186	611	504	132	2,090	444
7	141	220	249	1,130	98	281	189	599	515	132	1,480	533
8	123	186	442	864	93	228	186	635	504	129	952	438
9	110	298	452	614	90	189	177	635	454	123	674	335
10	98	366	*366	442	85	168	186	563	416	118	575	260
11	95	306	311	333	83	144	524	498	388	112	460	208
12	156	302	281	261	81	135	2,120	432	345	112	*361	180
13	688	319	273	261	81	126	1,440	586	315	105	460	162
14	667	281	319	342	*81	118	980	1,250	305	102	812	156
15	464	242	294	486	73	112	875	1,940	273	100	1,590	159
16	366	201	253	997	71	105	680	1,320	239	98	1,190	231
17	294	253	228	1,150	67	100	545	903	235	95	770	264
18	231	277	198	816	67	95	438	707	243	93	539	361
19	183	253	174	786	102	93	*350	680	268	90	449	648
20	156	207	153	723	195	88	296	728	291	129	623	840
21	135	207	135	553	491	85	264	742	296	162	654	798
22	120	1,300	126	502	1,190	81	227	687	282	171	515	587
23	108	1,510	120	366	856	83	208	668	255	165	527	449
24	100	2,030	112	298	681	85	198	668	219	153	661	539
25	108	1,550	105	242	654	95	190	623	215	153	527	749
26	228	970	100	201	583	115	190	605	198	159	410	593
27	758	786	100	183	530	132	201	623	180	159	320	466
28	1,020	577	102	198	458	138	235	654	168	147	243	366
29	1,060	608	100	238	-	135	315	635	159	135	198	291
30	702	634	98	210	------	135	383	587	150	138	177	268
31	518	------	118	183	------	129	------	563	------	168	168	------
Total	11,265	16,110	7,516	16,470	7,464	5,436	12,300	21,704	10,023	4,052	20,908	11,191
Mean	363	537	242	531	267	175	410	700	334	131	674	373
Cfsm	9.95	14.7	6.63	14.5	7.32	4.79	11.2	19.2	9.15	3.59	18.5	10.2
In.	11.48	16.41	7.66	16.78	7.61	5.54	12.53	22.11	10.21	4.13	21.30	11.40
Ac-ft	22,340	31,950	14,910	32,670	14,800	10,780	24,400	43,050	19,880	8,040	41,470	22,200

Calendar year 1957: Max 2,030 Min 51 Mean 333 Cfsm 9.12 In. 123.86 Ac-ft 241,100
Water year 1957-58: Max 2,120 Min 67 Mean 396 Cfsm 10.8 In. 147.16 Ac-ft 286,500

Peak discharge (base, 1,800 cfs).--Nov. 22 (9:30 p.m.) 1,850 cfs (4.78 ft); Nov. 24 (10 p.m.) 2,230 cfs (5.11 ft); Apr. 12 (11:30 a.m.) 2,470 cfs(5.31 ft); May 15 (6 a.m.) 2,160 cfs (5.05 ft); Aug. 5 (10:30 p.m.) 2,220 cfs(5.10 ft).

* Discharge measurement made on this day.

720. Fish Creek near Ketchikan

Location.--Lat 55°23'30", long 131°11'40", on Revillagigedo Island, on right bank 50 ft upstream from outlet of Low Lake, 600 ft upstream from mouth at head of Thorne Arm, and 18 miles east of Ketchikan.

Drainage area.--32.1 sq mi, excludes that of Granite Lake drainage basin.

Records available.--May 1915 to October 1935, October 1938 to September 1958. Monthly discharge only for some periods, published in WSP 1372. Prior to January 1921, published as "near sea level, Revillagigedo Island."

Gage.--Water-stage recorder. Altitude of gage is 20 ft (by barometer). May 1915 to November 1935 at same site at different datum.

Average discharge.--40 years, 415 cfs (300,400 acre-ft per year).

Extremes.--Maximum discharge during year, 2,740 cfs Apr. 12 (gage height, 3.82 ft); minimum, 29 cfs July 19 (gage height, 0.54 ft).
1915-35, 1938-58: Maximum discharge, 4,600 cfs Nov. 1, 1917 (gage height, 5.33 ft, datum then in use), from rating curve extended above 1,400 cfs; minimum daily, 20 cfs Sept. 9, 10, 1928.

Remarks.--Records good. Lakes in the basin are as follows: Basin Lake (240 acres); Mirror Lake (1,350 acres); Third Lake (180 acres); Big Lakes (358 acres); and Low Lake (55 acres).

Revisions (water years).--WSP 1372: 1918.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,330	501	722	220	168	696	119	275	334	74	138	116
2	940	375	613	314	149	525	110	275	320	68	334	104
3	597	334	525	892	132	418	110	282	308	64	541	100
4	389	354	432	1,320	116	455	116	493	308	60	597	122
5	258	347	340	1,100	102	549	135	748	301	58	1,130	206
6	193	282	*294	1,080	97	455	156	645	294	54	2,110	425
7	149	220	361	1,130	87	375	168	605	288	53	1,850	645
8	119	180	621	970	82	288	168	670	275	52	1,160	525
9	100	211	662	730	78	231	160	713	258	48	757	361
10	87	320	525	517	76	193	168	589	236	47	645	264
11	80	334	403	361	70	164	516	470	211	46	517	198
12	92	308	340	275	68	138	2,380	455	198	43	375	160
13	334	308	375	389	62	122	2,000	597	175	41	*368	135
14	679	294	432	688	*56	107	1,390	1,170	164	39	629	129
15	557	248	389	784	54	94	1,130	1,610	153	35	1,380	126
16	403	202	327	1,200	54	87	820	1,290	138	33	1,140	149
17	314	294	314	1,440	53	80	621	892	129	32	739	168
18	242	354	258	1,180	74	76	455	645	122	30	493	275
19	188	308	206	1,140	153	72	347	533	122	29	382	541
20	153	242	171	960	220	66	*275	517	122	37	478	713
21	129	268	145	713	545	62	264	533	126	59	613	766
22	107	1,340	132	613	1,180	62	231	509	126	92	533	581
23	94	1,920	129	501	1,110	60	202	470	126	104	440	403
24	87	2,100	119	361	892	59	175	455	119	107	509	361
25	87	2,020	113	270	802	62	160	432	113	104	462	448
26	116	1,390	107	231	865	82	156	403	107	104	340	440
27	597	1,120	113	202	847	107	153	396	100	107	253	375
28	1,240	820	129	236	775	132	160	403	92	104	193	282
29	1,600	730	119	253	-	142	188	403	87	100	156	220
30	1,080	775	122	231	------	138	242	375	78	97	145	198
31	713	------	206	202	------	129	------	347	------	102	132	------
Total	13,054	18,499	9,744	20,503	8,967	6,226	13,275	18,200	5,530	2,023	19,539	9,536
Mean	421	617	314	661	320	201	442	587	184	65.3	630	318
Cfsm	13.1	19.2	9.78	20.6	9.97	6.26	13.8	18.3	5.73	2.03	19.6	9.91
In.	15.12	21.43	11.29	23.75	10.39	7.21	15.38	21.09	6.41	2.34	22.64	11.05
Ac-ft	25,890	36,690	19,330	40,670	17,790	12,350	26,330	36,100	10,970	4,010	38,760	18,910

Calendar year 1957: Max 2,100 Min 30 Mean 327 Cfsm 10.2 In. 138.12 Ac-ft 236,500
Water year 1957-58: Max 2,380 Min 29 Mean 398 Cfsm 12.4 In. 168.10 Ac-ft 287,800

Peak discharge (base, 1,800 cfs).--Nov. 24 (5 p.m.) 2,180 cfs (3.37 ft); Apr. 12 (4 p.m.) 2,740 cfs (3.82 ft); Aug. 6 (10 p.m.) 2,210 cfs (3.39 ft).

* Discharge measurement made on this day.

740. Ella Creek near Ketchikan

Location.--Lat 55°30'20", long 131°01'25", on Revillagigedo Island, on left bank 1 mile downstream from Lower Ella Lake, 1.5 miles upstream from mouth at Ella Bay, and 28 miles northeast of Ketchikan.

Drainage area.--19.7 sq mi.

Records available.--October 1927 to September 1938, August 1947 to September 1958 (discontinued). Monthly discharge only for some periods, published in WSP 1372.

Gage.--Water-stage recorder. Altitude of gage is 150 ft (by barometer). Prior to August 1947, at different datum.

Average discharge.--22 years, 244 cfs (176,600 acre-ft per year).

Extremes.--Maximum discharge during year, 890 cfs Nov. 24 (gage height, 4.10 ft); minimum, 10 cfs July 7 (gage height, 1.08 ft).
1927-38, 1947-58: Maximum discharge recorded, 1,720 cfs Dec. 7, 1930 (gage height, 5.60 ft, datum then in use); minimum, that of July 7, 1958.

Remarks.--Records good. Ella Lake, 1 mile above station, has an area of 1,930 acres.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	371	302	463	143	153	443	87	143	122	14	190	125
2	306	273	411	156	142	395	87	138	115	13	234	117
3	258	267	395	439	127	341	93	151	109	13	243	117
4	217	249	341	564	115	383	102	234	102	12	288	130
5	186	225	296	511	105	367	113	231	96	11	491	153
6	162	201	267	533	96	320	112	234	90	11	564	214
7	142	178	273	546	87	285	110	243	87	10	536	225
8	127	160	415	479	84	246	107	288	80	11	443	196
9	115	212	*344	423	78	214	105	299	73	15	383	173
10	104	203	292	352	77	188	127	270	67	20	348	155
11	101	180	261	299	71	164	529	249	60	26	292	142
12	117	180	243	252	*66	145	704	228	55	33	258	134
13	320	178	243	264	63	132	551	338	54	43	267	124
14	252	164	288	387	57	118	560	538	49	51	*348	120
15	222	155	255	479	54	109	551	700	44	57	471	118
16	201	143	228	596	51	99	483	574	40	67	399	130
17	183	186	217	628	48	92	427	467	39	76	330	132
18	162	196	193	564	57	84	363	399	36	84	279	164
19	145	178	173	614	127	77	313	348	34	93	264	240
20	132	160	153	578	176	70	273	316	32	134	327	334
21	118	164	138	503	299	62	258	285	30	143	334	302
22	107	610	130	439	515	60	*228	255	27	142	288	258
23	98	605	129	383	423	57	203	240	*24	136	282	228
24	90	815	120	324	415	56	180	220	24	138	279	249
25	93	765	113	270	431	62	166	196	23	143	246	258
26	167	700	110	240	499	83	155	180	22	151	212	231
27	306	668	112	206	511	98	147	171	19	151	186	214
28	448	551	118	220	475	102	147	160	18	147	164	188
29	459	511	112	222	-	99	151	147	17	147	147	169
30	399	495	115	198	------	94	149	136	15	155	140	169
31	352	------	149	176	------	92	------	130	------	164	134	------
Total	6,460	9,874	7,097	11,990	5,402	5,137	7,581	8,508	1,603	2,411	9,369	5,509
Mean	208	329	229	387	193	166	253	274	53.4	77.8	302	184
Cfsm	10.6	16.7	11.6	19.6	9.80	8.43	12.8	13.9	2.71	3.95	15.3	9.34
In.	12.20	18.64	13.40	22.63	10.20	9.70	14.31	16.06	3.03	4.55	17.69	10.40
Ac-ft	12,810	19,580	14,080	23,780	10,710	10,190	15,040	16,880	3,180	4,780	18,580	10,930

Calendar year 1957: Max 815 Min 22 Mean 177 Cfsm 8.98 In. 121.87 Ac-ft 128,000
Water year 1957-58: Max 815 Min 10 Mean 222 Cfsm 11.3 In. 152.81 Ac-ft 160,500

Peak discharge (base, 700 cfs).--Nov. 24 (4:30 p.m.) 890 cfs (4.10 ft); Jan. 16 (9:30 p.m.) 726 cfs (3.77 ft); Apr. 11 (3:30 p.m.) 865 cfs (4.05 ft); May 15 (5 a.m.) 755 cfs (3.84 ft).

* Discharge measurement made on this day.

760. Manzanita Creek near Ketchikan

Location.--Lat 55°36', long 130°59', on Revillagigedo Island, on right bank a quarter of a mile upstream from mouth at Manzanita Bay, East Behm Canal, 2 miles downstream from Manzanita Lake, and 31 miles northeast of Ketchikan.

Drainage area.--33.9 sq mi.

Records available.--October 1927 to September 1937, August 1947 to September 1958. Monthly discharge only for some periods, published in WSP 1372.

Gage.--Water-stage recorder. Altitude of gage is 140 ft (by barometer).

Average discharge.--21 years, 461 cfs (333,800 acre-ft per year)

Extremes.--Maximum discharge during year, 2,710 cfs Apr. 11 (gage height, 7.07 ft); minimum, 96 cfs July 19 (gage height, 1.56 ft).
1927-37, 1947-58: Maximum discharge, 3,870 cfs Oct. 13, 1949 (gage height, 8.19 ft), from rating curve extended above 1,600 cfs by logarithmic plotting; minimum not determined.
A discharge of 4,480 cfs occurred sometime during the period 1938-47 (gage height, 8.7 ft, from floodmark in well).

Remarks.--Records good. There are two lakes above gage, Manzanita Lake (1,610 acres) and January Lake on North Fork Manzanita Creek.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	528	468	855	235	312	520	181	399	483	166	328	302
2	402	456	730	268	295	486	189	384	471	160	302	285
3	348	531	714	792	275	444	201	426	456	155	260	308
4	318	462	601	626	255	556	211	626	444	149	430	345
5	295	426	538	628	240	480	240	548	435	143	895	474
6	272	384	495	686	227	429	221	545	426	141	1,010	594
7	252	350	556	835	217	399	215	576	417	136	784	465
8	238	330	802	629	207	363	211	664	396	131	640	399
9	225	495	584	576	199	338	209	640	378	128	573	363
10	213	441	510	501	191	318	240	594	363	124	556	335
11	207	369	483	447	183	298	1,240	548	348	122	489	312
12	258	387	456	408	175	278	1,640	507	330	117	453	295
13	647	366	468	453	*166	260	1,060	833	322	115	538	275
14	375	342	524	618	160	242	1,100	992	310	111	*812	278
15	340	322	432	714	155	227	1,020	1,280	295	108	1,040	278
16	335	305	396	1,040	149	217	870	1,010	280	106	752	312
17	308	390	381	936	144	209	766	860	275	102	646	285
18	285	345	348	885	154	199	666	793	268	99	570	390
19	265	320	325	958	260	189	608	752	265	97	562	468
20	245	292	305	860	292	179	570	748	252	137	784	618
21	233	350	288	726	587	173	*542	710	245	121	670	483
22	223	1,390	272	658	750	165	495	678	235	117	570	411
23	211	966	265	601	495	163	462	658	*227	109	622	378
24	203	1,540	248	528	576	168	435	626	219	110	601	548
25	217	1,400	235	471	573	187	414	594	215	137	520	489
26	390	1,210	225	435	650	215	399	587	205	127	468	432
27	679	1,060	221	402	615	205	399	580	197	115	429	402
28	865	895	219	438	576	199	414	566	187	108	390	363
29	858	986	209	414	-	191	426	534	181	105	360	340
30	562	948	207	363	------	185	420	520	172	145	345	387
31	510	------	260	335	------	179	------	501	------	181	325	------
Total	11,107	18,526	13,152	18,466	9,078	8,661	16,064	20,279	9,297	3,922	17,724	11,614
Mean	358	618	424	596	324	279	535	654	310	127	572	387
Cfsm	10.6	18.2	12.5	17.6	9.56	8.23	15.8	19.3	9.14	3.75	16.9	11.4
In.	12.18	20.32	14.43	20.26	9.96	9.50	17.62	22.25	10.20	4.30	19.44	12.74
Ac-ft	22,030	36,750	26,090	36,630	18,010	17,180	31,860	40,220	18,440	7,780	35,160	23,040

Calendar year 1957: Max 1,540 Min 106 Mean 368 Cfsm 10.9 In. 147.37 Ac-ft 266,500
Water year 1957-58: Max 1,640 Min 97 Mean 433 Cfsm 12.8 In. 173.20 Ac-ft 313,200

Peak discharge (base, 1,700 cfs).--Nov. 22 (2:30 a.m.) 1,980 cfs (6.20 ft); Nov. 24 (2 a.m.) 2,060 cfs (6.30 ft); Apr. 11 (9:30 p.m.) 2,710 cfs (7.07 ft).

* Discharge measurement made on this day.

940. Deer Lake Outlet near Port Alexander

Location.--Lat 56°31', long 134°40', on Baranof Island, on right bank at tidewater at Mist Cove, an eighth of a mile downstream from Deer Lake and 19 miles north of Port Alexander.

Drainage area.--9.2 sq mi, approximately.

Records available.--June 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is about 1 ft above mean sea level.

Average discharge.--7 years, 156 cfs (112,900 acre-ft per year).

Extremes.--Maximum discharge during year, 580 cfs Nov. 4 (gage height, 3.37 ft); minimum daily, 32 cfs Apr. 1.
1951-58: Maximum discharge, 642 cfs Oct. 22, 1953 (gage height, 3.47 ft); minimum, 9.4 cfs Mar. 23, 1956 (gage height, 0.73 ft), caused by temporary storage behind ice jam upstream.

Remarks.--Records fair. There are two lakes above gage, Deer Lake (968 acres), and Deer Upper Lake (139 acres).

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	123	189	203	91	140	134	32	90	151	83	65	91
2	119	288	196	122	131	129	33	90	154	80	65	85
3	114	518	188	154	124	127	33	91	151	78	64	85
4	107	554	178	171	115	129	34	101	148	76	72	94
5	101	464	168	181	*106	129	35	111	145	75	98	108
6	95	386	160	218	96	124	36	131	143	73	115	118
7	88	339	154	230	88	120	37	168	145	72	124	122
8	82	307	148	226	84	115	38	185	143	71	122	118
9	75	301	140	210	78	113	39	185	143	67	120	113
10	69	301	140	196	73	108	50	181	140	65	118	108
11	76	318	148	178	67	99	83	174	134	63	113	101
12	121	339	145	160	63	93	101	165	129	60	111	93
13	152	328	165	154	58	87	108	222	127	57	122	85
14	162	307	178	151	54	83	117	296	120	55	143	80
15	192	273	168	154	52	78	122	301	118	54	151	76
16	213	255	160	181	48	72	124	291	120	52	154	78
17	210	307	151	222	44	67	122	268	122	52	*151	74
18	196	291	140	259	43	62	118	242	120	51	148	68
19	181	259	131	275	42	59	117	226	*120	51	148	64
20	172	*238	122	259	44	53	113	222	122	59	151	64
21	164	230	115	234	63	51	108	222	122	62	148	61
22	152	234	113	226	85	48	101	218	118	64	143	58
23	140	222	109	214	85	44	96	203	117	64	162	65
24	130	234	104	196	96	43	91	196	113	62	162	106
25	140	255	98	181	102	40	*88	185	109	60	157	117
26	154	250	90	174	115	39	85	178	106	58	145	115
27	186	246	93	168	120	37	84	171	101	56	136	111
28	206	234	90	171	134	36	85	165	96	54	127	104
29	206	230	85	171	-	35	88	160	91	52	117	98
30	196	218	85	165	------	34	88	157	87	54	108	106
31	189	------	85	151	------	33	------	154	------	63	101	------
Total	4,511	8,915	4,250	5,841	2,350	2,421	2,406	5,749	3,755	1,943	3,861	2,766
Mean	146	297	137	188	83.9	78.1	80.2	185	125	62.7	125	92.2
Cfsm	15.9	32.3	14.9	20.4	9.12	8.49	8.72	20.1	13.6	6.82	13.6	10.0
In.	18.24	36.04	17.18	23.61	9.50	9.79	9.73	23.24	15.18	7.85	15.61	11.18
Ac-ft	8,950	17,680	8,430	11,590	4,660	4,800	4,770	11,400	7,450	3,850	7,660	5,490

Calendar year 1957: Max 554 Min 30 Mean 133 Cfsm 14.5 In. 195.74 Ac-ft 96,040
Water year 1957-58: Max 554 Min 32 Mean 134 Cfsm 14.6 In. 197.15 Ac-ft 96,730

Peak discharge (base, 350 cfs).--Nov. 4 (3 a.m.) 580 cfs (3.37 ft).

* Discharge measurement made on this day.

980. Baranof River at Baranof

Location.--Lat 57°05'15", long 134°50'30", on Baranof Island, on left bank at outlet of Baranof Lake, 1,500 ft upstream from mouth and town of Baranof.

Drainage area.--32.0 sq mi (revised).

Records available.--July 1915 to January 1928, October 1957 to September 1958. Monthly discharge only for some periods, published in WSP 1372.

Gage.--Water-stage recorder. Altitude of gage is 140 ft (from topographic map). Prior to Oct. 1, 1957, water-stage recorder at site 700 ft downstream at different datum.

Average discharge.--13 years (1915-27, 1957-58), 430 cfs (311,300 acre-ft per year).

Extremes.--Maximum discharge during year not determined, occurred during period prior to recorder record; minimum, 45 cfs Feb. 17 (gage height, 3.02 ft).
1915-28, 1957-58: Maximum discharge recorded, 4,170 cfs Sept. 24, 1922 (gage height, 5.8 ft, site and datum then in use), from rating curve extended above 1,800 cfs; minimum daily, 27 cfs Feb. 13, 14, 1916, Jan. 31, 1923.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Baranof Lake has an area of 698 acres.

Revisions (water years).--WSP 1372: 1918.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				79	112	192	63	547	953	421	646	
2			a220	126	99	166	76	547	1,020	442	484	
3				267	85	155	90	470	989	480	385	
4			208	328	76	200	103	474	935	533	421	
5			182	274	70	214	120	502	930	575	630	
6			168	379	*65	187	140	575	917	600	714	
7			161	666	61	162	148	714	1,010	592	670	
8			166	522	59	136	150	698	1,040	568	533	
9			155	346	56	119	161	610	935	530	424	
10			148	240	54	106	197	505	882	491	364	
11		a890	162	186	53	91	407	400	770	491	334	
12			166	153	51	80	463	334	702	516	325	
13			197	132	49	73	400	634	670	474	540	
14			229	122	48	68	376	806	614	484	722	
15			197	115	48	63	367	642	554	547	794	
	a420											a370
16			164	365	46	60	316	561	762	540	738	
17			140	862	45	57	260	505	838	502	*550	
18			123	798	46	55	217	435	*778	508		
19			107	622	47	54	189	446	838	508		
20			94	410	48	51	169	622	904	626		
21			83	282	68	50	155	798	976	666		
22		*277	88	238	144	48	146	766	850	600		
23		284	87	200	146	47	138	730	678	494		
24		358	84	168	152	46	133	746	586	446	a490	
25			80	145	158	47	*136	702	547	394		
26			75	128	168	48	150	702	530	376		
27		a330	84	128	189	50	192	718	477	418		
28			80	146	207	53	316	750	446	438		
29			78	158	-	54	505	734	424	428		
30			76	150	------	56	568	770	418	516		
31		------	75	131	------	58	------	850	------	758		------
Total	13,020	21,589	4,317	8,866	2,450	2,846	6,851	19,293	22,973	15,962	16,134	11,100
Mean	420	720	139	286	87.5	91.8	228	622	766	515	520	370
Cfsm	13.1	22.5	4.34	8.94	2.73	2.87	7.12	19.4	23.9	16.1	16.2	11.6
In.	15.13	25.09	5.02	10.30	2.85	3.31	7.96	22.42	26.70	18.55	18.75	12.90
Ac-ft	25,820	42,820	8,560	17,590	4,860	5,640	13,590	38,270	45,570	31,660	32,000	22,020

Calendar year 1957: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1957-58: Max - Min 45 Mean 398 Cfsm 12.4 In. 168.98 Ac-ft 288,400

Peak discharge (base, 2,000 cfs).--Nov. 2 or 3 (time and discharge unknown).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Takatz Creek near Baranof.

1000. Takatz Creek near Baranof

Location.--Lat 57°08'35", long 134°51'50", on Baranof Island, on left bank at tidewater at Takatz Bay, 2 miles downstream from Takatz Lake and 4 miles north of Baranof.

Drainage area.--17.5 sq mi.

Records available.--July 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is about 4 ft above mean sea level.

Average discharge.--7 years, 259 cfs (187,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3,600 cfs Nov. 2 (gage height, 5.24 ft), from rating curve extended above 660 cfs by logarithmic plotting; minimum not determined, occurred during period of no gage-height record.
1951-58: Maximum discharge, 4,820 cfs Sept. 14, 1952 (gage height, 5.79 ft), from rating curve extended above 660 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for period of no gage-height record, which are poor. Takatz Lake has an area of 425 acres.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	650	345	102	65	54			208	620	298	372	153
2	292	1,950	115	184	50			212	654	328	270	148
3	198	2,490	104	208	46			208	628	366	240	242
4	150	1,230	86	143	41			216	594	420	412	472
5	113	420	84	121				216	602	472	813	742
6	92	245	79	228				298	628	465	670	740
7	79	194	83	256				405	750	442	496	488
8	71	185	87	145				328	713	392	322	275
9	64	208	76	104				250	620	346	260	226
10	60	216	82	84				216	602	322	255	190
11	80	230	97	74				182	504	340	245	166
12	265	270	86	65				166	480	346	286	145
13	322	310	127	64			110	414	480	316	602	137
14	310	245	100	63				398	392	372	770	132
15	504	182	82	69		50		275	389	450	628	150
16	386	203	70	296	45			235	568	386	480	208
17	240	353	63	260				221	594	353	304	185
18	198	226	57	316				216	*544	392	*316	159
19	163	169	52	203				226	611	392	334	156
20	140	127	48	159				386	679	620	504	221
21	132	125	44	121				465	800	480	386	185
22	109	*137	53	113				420	594	360	334	175
23	93	119	55	95				398	420	298	620	162
24	84	206	53	80				405	353	280	520	602
25	182	230	51	71				353	353	255	322	480
26	353	194	49	68			*83	360	340	265	260	265
27	536	182	60	74			122	392	316	322	235	212
28	568	166	55	95			175	398	298	334	203	169
29	346	163	54	86	-		208	405	286	328	179	145
30	245	127	56	70	------		208	465	286	412	159	325
31	226	------	56	60	------		------	536	------	586	148	------
Total	7,251	11,447	2,266	4,040	1,271	1,550	3,546	9,873	15,698	11,738	11,945	8,055
Mean	234	382	73.1	130	45.4	50	118	318	523	379	385	268
Cfsm	13.4	21.8	4.18	7.43	2.59	2.86	6.74	18.2	29.9	21.7	22.0	15.3
In.	15.41	24.33	4.82	8.59	2.70	3.29	7.54	20.98	33.36	24.94	25.38	17.12
Ac-ft	14,380	22,700	4,490	8,010	2,520	3,070	7,030	19,580	31,140	23,280	23,690	15,980

Calendar year 1957: Max 2,830 Min 24 Mean 245 Cfsm 14.0 In. 189.85 Ac-ft 177,200
Water year 1957-58: Max 2,490 Min - Mean 243 Cfsm 13.9 In. 188.46 Ac-ft 175,900

Peak discharge (base, 2,300 cfs).--Nov. 2 (11 p.m.) 3,600 cfs (5.24 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 5 to Apr. 25; discharge estimated on basis of weather records and records for Baranof River at Baranof.

1020. Hasselborg Creek near Angoon

Location.--Lat 57°39'40", long 134°14'55", on Admiralty Island, on right bank at outlet of Hasselborg Lake, 16 miles northeast of Angoon.

Drainage area.--56.2 sq mi.

Records available.--June 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 295 ft (from topographic map).

Average discharge.--7 years, 306 cfs (221,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,260 cfs Nov. 4 (gage height, 3.02 ft); minimum, 53 cfs Mar. 24 (gage height, 1.36 ft).
1951-58: Maximum discharge, 2,400 cfs Oct. 23, 1953 (gage height, 3.78 ft), from rating curve extended above 780 cfs; minimum not determined.

Remarks.--Records good. Hasselborg Lake has an area of 3,500 acres.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	706	423	354	131	135	218	95	342	348	115	224	150
2	607	706	330	212	131	218	111	330	*354	111	229	131
3	479	1,220	318	423	115	246	131	324	354	107	218	131
4	381	1,200	282	530	103	282	155	360	342	103	270	175
5	300	980	252	515	95	264	180	395	330	103	437	270
6	246	758	224	631	92	246	196	479	330	99	530	402
7	212	607	218	794	86	212	207	560	324	99	552	522
8	180	522	202	706	77	a200	218	568	312	95	493	465
9	*155	508	180	599	71	a180	229	552	294	89	416	*409
10	140	458	190	486	71	a160	240	522	288	86	354	342
11	135	402	246	395	71	a150	354	479	276	89	300	294
12	185	360	264	324	65	140	623	423	258	89	258	258
13	252	318	278	294	62	123	647	530	240	86	240	224
14	276	282	288	252	59	115	639	689	229	83	258	207
15	312	252	276	240	59	103	639	714	218	83	288	196
16	342	224	248	300	59	95	591	664	240	80	294	202
17	318	246	224	354	59	89	538	591	264	77	276	202
18	282	258	207	367	62	83	472	522	252	80	252	185
19	240	246	180	360	62	77	416	472	240	86	246	165
20	212	224	155	360	68	74	354	508	234	155	276	165
21	185	224	140	330	89	68	312	552	240	*190	300	180
22	160	246	140	312	107	59	288	545	234	202	288	175
23	145	246	131	282	111	a55	*258	508	207	202	381	165
24	127	294	123	252	115	a53	252	493	185	190	402	246
25	127	388	123	224	123	a54	240	451	175	180	367	318
26	190	395	123	202	135	a60	234	402	165	175	318	306
27	395	402	135	185	170	a70	252	374	150	165	282	282
28	472	395	135	180	212	a75	288	360	135	155	252	258
29	493	430	135	175	-	a80	324	348	127	145	218	234
30	458	402	131	165	------	a85	342	342	119	150	190	270
31	430	------	123	155	------	92	------	348	------	175	165	------
Total	9,142	13,616	6,351	10,735	2,664	4,026	9,825	14,747	7,464	3,844	9,574	7,529
Mean	295	454	205	346	95.1	130	328	476	249	124	309	251
Cfsm	5.25	8.08	3.65	6.16	1.69	2.31	5.84	8.47	4.43	2.21	5.50	4.47
In.	6.05	9.01	4.20	7.10	1.76	2.66	6.50	9.76	4.94	2.54	6.34	4.98
Ac-ft	18,130	27,010	12,600	21,290	5,280	7,990	19,490	29,250	14,800	7,620	18,990	14,930

Calendar year 1957: Max 1,220 Min - Mean 266 Cfsm 4.73 In. 64.14 Ac-ft 192,200
Water year 1957-58: Max 1,220 Min 53 Mean 273 Cfsm 4.86 In. 65.84 Ac-ft 197,400

Peak discharge (base, 1,000 cfs).--Nov. 4 (2 a.m.) 1,260 cfs (3.02 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for stations on nearby streams.

1080. Pavlof River near Tenakee

Location.--Lat 57°50'30", long 135°02'10", on Chichagof Island, on left bank 140 ft upstream from falls at outlet of Pavlof Lake and 8 miles northeast of Tenakee.

Drainage area.--24.3 sq mi.

Records available.--June 1957 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is about 15 ft.

Extremes.--Maximum discharge during water year, 2,580 cfs Nov. 2 (gage height, 7.15 ft), from rating curve extended above 250 cfs by logarithmic plotting; minimum, 28 cfs Feb. 20 (gage height, 3.98 ft).
1957-58: Maximum discharge, that of Nov. 2, 1957; minimum, 22 cfs Aug. 16-18, 1957 (gage height, 3.97 ft).

Remarks.--Records good except those for period of ice effect, which are fair, and those for period of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	295	228	127	66	53	189	58			44	185	46
2	145	1,900	176	274	50	124	88			43	103	45
3	98	1,300	360	488	46	121	95			42	78	86
4	73	792	153	360	*41	242	106			42	177	617
5	63	416	100	164	38	145	106			43	228	310
6	58	210	82	635	38	88	106			43	224	547
7	54	138	78	876	35	68	112			42	176	315
8	50	194	78	295	34	57	112			41	109	153
9	48	242	70	168	35	54	112			40	82	103
10	45	214	80	118	34	50	141		85	38	68	82
11	46	145	300	88	33	48	584			41	60	70
12	85	138	176	75	32	44	382			41	54	61
13	112	153	181	73	31	44	232			40	53	57
14	103	103	202	70	31	44	232			38	53	54
15	172	82	160	78	30	43	340	230		38	90	52
16	141	75	118	348	30	41	265			37	153	52
17	95	207	88	1,020	29	40	181			35	90	50
18	73	322	73	464	29	40	134		*82	38	72	46
19	65	130	63	275	29	35	112		70	41	80	46
20	58	92	57	176	28	33	95		70	92	185	138
21	54	182	50	127	32	34	90		85	103	*127	82
22	50	275	55	106	55	34	90		72	68	90	60
23	48	124	54	127	57	33	90		60	58	324	60
24	45	*157	53	134	52	34	80		54	57	219	290
25	53	428	52	95	52	34	90		57	50	124	164
26	138	346	50	78	63	37	109		54	48	90	106
27	440	310	52	72	138	45	*168		52	45	78	90
28	320	342	53	72	299	46	219		48	43	68	73
29	228	360	50	90	-	45	206		48	44	60	66
30	157	181	50	80	------	48	172		45	191	54	157
31	185	------	53	60	------	49	------		------	377	50	------
Total	3,597	9,786	3,294	7,152	1,454	1,989	4,907	7,130	2,242	1,941	3,604	4,078
Mean	116	326	106	231	51.9	64.2	164	230	74.7	62.6	116	138
Cfsm	4.77	13.4	4.36	9.51	2.14	2.64	6.75	9.47	3.07	2.58	4.77	5.60
In.	5.51	14.98	5.04	10.95	2.23	3.04	7.51	10.91	3.43	2.97	5.52	6.24
Ac-ft	7,130	19,410	6,530	14,190	2,880	3,950	9,730	14,140	4,450	3,850	7,150	8,090

Calendar year 1957: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1957-58: Max 1,900 Min 28 Mean 140 Cfsm 5.76 In. 78.33 Ac-ft 101,500

Peak discharge (base, 1,000 cfs).--Nov. 2 (6 p.m.) 2,580 cfs (7.15 ft); Jan. 7 (5 a.m.) 1,320 cfs (6.18 ft); Jan. 17 (4 a.m.) 1,530 cfs (6.37 ft); Sept. 4 (1 p.m.) 1,040 cfs (5.92 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Feb. 1-22. No gage-height record May 1 to June 17; discharge estimated on basis of recorded range in stage, weather records, and records for Hasselborg Creek near Angoon.

2000. Gakona River at Gakona

Location.--Lat 62°18'05", long 145°18'20", near center of span on downstream side of bridge on Glenn Highway at Gakona, 500 ft upstream from mouth and 1.9 miles northeast of junction of Richardson and Glenn Highways.

Drainage area.--620 sq mi, approximately.

Records available.--Discharge: August to September 1948, October 1949 to September 1958. Chemical analyses: February 1952 to September 1954, October 1957 to September 1958. Water temperatures: October 1952 to September 1954. Sediment records: May 1953 to September 1958 (periodic); summer months only in 1956 and 1958.

Gage.--Wire-weight gage read once daily. Datum of gage is 1,403.03 ft above mean sea level. Aug. 8 to Sept. 13, 1948, staff gage at same site and datum.

Average discharge.--9 years, 926 cfs (670,400 acre-ft per year).

Extremes.--Maximum discharge during year, 3,500 cfs Aug. 4 (gage height, 5.45 ft, from graph based on gage readings); minimum not determined.
1948, 1949-58: Maximum discharge, 10,300 cfs Aug. 1, 1956 (gage height, 7.92 ft, from graph based on gage readings), from rating curve extended above 5,700 cfs by logarithmic plotting; no flow for part of day Mar. 25, 1953, caused by temporary storage behind ice jam upstream.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Some diurnal fluctuation caused by glacier melt at the source.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,500	523						220	980	1,810	3,100	736
2	1,400	534						230	980	1,940	3,220	914
3	1,300	550						240	1,080	2,120	3,380	914
4	1,200	550						260	1,080	2,510	3,240	830
5	1,100	496						290	1,040	2,680	2,500	770
6	980	450						330	1,150	2,840	1,980	710
7	900	430						420	2,210	2,680	1,930	719
8	840	374	200	190	140	110	93	560	1,870	2,520	2,040	694
9	810	351						740	2,210	2,330	2,200	648
10	780	332						1,000	1,330	2,040	2,600	556
11	760	313						1,100	1,700	1,880	2,050	575
12	*728	304						1,160	1,730	1,860	2,150	670
13	660	*304						*1,370	*1,660	1,800	1,790	587
14	612	304						1,430	1,660	1,870	1,830	627
15	612	304						1,430	1,400	1,900	1,980	556
16	539	310						1,400	1,300	1,600	1,940	512
17	*685	316						1,390	1,650	1,840	2,080	534
18	770	316			(*)			1,380	1,590	2,010	1,790	518
19	870	310						1,400	1,500	1,870	2,010	491
20	820	304						1,420	1,680	1,940	1,800	473
21	770	290						1,420	1,730	2,090	1,980	478
22	719	281			120			1,470	1,740	*2,210	1,730	438
23	685	270	170	180		100	120	1,540	1,870	1,970	1,590	430
24	612	259						1,540	1,760	2,010	1,300	464
25	648	249						1,540	1,760	1,570	*1,150	468
26	550	242						1,510	1,640	1,570	1,210	459
27	523	234						1,160	1,540	1,610	1,000	442
28	534	230						1,000	1,660	1,690	890	399
29	523	220	(*)		-			980	1,570	2,050	820	388
30	523	220			-------			980	1,700	3,140	780	406
31	523	-------			-------		-------	980	-------	3,180	770	-------
Total	24,476	10,170	5,720	5,730	3,660	3,250	3,195	31,890	46,770	65,130	58,830	17,406
Mean	790	339	185	185	131	105	106	1,029	1,559	2,101	1,898	580
Ac-ft	48,550	20,170	11,350	11,370	7,260	6,450	6,340	63,250	92,770	129,200	116,700	34,520

Calendar year 1957: Max 5,600 Min - Mean 1,313 Ac-ft 950,500
Water year 1957-58: Max 3,380 Min - Mean 757 Ac-ft 547,900

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 1-11, 13, Nov. 28 to Apr. 26 (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 2 discharge measurements, weather records, and records for stations on nearby streams. Stage-discharge relation affected by ice Nov. 9-27, Apr. 27 to May 10.

2000. GAKONA RIVER AT GAKONA --Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, Magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 17, 1957	a719	11	0.07	29	9.3	7.2	1.8	119	20	5.0	0.2	0.6	143	110	13	238	7.8	15
Dec. 28	170	15	.05	46	13	13	3.5	177	30	12	.2	.2	220	168	23	364	7.7	10
Feb. 11, 1958	140	13	.05	45	13	12	2.0	186	15	12	.0	.6	205	166	13	370	7.2	0
May 8	300	6.0	.19	19	6.7	4.6	1.5	82	10	4.5	.1	.4	93	75	8	147	7.2	80
June 3	a1,425	6.7	.12	27	3.8	3.1	1.2	84	18	2.5	.0	.1	104	83	14	178	6.7	10
June 23	a1,600	6.0	.14	26	12	3.8	1.7	90	40	3.5	.2	.0	137	114	40	222	7.3	0
Aug. 29	a844	6.9	.09	30	6.3	4.7	1.3	99	27	3.5	.2	.1	129	101	20	219	7.7	0
Sept. 24	a468	6.4	.02	33	10	8.0	1.5	114	33	8.0	.2	.2	157	124	30	272	7.1	10

a Discharge at time of sampling.

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Discharge (tons per day)
Oct. 17, 1957	719	78	151
Nov. 20	a304	55	45
May 5, 1958	a290	805	630
June 3	1,425	952	3,660
June 23	1,600	2,100	9,070
July 22	1,710	1,920	8,860
Aug. 29	844	225	513
Sept. 24	468	47	59

a Daily mean discharge.

Particle-size analyses of suspended sediment, water year October 1957 to September 1958

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment: Concentration of sample (ppm)	Suspended sediment: Concentration of suspension analyzed (ppm)	Suspended sediment: Percent finer than indicated size, in millimeters: 0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	Methods of analysis
May 5, 1958	12:30 p. m.	a290	--	805	617	3	5	8	14	23	49	68	91		100	--	BSWCM
June 3	1:30 p. m.	1,425	58	952	898	10	14	18	26	33	45	59	85		97	100	BSWCM
June 23	3:15 p. m.	1,600	56	2,100	2,090	25	35	51	64	71	75	81	92		99	100	PSWCM
July 22	10:10 a. m.	1,710	54	1,920	1,580	13	18	26	37	51	64	74	89		99	100	PSWCM
Aug. 29	3:50 p. m.	844	47	225	372	33	45	57	68	78	85	90	96		99	100	BSWCM

a Daily mean discharge.

2020. Tazlina River near Glennallen

Location.--Lat 62°03'20", long 145°25'35", in W½ sec.9, T.3 N., R.1 W., near center of span on downstream side of bridge on Richardson Highway, 2 miles upstream from mouth, 4 miles downstream from Moose Creek, and 5 miles southeast of Glennallen.

Drainage area.--2,670 sq mi, approximately.

Records available.--Discharge: August 1949 to September 1950, October 1951 to September 1958. Discharge measurements only in 1951.
Chemical analyses: February 1952 to to August 1953, December 1953 to September 1954, May to August 1956, October 1957 to September 1958.
Sediment records: May 1953 to September 1958 (periodic); summer months only 1956-58.

Gage.--Wire-weight gage read once daily. Datum of gage is 1,109.13 ft above mean sea level, adjustment of 1952.

Average discharge.--8 years, 4,269 cfs (3,091,000 acre-ft per year).

Extremes.--Maximum discharge during year, 17,300 cfs Aug. 2 (gage height, 8.24 ft, from graph based on gage readings); minimum daily, 221 cfs Apr. 18, 19.
1949-50, 1951-58: Maximum discharge, 47,000 cfs Aug. 31, 1955 (gage height, 12.25 ft, from graph based on gage readings); minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,240	5,130					250	658	2,980	9,480	16,900	7,580
2	6,810	4,760					250	810	3,100	10,000	17,200	7,340
3	6,500	4,720					250	945	3,520	10,300	16,000	7,220
4	5,960	4,480					250	1,080	3,840	10,600	15,400	7,040
5	5,560	4,200					240	1,170	4,040	19,900	15,000	6,680
6	5,190	3,920					240	1,250	4,340	11,500	14,700	6,400
7	4,860	3,720					240	1,310	4,640	12,100	14,800	6,050
8	4,590	3,490	1,100	740	370		240	1,330	4,980	12,400	14,200	5,870
9	4,340	3,250					240	1,350	5,840	12,800	14,600	5,580
10	4,070	3,080					240	1,350	*6,270	13,200	14,400	5,330
11	3,920	2,960					240	1,360	6,650	13,600	14,400	5,180
12	3,760	2,800					230	1,380	6,900	13,800	15,000	5,030
13	3,490	2,610					230	1,420	7,250	13,900	*15,100	4,910
14	3,400	2,430					232	1,480	7,400	14,000	15,000	4,760
15	3,310	2,250				280	226	1,540	7,370	13,100	14,200	*4,600
16	*3,180	2,170					226	1,700	7,460	*13,000	13,500	4,500
17	3,200	2,070					226	1,870	7,580	12,800	13,700	4,380
18	3,210	*2,000					221	*2,060	7,550	13,200	13,300	4,160
19	3,210	1,900					221	2,080	7,580	13,800	11,800	4,000
20	3,060	1,790					226	2,200	7,580	14,000	11,200	3,860
21	3,030	1,850				(*)	238	2,260	7,760	14,100	10,700	3,750
22	3,060	1,820			320		248	2,240	8,040	13,600	10,700	3,580
23	2,890	1,720	680	560			265	2,380	8,280	*14,600	10,300	3,430
24	2,770	1,600					277	2,480	8,490	14,400	10,200	3,280
25	2,760	1,540		(*)			307	2,530	8,660	13,600	10,400	3,220
26	2,640	1,440					332	2,530	8,740	13,200	10,200	3,100
27	2,540	1,400					364	2,590	8,980	12,700	9,600	2,980
28	2,560	1,300					418	2,650	9,120	13,200	9,440	2,800
29	2,550	1,300			-		490	2,680	9,400	13,900	8,980	2,680
30	2,960	1,300			-------		559	2,680	9,480	14,900	8,600	2,650
31	4,870	-------			-------		-------	2,720	-------	16,000	8,100	-------
Total	121,490	79,000	27,380	20,060	9,710	8,680	8,216	56,083	203,820	402,680	397,620	141,940
Mean	3,919	2,633	883	647	347	280	274	1,809	6,794	12,990	12,830	4,731
Ac-ft	241,000	156,700	54,310	39,790	19,260	17,220	16,300	111,200	404,300	798,700	788,700	281,500

Calendar year 1957: Max 35,200 Min - Mean 5,632 Ac-ft 4,077,000
Water year 1957-58: Max 17,200 Min 221 Mean 4,046 Ac-ft 2,929,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13 to May 17 (no gage-height record Nov. 19, Nov. 27 to Apr. 13; discharge estimated on basis of 2 discharge measurements and weather records).

2020. TAZLINA RIVER NEAR GLENNALLEN--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, Magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 14, 1957	3,400	5.6	0.10	18	3.0	3.2	0.9	61	14	0.5	0.1	0.3	76	58	8	126	7.5	25
Jan. 6, 1958	740	3.4	.09	21	1.9	3.6	1.0	64	12	3.0	.0	.7	79	60	8	137	7.1	15
Feb. 10	370	5.0	.08	22	3.6	5.0	1.3	67	14	7.0	.0	.3	91	70	15	147	7.0	0
May 8	a 1,350	4.9	--	17	5.7	3.8	1.5	73	9.0	3.5	.1	.2	82	66	6	134	7.1	120
June 5	a 4,040	3.2	.14	19	2.9	2.5	.6	55	14	3.0	.2	.1	73	60	14	121	6.5	10
June 25	a 7,860	3.5	.18	18	1.6	2.0	.7	54	12	1.0	.1	.3	66	52	8	114	7.6	--
Aug. 29	a 9,160	6.9	.28	16	3.5	2.7	1.4	57	13	2.5	.0	.2	74	54	8	115	7.5	30
Sept. 25	a 3,220	3.4	.04	19	2.9	3.9	.5	51	18	5.5	.0	.1	78	60	18	133	6.6	10

a Discharge at time of sampling.

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Water discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Discharge (tons per day)
Oct. 17, 1957	4,660	88	1,110
Nov. 18	a 2,000	52	281
May 8, 1958	a 1,350	448	1,630
June 5	4,040	296	3,230
June 25	7,860	164	3,480
July 22	13,000	186	6,530
Aug. 29	9,160	84	2,080
Sept. 25	3,220	48	417

a Daily mean discharge.

Particle-size analyses of suspended sediment, water year October 1957 to September 1958

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment: Concentration of sample (ppm)	Suspended sediment: Concentration of suspension analyzed (ppm)	Suspended sediment: Percent finer than indicated size, in millimeters: 0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	Methods of analysis
May 8, 1958		1,350		448	635	45	54	64	83	94	99		100				BSWCM
June 5		4,040		296	600	20	25	26	42	59	86	92	97		99	100	BSWCM

2060. Klutina River at Copper Center

Location.--Lat 61°57'10", long 145°18'20", in SW¼ sec.18, T.2 N., R.1 E., near left bank on downstream side of bridge on Richardson Highway, 0.7 mile south of Copper Center, three-quarters of a mile upstream from mouth, and 24 miles downstream from Klutina Lake.

Drainage area.--880 sq mi, approximately.

Records available.--Discharge: May to August 1908 (gage heights only), June to October 1913, August 1949 to September 1958.
Chemical analyses: March 1952 to September 1954, May to August 1956, October 1957 to September 1958.
Water temperatures: October 1952 to September 1953.
Sediment records: May 1953 to September 1958 (periodic); summer months only 1956-58.

Gage.--Wire-weight gage read once daily. Datum of gage is 1,011.26 ft above mean sea level. May 19 to Aug. 31, 1908, and June 17 to Oct. 31, 1913, staff gages at sites a quarter of a mile downstream at different datums.

Average discharge.--9 years (1949-58), 1,733 cfs (1,255,000 acre-ft per year).

Extremes.--Maximum discharge observed during year, 6,510 cfs June 12 (gage height, 7.66 ft); maximum gage height observed, 9.79 ft Apr. 14 (backwater from ice); minimum discharge not determined.
1913, 1949-58: Maximum discharge observed, 9,040 cfs June 29, 1953 (gage height, 9.24 ft); maximum gage height observed, 15.55 ft May 9, 1953 (backwater from ice); minimum discharge not determined.

Remarks.--Records fair except those for period of ice effect, which are poor.

Revisions.--WSP 1372: Drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,760	1,550						390	1,710	5,430	6,060	3,010
2	3,560	1,540						420	1,870	5,530	6,040	2,920
3	3,360	1,480						450	2,550	5,550	5,820	2,870
4	3,280	1,420						470	2,690	5,600	5,770	2,720
5	3,190	1,400						500	3,060	5,410	5,620	2,530
6	2,880	1,350						515	3,800	5,480	5,500	2,520
7	2,560	1,280						539	4,650	5,500	5,380	2,470
8	2,400	1,230	610	410	270			557	5,190	4,520	5,260	2,340
9	2,120	1,240						575	6,040	4,140	4,900	2,260
10	2,020	1,210						587	*6,400	4,360	4,860	2,160
							210					
11	2,020	1,160						611	6,450	4,540	4,720	2,150
12	1,900	1,110						635	6,510	4,670	4,760	2,010
13	1,870	1,080						665	6,190	4,140	*5,480	1,820
14	1,810	1,040					(*)	704	6,060	4,060	5,340	1,720
15	1,750	1,020						762	5,820	3,970	5,100	1,670
						230						
16	*1,810	986						802	5,650	4,560	4,980	1,630
17	1,680	970						854	5,500	*4,930	4,780	*1,650
18	1,620	951						*951	5,260	5,170	4,450	1,580
19	1,590	965				(*)		881	4,430	5,310	3,860	1,540
20	1,580	*986						923	4,860	5,400	3,640	1,530
21	1,600	944						923	5,100	5,360	3,480	1,470
22	1,560	923			250			1,160	5,410	5,220	3,260	1,450
23	1,590	902		(*)				1,180	5,260	*5,190	3,360	1,410
24	1,630	870	380	320				1,290	5,360	4,980	3,500	1,390
25	1,660	840						1,400	5,380	5,070	3,680	1,370
							250					
26	1,720	814						1,370	5,550	5,020	3,760	1,300
27	1,760	802						1,390	5,410	5,140	3,600	1,300
28	1,700	782						1,340	5,340	5,220	3,380	1,260
29	1,630	762			-			1,400	5,480	5,260	3,150	1,210
30	1,610	750			-------			1,480	5,530	5,670	3,080	1,190
31	1,550	-------			-------		-------	1,520	-------	5,860	3,000	-------
Total	64,770	32,357	15,230	11,270	7,300	7,130	6,700	27,244	148,510	156,260	139,570	56,450
Mean	2,089	1,079	491	364	261	230	223	879	4,950	5,041	4,502	1,882
Ac-ft	128,500	64,180	30,210	22,350	14,480	14,140	13,290	54,040	294,600	309,900	276,800	112,000

Calendar year 1957: Max 8,030 Min - Mean 2,238 Ac-ft 1,620,000
Water year 1957-58: Max 6,510 Min - Mean 1,843 Ac-ft 1,334,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 22 to May 22 (no gage-height record Nov. 17, 24, Dec. 8, 15, 18, Dec. 20 to Apr. 30; discharge estimated on basis of 3 discharge measurements, weather records, and records for Tazlina River near Glennallen).

2060. KLUTINA RIVER AT COPPER CENTER--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, Magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 16, 1957	a 1,810	4.9	0.11	14	1.1	1.3	0.9	44	7.0	0.0	0.0	0.4	52	40	4	89	7.4	35
Nov. 20	a 1,100	--	--	14	1.8	2.0	1.0	49	7.4	1.0	--	--	--	42	2	96	7.5	20
Jan. 6, 1958	410	4.6	.12	16	2.1	1.8	.8	53	6.0	1.0	.0	.3	59	48	5	101	7.4	20
Feb. 10	270	5.2	.14	17	2.4	3.5	1.5	55	9.0	3.5	.0	.4	70	52	8	112	6.4	10
May 8	a 593	5.4	.09	15	3.1	1.8	.8	56	7.0	.5	.0	.3	b 74	50	4	107	7.1	40
June 5	a 3,060	4.2	.14	14	2.3	1.5	.6	42	11.0	1.5	.0	.2	56	44	10	90	6.3	5
June 25	a 5,960	4.0	.54	14	1.8	1.2	.7	43	14.0	.5	.0	.3	58	42	8	88	6.8	--
Aug. 26	a 3,480	3.3	.05	13	3.9	1.3	.7	47	10.0	3.0	.0	.1	58	48	10	91	7.3	30
Sept. 22	a 1,650	3.8	.04	13	2.7	2.2	.5	38	11.0	2.5	.2	.1	55	44	12	95	6.4	10

a Discharge at time of sampling.
b Residue on evaporation at 180° C.

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Discharge (tons per day)
Oct. 16, 1957	a 1,810	73	357
Nov. 20	1,100	51	151
May 8, 1958	593	110	176
June 5	a 3,060	236	1,950
June 25	5,960	86	1,380
July 22	5,600	84	1,270
Aug. 26	3,480	56	526
Sept. 22	1,650	41	183

a Daily mean discharge.

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment: Concentration of sample (ppm)	Suspended sediment: Concentration of suspension analyzed (ppm)	Suspended sediment: Percent finer than indicated size, in millimeters: 0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	Methods of analysis
June 5, 1958		3,060	52	236	347	31	35	42	48	60	76	85	92		96	100	BSWCM

2080. Tonsina River at Tonsina

Location.--Lat 61°39'50", long 145°10'50", near left bank on upstream side of bridge on Richardson Highway at Tonsina, 0.4 mile upstream from Bernard Creek and 0.6 mile upstream from Squirrel Creek. Prior to Oct. 16, 1957, at site 200 ft upstream.

Drainage area.--420 sq mi, approximately.

Records available.--Discharge: May 1950 to December 1954, January to September 1955 (fragmentary), October 1955 to September 1958.
Chemical analyses: February 1952 to September 1953, January to September 1954, May to August 1956, October 1957 to September 1958.
Water temperatures: October 1952 to September 1953.
Sediment records: May 1953 to September 1958 (periodic); summer months only 1956-58.

Gage.--Wire-weight gage read once daily. Altitude of gage is 1,500 ft (from topographic map). Prior to Oct. 16, 1957, at site 200 ft upstream at same datum.

Average discharge.--7 years (1950-54, 1955-58), 927 cfs (671,100 acre-ft per year).

Extremes.--Maximum discharge observed during year, 7,260 cfs June 10 (gage height, 5.15 ft); minimum not determined.
1950-54, 1955-58: Maximum discharge, 7,910 cfs June 8, 1957 (gage height, 7.00 ft, site then in use); minimum not determined.

Remarks.--Records good except those for periods of ice effect or shifting control, which are fair, and those for periods of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,810	831								3,800	2,390	716
2	1,700	809								3,700	2,140	1,050
3	1,620	854								3,600	2,080	757
4	1,550	757								3,500	1,870	716
5	1,500	733							3,000	3,400	2,010	704
6	1,400	693								3,300	2,190	606
7	1,300	585								3,100	2,080	597
8	1,200	561	230	190	120	110	76			2,900	2,190	673
9	1,240	538								2,700	2,210	704
10	1,160	546						270	*7,180	2,600	2,140	673
11	1,150	527								2,500	2,010	662
12	1,110	496								2,400	1,710	633
13	1,030	476								2,400	1,700	585
14	992	460					(*)			2,400	1,310	633
15	884	b448								2,400	*1,630	624
16	*577	b429								2,500	1,240	*620
17	750	b414								2,800	1,380	615
18	854	b402						*517		*2,570	1,010	606
19	839	b420				(*)				2,410	862	606
20	846	*b370							4,600	2,510	739	500
21	733	350								2,410	704	510
22	851	340			110					2,370	757	531
23	918	330		(*)			98			2,280	739	538
24	901	320	170	160		100				*2,260	936	527
25	846	310						800		1,650	1,080	520
26	831	300								1,440	824	520
27	862	290								1,340	662	510
28	839	280								1,960	790	503
29	846	280			-					2,260	854	486
30	824	270			-------					2,390	647	486
31	831	-------			-------		-------		-------	2,750	642	-------
Total	32,774	14,409	6,170	5,410	3,230	3,250	2,610	15,507	126,180	80,400	43,526	18,411
Mean	1,057	480	199	175	115	105	87.0	500	4,206	2,594	1,404	614
Ac-ft	65,010	28,580	12,240	10,730	6,410	6,450	5,180	30,760	250,300	159,500	86,330	36,520

Calendar year 1957: Max 7,580 Min - Mean 1,109 Ac-ft 802,600
Water year 1957-58: Max - Min - Mean 964 Ac-ft 698,000

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Nov. 21 to July 17 except on occasional days (stage-discharge relation affected by ice during part of period); discharge estimated on basis of 7 discharge measurements, weather records, and records for stations on nearby streams. Shifting-control method used Oct. 1 to Nov. 15.

2080. TONSINA RIVER AT TONSINA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 16, 1957	a 577	5.0	0.09	10	2.6	1.3	0.6	37	7.0	1.0	0.0	0.4	46	36	5	73	6.9	15
Feb. 10	a 120	8.4	.08	15	3.6	3.2	.8	54	7.0	5.0	.0	1.5	72	52	8	108	6.4	0
May 8	a 270	6.1	.15	13	1.7	1.2	.7	45	5.0	.5	.0	.4	b 58	40	2	82	6.6	35
June 5	a 3,000	4.0	.09	8.7	1.7	.8	.4	24	8.0	1.5	.2	.1	37	28	9	59	6.0	0
Jnne 25	a 2,530	4.3	.41	9.4	.8	.9	.5	26	6.0	1.5	.1	.2	37	26	5	63	6.2	--
Aug. 26	a 1,160	4.6	.05	9.5	1.7	1.2	.6	32	4.0	2.0	.0	.2	40	30	4	65	6.9	30
Sept. 22	a 556	4.4	.04	9.9	2.6	2.0	.6	38	6.0	2.5	.2	.2	48	35	4	76	7.2	10

a Discharge at time of sampling.

b Residue on evaporation at 180°C.

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Discharge (tons per day)
Oct. 16, 1957	577	66	103
Nov. 20	370	34	34
May 8, 1958	a 270	36	26
June 5	3,000	116	940
June 25	2,530	37	253
July 22	2,280	38	234
Aug. 26	1,160	34	106
Sept. 22	556	35	52

a Daily mean discharge.

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment: Concentration of sample (ppm)	Suspended sediment: Concentration of suspension analyzed (ppm)	Suspended sediment: Percent finer than indicated size, in millimeters: 0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	Methods of analysis
June 5, 1958		3,000		116	253		26	27	32	41	70	78	88		94		BSWCM

2120. Copper River near Chitina

Location.--Lat 61°28', long 144°28', on right bank at head of Woods Canyon, half a mile downstream from Taral Creek and abandoned Indian village of Taral, 2¼ miles upstream from Tenas Creek, and 3⅝ miles south of Chitina.

Drainage area.--20,600 sq mi, approximately.

Records available.--Discharge: July to September 1950, May to November 1952, October 1955 to September 1958.
Chemical analyses: June to November 1950, January 1954 to September 1957.
Water temperatures: June to September 1957.
Sediment records: January 1954 to September 1956 (periodic), June to September 1957 (daily), summer months only 1955-57.

Gage.--Water-stage recorder. Altitude of gage is 400 ft (from topographic map). Prior to June 2, 1952, staff gage at site a quarter of a mile upstream at datum 1.4 ft higher. June 2 to Nov. 30, 1952, water-stage recorder at same site and datum.

Extremes.--Maximum discharge recorded during year, 172,000 cfs June 10 (gage height, 22.52 ft); minimum not determined.
1950, 1952, 1955-58: Maximum discharge recorded, that of June 10, 1958; minimum not determined.
Maximum stage known since 1950, 28.3 ft in July 1951, at present datum, from flood-marks (discharge, 220,000 cfs). Minimum discharge observed, 3,830 cfs Feb. 25, 1954 (discharge measurement).

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Some diurnal fluctuation caused by glacier melt at the source.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64,500								41,000		140,000	56,000
2	55,100								43,000		140,000	58,000
3	49,400								51,000		130,000	57,000
4	45,200								55,000		130,000	54,000
5	41,400								60,000		119,000	51,000
		22,000						14,000				
6	38,100								72,000		124,000	49,000
7	35,100								93,000		140,000	47,000
8	33,100		7,800	7,600					110,000		135,000	47,000
9	31,200								*137,000		138,000	44,000
10	29,600								143,000		133,000	43,000
							3,900					
11	28,700								155,000		126,000	42,000
12	27,700								130,000	130,000	123,000	41,000
13	26,200								121,000		123,000	39,000
14	24,600								106,000		*118,000	39,000
15	*23,200	14,000							102,000		110,000	37,000
					5,200	4,300		26,000				
16	b22,000								95,800		104,000	*36,600
17	b23,000								97,000		97,700	36,000
18	b23,000								95,000		93,000	34,500
19	b23,000	*12,000							94,600		87,000	32,900
20	23,000					(*)			114,000		82,000	30,800
21	22,000								123,000		78,000	28,600
22	22,000								134,000		75,000	26,200
23	21,000			6,800					127,000		74,000	23,600
24	21,000		6,600	(*)					125,000	*132,000	73,000	22,800
25	21,000	9,800							116,000		75,000	22,200
							5,000	36,000				
26	20,000								110,000		74,000	21,500
27	20,000								110,000	120,000	70,000	20,400
28	20,000								120,000		68,000	19,700
29	19,000				-				120,000		65,000	18,600
30	20,000				-------				120,000		62,000	17,700
31	27,000	-------			-------		-------		-------		59,000	-------
Total	900,100	451,800	222,600	222,800	145,600	133,300	128,000	796,000	‡3,120.4	‡3,962	‡3,165.7	‡1,096.1
Mean	29,040	15,060	7,181	7,187	5,200	4,300	4,267	25,680	104,000	127,800	102,100	36,540
Ac-ft	‡1,785	896,100	441,500	441,900	288,800	264,400	253,900	‡1,579	‡6,189	‡7,859	‡6,279	‡2,174

Calendar year 1957: Max 147,000 Min - Mean 47,150 Ac-ft 34,130,000
Water year 1957-58: Max 155,000 Min - Mean 39,300 Ac-ft 28,450,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Oct. 20 to Nov. 18, Nov. 20 to June 8 (stage-discharge relation affected by ice during most of period), June 26 to July 23, July 25 to Aug. 4, Aug. 18 to Sept. 15; discharge estimated on basis of 6 discharge measurements, weather records, and records for stations on tributary streams.

2160. Power Creek near Cordova

Location.--Lat 60°35'15", long 145°37'05", on left bank at old bridge site, 1 mile upstream from Eyak Lake and 5½ miles northeast of Cordova.

Drainage area.--20.5 sq mi.

Records available.--July to November 1913 (fragmentary), August 1947 to September 1958.

Gage.--Water-stage recorder. Datum of gage is 33.5 ft above mean sea level (river-profile survey). July to November 1913, staff gage half a mile upstream at different datum.

Average discharge.--11 years, 258 cfs (186,800 acre-ft per year).

Extremes.--Maximum discharge during year, 5,250 cfs July 27 (gage height, 7.50 ft), from rating curve extended above 1,450 cfs by logarithmic plotting; minimum, 33 cfs Mar. 30 (gage height, 1.56 ft).
1947-58: Maximum discharge recorded, 5,540 cfs Sept. 25, 1949 (gage height, 7.65 ft), from rating curve extended above 1,450 cfs by logarithmic plotting; minimum recorded, 13 cfs Apr. 29, 1950 (gage height, 1.50 ft), but may have been less during periods of no gage-height record.

Remarks.--Records good except those for period of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	334	485	111	45	57	57	49	154	470	378	562	251
2	266	586	106	46	56	79	52	187	485	400	1,110	572
3	221	400	102	45	53	69	48	275	*485	440	1,960	506
4	194	1,880	95	45	50	64	45	310	455	450	1,180	322
5	171	610	97	54	50	58	43	254	440	440	798	292
6	154	415	101	118	49	55	43	245	568	445	580	263
7	141	322	93	580	49	50	44	306	806	415	475	257
8	128	282	85	318	46	49	45	289	774	382	455	227
9	135	310	80	171	48	49	46	218	610	410	886	212
10	150	289	76	123	45	48	48	182	470	894	502	194
11	318	296	71	97	44	45	59	164	455	*624	405	180
12	314	251	70	89	43	47	61	168	538	405	592	192
13	182	212	68	83	42	44	60	171	490	655	410	187
14	160	192	66	78	42	43	59	189	538	624	*538	182
15	269	175	66	78	41	42	58	227	485	460	400	182
16	1,550	202	64	90	41	42	61	346	1,540	2,480	310	182
17	1,380	263	63	93	41	40	62	378	814	1,880	272	158
18	*1,310	197	62	197	40	40	62	272	538	1,610	254	142
19	550	184	62	210	40	39	62	245	586	1,230	272	228
20	326	309	60	133	42	38	64	251	715	814	254	156
21	415	745	57	102	51	37	64	410	1,230	624	480	125
22	298	251	54	89	45	37	63	390	955	1,420	423	156
23	218	184	54	85	46	36	62	366	538	750	1,160	542
24	192	156	53	77	43	*37	*62	470	490	838	2,390	350
25	166	141	52	73	42	35	62	538	460	624	1,690	210
26	146	*162	49	69	42	34	63	395	420	562	758	a400
27	189	146	49	*85	42	34	75	330	410	3,340	470	a300
28	813	135	45	64	49	34	115	318	415	2,560	395	a220
29	1,040	130	45	64	-	34	164	334	390	1,180	334	a130
30	405	118	45	62	------	33	152	400	370	750	292	a350
31	282	------	45	61	------	34	------	440	------	604	263	------
Total	12,415	10,028	2,146	3,504	1,279	1,383	1,953	9,222	17,940	28,688	20,870	7,668
Mean	400	334	69.2	113	45.7	44.6	65.1	297	598	925	673	256
Cfsm	19.5	16.3	3.38	5.51	2.23	2.18	3.18	14.5	29.2	45.1	32.8	12.5
In.	22.52	18.19	3.89	6.36	2.32	2.51	3.54	16.73	32.55	52.04	37.86	13.91
Ac-ft	24,620	19,890	4,260	6,950	2,540	2,740	3,870	18,290	35,580	56,900	41,400	15,210

Calendar year 1957: Max 2,540 Min - Mean 287 Cfsm 14.0 In. 190.02 Ac-ft 207,800
Water year 1957-58: Max 3,340 Min 33 Mean 321 Cfsm 15.7 In. 212.42 Ac-ft 232,200

Peak discharge (base, 2,000 cfs).--Oct. 16 (12 p.m.) 2,810 cfs (5.95 ft); Nov. 4 (3:30 a.m.) 4,000 cfs (6.70 ft); June 16 (2:30 p.m.) 2,080 cfs (5.30 ft); July 16 (11 a.m.) 3,450 cfs (6.33 ft); July 18 (3 p.m.) 2,120 cfs (5.33 ft); July 27 (6 p.m.) 5,250 cfs (7.50 ft); Aug. 3 (8 a.m.) 2,410 cfs (5.71 ft); Aug. 24 (7 a.m.) 3,060 cfs (6.10 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records.

2390. Bradley River near Homer

Location.--Lat 59°45'25", long 150°51'00", on right bank about 800 ft downstream from Bradley Lake Outlet, 3½ miles upstream from unnamed tributary, and 26 miles northeast of Homer.

Drainage area.--54.0 sq mi.

Records available.--July to August 1955, October 1957 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 1,050 ft (from topographic map). July 13-22, 1955, staff gage at site 1 mile upstream, and July 23 to Aug. 5, 1955, staff gage at site 3 miles upstream at different datum.

Extremes.--1955: Maximum discharge observed during period July to August, 1,350 cfs July 13 (gage height, 1.08 ft); minimum observed, 820 cfs Aug. 4 (gage height, 0.27 ft); site and datum then in use.
1957-58: Maximum discharge during water year, 3,470 cfs Aug. 13 (gage height, 8.20 ft); minimum not determined.

Remarks.--Records good except those for the period July to August 1955, those during period of shifting control, and those above 1,100 cfs, which are fair, and those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, 1955

Day	July	Aug.	Day	July	Aug.	Day	July	Aug.	Day	July	Aug.	Day	July	Aug.
1	-	1,040	7	-	-	13	*1,330	-	19	996	-	25	1,180	-
2	-	*1,000	8	-	-	14	1,200	-	20	1,060	-	26	1,070	-
3	-	892	9	-	-	15	1,180	-	21	1,230	-	27	1,010	-
4	-	827	10	-	-	16	1,180	-	22	1,290	-	28	951	-
5	-	834	11	-	-	17	1,140	-	23	1,280	-	29	892	-
6	-	-	12	-	-	18	1,060	-	24	1,260	-	30	892	-
												31	938	-

* Discharge measurement made on this day.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	287	664	205						578	930	885	466
2	245	800	186				(*)		625	975	875	462
3	211	1,380	175						722	1,010	860	466
4	188	1,230	169						*750	1,060	*865	439
5	164	920	161				46	290	800	1,300	950	398
6	151	740	154		(*)				930	1,360	1,010	358
7	141	608	146						1,100	1,250	980	338
8	130	518	141	82	49				1,220	1,160	1,000	319
9	126	439	148						1,190	1,080	1,000	312
10	120	378	133						1,050	*1,090	970	303
11	118	348	128						970	1,070	1,040	303
12	116	341	123						975	1,010	2,110	325
13	115	319	118						980	1,040	3,350	*338
14	113	287	113						930	1,080	3,110	344
15	116	269	110						825	1,010	2,280	348
16	180	364	100			32	66	b400	750	985	1,600	348
17	251	497	96						709	1,130	1,220	331
18	671	485	90						696	1,220	1,020	303
19	1,660	522	85						790	1,170	875	284
20	1,440	621	81						1,250	1,080	776	242
21	1,850	621	78						2,390	1,010	950	202
22	3,000	493	75		33				2,890	1,010	1,670	225
23	2,270	392	72						2,330	1,150	1,710	462
24	1,480	*328	71	76					1,710	1,220	1,940	477
25	1,000	281	70						1,330	1,060	1,660	424
26	718	275	70				110	b470	1,130	965	1,300	392
27	535	254	70						1,010	1,290	1,010	381
28	696	245	70						980	1,520	815	328
29	970	222	70		-				940	1,410	682	315
30	880	205	70		------				920	1,150	586	420
31	736	------	70		------		------		------	975	522	------
Total	20,656	15,046	3,448	2,446	1,164	992	2,220	12,070	33,470	34,770	39,621	10,653
Mean	666	502	111	78.9	41.6	32.0	74.0	389	1,116	1,122	1,278	355
Cfsm	12.3	9.30	2.06	1.46	0.770	0.593	1.37	7.20	20.7	20.8	23.7	6.57
In.	14.23	10.36	2.37	1.68	0.80	0.68	1.53	8.31	23.05	23.95	27.29	7.34
Ac-ft	40,970	29,840	6,840	4,850	2,310	1,970	4,400	23,940	66,390	68,970	78,590	21,130

Calendar year 1957: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1957-58: Max 3,350 Min - Mean 484 Cfsm 8.96 In. 121.59 Ac-ft 350,200

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Dec. 15 to May 10 (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 2 discharge measurements, weather records, and records for Cooper Creek at mouth near Cooper Landing. Shifting-control method used Oct. 1-18, 27, Nov. 8-19, Nov. 22 to Dec. 14, June 1.

2400. Anchor River at Anchor Point

Location.--Lat 59°46'10", long 151°50'00", in SE¼ sec.4, T.5 S., R.15 W., near right bank on downstream side of Sterling highway bridge at Anchor Point, 0.1 mile downstream from North Fork and 1 mile upstream from mouth.

Drainage area.--226 sq mi.

Records available.--Discharge: June 1953 to September 1958.
Chemical analyses: May 1953 to September 1954, October 1957 to August 1958.
Water temperatures: May 1953 to September 1954.
Sediment records: July 1953 to August 1954 (periodic).

Gage.--Wire-weight gage read once daily. Datum of gage is 24 ft above mean sea level (river-profile survey).

Average discharge.--5 years, 288 cfs (208,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,710 cfs Oct. 22 (gage height, 4.34 ft, from graph based on gage readings); maximum gage height observed, 5.83 ft Dec. 24 (ice jam); minimum discharge observed, 83 cfs July 8.
1953-58: Maximum discharge, 2,320 cfs May 7, 1954 (gage height, 4.95 ft, from graph based on gage readings); maximum gage height, 6.38 ft Apr. 29, 1956, from graph based on gage readings (ice jam); minimum discharge observed, 28 cfs July 28, 1953 (gage height, 1.81 ft), but may have been less during periods of no gage-height record.

Remarks.--Records fair except those for period of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	295	801	498				*280	1,290	441	137	230	126
2	278	890	610				320	1,450	420	140	198	188
3	238	1,550	447				360	1,360	349	140	223	447
4	230	1,480	317				410	1,270	*312	126	245	354
5	219	1,170	*321				450	1,180	373	126	383	441
6	215	1,110	310		(*)		480	1,050	498	118	*815	378
7	212	905	300				510	1,030	469	115	565	257
8	198	801	280	220	93	150	550	1,040	458	91	373	226
9	201	815	370				540	989	404	110	349	219
10	208	852	500				520	1,030	330	129	335	191
11	308	649	400				500	997	286	*118	270	181
12	458	610	300				490	920	344	132	394	194
13	436	610	240				480	905	359	118	766	*219
14	373	591	220				480	822	299	105	516	191
15	317	492	210				490	801	359	110	441	223
16	830	662	200				550	801	420	155	359	188
17	780	1,160	190				630	808	341	565	359	158
18	703	928	180				649	1,060	290	787	290	137
19	860	905	180				546	1,100	274	546	304	234
20	1,010	1,080	180				486	920	274	364	234	257
21	1,110	1,360	170				394	898	274	257	219	198
22	*1,530	905	170		100		420	815	253	171	184	201
23	1,230	759	170				534	745	234	171	174	452
24	905	668	160	130		180	801	710	215	201	212	317
25	794	642	160				766	696	201	208	270	234
26	675	668	160				759	546	184	177	245	230
27	578	584	160				935	464	174	308	212	249
28	745	498	160				1,070	504	168	369	201	188
29	1,030	430	160		-		*1,160	572	152	321	165	174
30	1,070	388	160		------		1,180	510	123	278	152	226
31	905	------	160		------		------	458	------	215	146	------
Total	18,941	24,963	8,043	5,380	2,695	5,130	17,720	27,741	9,278	6,908	9,829	7,278
Mean	611	832	259	174	96.2	165	591	895	309	223	317	243
Cfsm	2.70	3.68	1.15	0.770	0.426	0.730	2.62	3.96	1.37	0.987	1.40	1.08
In.	3.12	4.11	1.32	0.89	0.44	0.84	2.92	4.57	1.53	1.14	1.62	1.20
Ac-ft	37,570	49,510	15,950	10,670	5,350	10,180	35,150	55,020	18,400	13,700	19,500	14,440

Calendar year 1957: Max 1,550 Min 47 Mean 310 Cfsm 1.37 In. 18.61 Ac-ft 224,200
Water year 1957-58: Max 1,550 Min - Mean 394 Cfsm 1.74 In. 23.70 Ac-ft 285,400

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 24 to Apr. 16 (no gage-height record Dec. 25 to Apr. 9; discharge estimated on basis of 2 discharge measurements and weather records).

2400. ANCHOR RIVER AT ANCHOR POINT--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 4, 1957	a 234	27	0.35	1.6	6.7	5.5	1.3	42	2.0	5.0	0.1	0.5	71	32	0	78	6.7	30
Nov. 7	905	20	.17	2.4	3.3	4.4	.8	20	1.0	8.0	.1	.7	51	20	3	47	6.8	50
Dec. 12	300	24	.30	4.0	3.1	5.5	1.3	31	2.0	5.0	.2	.6	61	22	0	65	6.8	30
Jan. 23, 1958	130	31	.34	5.9	3.1	6.1	1.5	43	.0	5.0	.0	.4	74	27	0	83	7.1	20
Feb. 20	100	31	.40	6.0	4.7	6.8	1.5	50	1.0	5.0	.0	.8	82	34	0	95	6.5	20
May 20	a 973	19	.33	2.0	2.4	3.8	.8	23	1.0	3.0	.1	.3	44	15	0	44	6.3	20
July 15	a 118	28	.34	6.7	4.3	6.8	1.8	48	2.0	5.0	.2	.2	79	34	0	90	6.3	20
Aug. 21	219	27	.83	6.7	3.4	4.8	1.8	44	1.0	4.0	.0	.5	72	30	0	80	6.5	45

a Discharge at time of sampling.

2420. Kasilof River near Kasilof

Location.--Lat 60°19'05", long 151°15'35", in SW¼ sec.30, T.3 N., R.11 W., near center of span on downstream side of bridge on Sterling Highway, 0.9 mile upstream from Crooked Creek, 4 miles downstream from Moosehead Rapids, 5 miles south of Kasilof, and 10 miles downstream from Tustumena Lake.

Drainage area.--738 sq mi.

Records available.--Discharge: July 1949 to September 1958.
Chemical analyses: March to September 1952, October 1957 to August 1958.
Sediment records: June 1953 to August 1954 (periodic).

Gage.--Wire-weight gage read once daily. Datum of gage is 23.37 ft above mean sea level (Corps of Engineers bench mark).

Average discharge.--9 years, 2,420 cfs (1,752,000 acre-ft per year).

Extremes.--Maximum discharge during year, 11,000 cfs Aug. 16 (gage height, 7.38 ft, from graph based on gage readings); minimum daily, 531 cfs Apr. 26, 27, 29.
1949-58: Maximum discharge, 12,300 cfs Sept. 14, 1957 (gage height, 7.90 ft, from graph based on gage readings); maximum gage height observed, 8.62 ft Nov. 25, 1955 (backwater from ice); minimum discharge not determined.

Remarks.--Records good except those for periods of shifting-control, which are fair, and those for period of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8,720	4,980	2,560				*600	550	819	3,440	8,340	9,060
2	8,290	4,960	2,530				611	555	832	3,510	8,410	8,700
3	7,930	4,890	2,460				606	569	*867	3,640	8,360	8,410
4	7,670	4,810	2,430				595	584	916	3,860	8,310	8,080
5	7,410	4,680	*2,360		(*)		600	584	944	4,010	8,220	7,880
6	7,070	4,620	2,330				584	564	995	4,220	8,240	7,640
7	6,790	4,540	2,280				574	574	1,020	4,300	*8,340	7,440
8	6,610	4,400	2,180	1,300	770		569	579	1,090	4,440	8,220	7,300
9	6,360	4,280	2,120				584	595	1,180	4,580	8,190	7,210
10	6,030	4,140	2,050				616	589	1,290	4,730	8,290	6,950
11	5,770	3,990	2,010			570	611	606	1,390	*4,850	8,460	6,660
12	5,550	3,820	2,020				627	589	1,430	4,940	8,720	6,610
13	5,460	3,710	2,000				611	589	1,480	5,080	9,260	6,350
14	5,340	3,660	1,970				606	611	1,530	5,270	9,860	*6,220
15	5,120	3,590	1,900				616	633	1,570	5,460	10,400	6,060
16	4,980	3,530	1,900				616	638	1,620	5,590	10,800	5,910
17	4,920	3,460	1,800				616	638	1,660	5,750	10,800	5,800
18	4,790	3,430	1,800				589	633	1,690	5,860	10,600	5,720
19	4,770	3,360	1,700				584	638	1,800	6,010	10,400	5,630
20	4,660	3,270	1,700				579	656	1,950	6,080	10,300	5,440
21	4,940	3,240	1,600			560	569	679	2,120	6,170	10,300	5,230
22	*5,210	3,170	1,600		660	560	555	697	2,290	6,320	10,400	5,130
23	5,340	3,070	1,500	1,000		560	555	748	2,520	6,450	10,400	5,020
24	5,400	2,990	1,400			570	540	812	2,720	6,410	10,500	4,920
25	5,530	2,910	1,400			584	535	761	2,930	6,500	10,500	4,780
26	5,590	2,880	1,300			590	531	742	3,020	6,610	10,300	4,660
27	5,370	2,820	1,300			600	531	761	3,070	6,750	10,200	4,560
28	5,210	2,720	1,300			590	*535	774	3,150	6,880	9,780	4,380
29	5,250	2,650	1,200		-	579	531	799	3,270	7,120	9,580	4,270
30	5,230	2,600	1,200		------	564	540	787	3,380	7,710	9,480	4,190
31	5,120	------	1,200		------	560	------	799	------	8,390	9,300	------
Total	182,430	111,170	57,100	35,500	20,130	17,717	17,416	20,333	54,543	170,910	293,260	186,210
Mean	5,885	3,706	1,842	1,145	719	572	581	656	1,818	5,513	9,460	6,207
Cfsm	7.97	5.02	2.50	1.55	0.974	0.775	0.787	0.889	2.46	7.47	12.8	8.41
In.	9.19	5.60	2.88	1.79	1.01	0.89	0.88	1.02	2.75	8.61	14.78	9.38
Ac-ft	361,800	220,500	113,300	70,410	39,930	35,140	34,540	40,330	108,200	339,000	581,700	369,300

Calendar year 1957: Max 12,200 Min - Mean 3,137 Cfsm 4.25 In. 57.71 Ac-ft 2,271,000
Water year 1957-58: Max 10,800 Min 531 Mean 3,196 Cfsm 4.33 In. 58.78 Ac-ft 2,314,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 15 to Mar. 28 (no gage-height record Dec. 18, 23, 26, Dec. 30 to Mar. 28, except once-weekly readings; discharge estimated on basis of 1 discharge measurement and weather records). Shifting-control method used Apr. 16 to May 25, Aug. 13-15.

550195 O - 60 - 4

2420. KASILOF RIVER NEAR KASILOF--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, Magnesium	Noncarbonate			
Oct. 4, 1957	a 9,550	4.5	0.16	4.4	2.1	1.2	1.5	17	8.5	0.0	0.1	0.4	31	20	6	40	6.8	25
Nov. 6	a 5,040	9.4	--	4.8	.9	1.4	1.4	21	1.0	1.2	.0	.5	31	16	0	46	7.0	25
Dec. 12	2,020	5.0	.17	4.8	1.2	1.6	1.7	20	3.0	1.0	.0	.3	28	17	0	43	6.6	20
Jan. 23, 1958	1,000	5.0	.15	4.4	1.2	1.7	1.8	20	2.0	1.0	.0	.4	27	16	0	45	6.6	10
Feb. 20	660	5.4	.02	4.8	.9	1.3	1.6	18	5.0	.0	.0	.4	28	16	0	44	6.5	15
May 20	656	5.2	.11	4.0	1.6	1.2	1.4	19	4.0	1.0	.0	.1	28	16	1	42	6.3	5
July 15	a 5,720	5.1	.05	4.0	1.9	1.4	1.5	16	6.0	2.5	.2	.2	31	18	5	41	5.9	20
Aug. 21	10,300	5.1	.08	4.8	.7	.9	1.9	17	4.0	.5	.0	.3	26	15	1	42	6.2	10

a Discharge at time of sampling.

2440. Ptarmigan Creek at Lawing

Location.--Lat 60°24'20", long 149°21'45", on right bank 200 ft upstream from bridge on Seward-Anchorage Highway, 0.2 mile north of Lawing, 0.3 mile upstream from mouth, and 3 miles downstream from Ptarmigan Lake.

Drainage area.--32.6 sq mi.

Records available.--Discharge: May 1947 to September 1958 (discontinued).
Chemical analyses: February to September 1952, October 1957 to August 1958.

Gage.--Water-stage recorder. Altitude of gage is 500 ft (from topographic map). Prior to June 11, 1952, staff gage at site 200 ft downstream at different datum.

Average discharge.--11 years, 111 cfs (80,360 acre-ft per year).

Extremes.--Maximum discharge during year, 590 cfs June 21 (gage height, 2.42 ft); maximum gage height recorded, 3.63 ft Dec. 21 (backwater from ice); minimum discharge not determined.
1947-58: Maximum discharge, 980 cfs June 29, 1953 (gage height, 3.28 ft); maximum gage height recorded, 4.38 ft Dec. 18, 1956 (backwater from ice); minimum discharge not determined.

Remarks.--Records fair except those for period of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	119	244	76				19	*78	241	251	195	158
2	108	230	81				20	82	*273	259	192	155
3	98	237	*81				22	89	285	269	192	155
4	88	259	78				*25	91	289	285	189	145
5	80	244	75				30	97	292	308	195	137
6	75	220	69				33	97	316	324	201	135
7	70	192	65		(*)		35	98	411	*300	207	130
8	68	166	59	36	22		37	102	488	269	*204	128
9	67	150	56				39	100	460	255	214	121
10	65	137	53				40	100	377	255	204	115
11	64	125	50				41	98	328	244	201	110
12	63	119	47				42	98	296	217	266	110
13	63	108	44				43	104	292	201	328	110
14	62	104	42				42	104	262	211	381	110
15	62	95	40				41	104	234	204	403	*104
16	62	97	38			18	41	106	230	251	351	102
17	62	119	37				40	104	230	347	304	98
18	137	123	35				40	104	230	372	273	97
19	332	121	34				39	104	266	335	251	95
20	324	130	33				39	102	372	300	230	91
21	351	150	32				39	106	550	277	241	88
22	424	145	31		20		38	112	535	269	273	84
23	364	133	30				38	125	428	269	262	89
24	292	119	30	33			39	135	347	248	292	100
25	*244	106	29				40	142	304	214	289	102
26	204	98	28				44	142	292	192	259	100
27	174	89	28				49	142	285	248	227	98
28	174	82	27				56	135	277	312	195	93
29	248	81	27		-		63	137	269	292	180	86
30	296	80	27		------		72	158	251	241	174	84
31	262	------	27		------		------	204	------	211	166	------
Total	5,102	4,303	1,409	1,068	590	558	1,186	3,500	9,710	8,230	7,539	3,330
Mean	165	143	45.5	34.5	21.1	18.0	39.5	113	324	265	243	111
Cfsm	5.06	4.39	1.40	1.06	0.647	0.552	1.21	3.47	9.94	8.13	7.45	3.40
In.	5.82	4.91	1.61	1.22	0.67	0.64	1.35	3.99	11.08	9.39	8.60	3.80
Ac-ft	10,120	8,530	2,790	2,120	1,170	1,110	2,350	6,940	19,260	16,320	14,950	6,600

Calendar year 1957: Max 735 Min 13 Mean 122 Cfsm 3.74 In. 50.82 Ac-ft 88,330
Water year 1957-58: Max 550 Min - Mean 127 Cfsm 3.90 In. 53.08 Ac-ft 92,260

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 11 to Apr. 30 (no gage-height record Dec. 22 to Feb. 6, Feb. 13-15, Feb. 21 to Apr. 3; discharge estimated on basis of 2 discharge measurements, weather records, and records for Grant Creek near Moose Pass).

2440. PTARMIGAN CREEK AT LAWING--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 3, 1957	98	4.6	0.05	18	3.5	1.5	1.0	48	18	0.5	0.1	1.1	72	60	20	113	7.1	5
Nov. 6	220	5.5	.06	25	1.9	1.7	1.1	47	16	15	.0	1.7	91	70	32	209	6.7	5
Dec. 11	50	5.2	.06	18	1.8	2.2	1.0	51	14	1.0	.0	1.5	70	52	11	121	7.1	5
Jan. 22, 1958	33	5.1	.02	19	1.9	1.8	1.2	50	14	1.5	.0	1.4	71	55	14	122	7.3	0
Feb. 19	20	4.8	.02	19	2.4	1.7	1.1	51	18	1.5	.0	1.0	74	58	16	129	7.6	0
May 21	106	5.2	.02	18	2.5	1.3	.8	45	17	2.5	.1	2.5	72	55	18	115	7.0	0
July 16	251	4.8	.05	18	2.5	1.2	.8	46	17	2.5	.0	1.2	71	55	18	116	7.0	0
Aug. 20	230	4.3	.03	17	1.7	1.2	.6	42	16	2.5	.1	.9	65	50	15	110	6.9	0

2460. Grant Creek near Moose Pass

Location.--Lat 60°27'25", long 149°21'15", on right bank 0.3 mile upstream from mouth, 0.8 mile downstream from Grant Lake, and 2.3 miles south of Moose Pass.

Drainage area.--44.2 sq mi.

Records available.--Discharge: September 1947 to September 1958 (discontinued). Chemical analyses: October 1957 to August 1958.

Gage.--Water-stage recorder. Datum of gage is 491 ft above mean sea level (river-profile survey). Prior to July 1, 1952, staff gage at site 0.1 mile downstream at datum 7.23 ft lower.

Average discharge.--11 years, 193 cfs (139,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,020 cfs June 21 (gage height, 3.42 ft); minimum, 23 cfs Mar. 4 (gage height, 0.56 ft).
1947-58: Maximum discharge, 2,230 cfs June 28, 1953 (gage height, 4.46 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for periods of ice effect, which are fair.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	175	253	98	b32	32	27	44	*125	335	447	361	220
2	156	230	104	b32	32	27	48	139	*372	447	361	212
3	143	227	*100	b33	32	27	49	154	408	464	368	199
4	129	253	94	35	31	26	*50	162	424	477	361	186
5	119	240	94	40	30	26	50	164	447	520	379	178
6	110	215	89	49	30	25	52	162	491	545	404	176
7	104	193	82	56	*b30	25	55	158	610	*496	424	178
8	100	172	76	62	b30	26	59	154	726	456	420	174
9	96	158	70	58	29	25	60	145	705	431	*416	169
10	93	147	68	54	29	25	62	141	610	424	393	160
11	91	141	61	51	29	25	65	139	555	416	390	158
12	86	143	60	48	29	24	66	141	515	382	431	160
13	82	143	55	45	28	24	67	143	496	365	539	160
14	79	135	52	43	29	25	69	143	431	368	761	158
15	76	124	49	41	28	25	68	143	390	358	810	*156
16	90	127	47	38	28	25	68	145	397	393	616	151
17	96	163	45	36	28	25	67	147	404	529	539	145
18	196	156	44	42	30	25	67	143	404	576	456	139
19	423	143	42	58	30	25	65	141	443	571	408	138
20	411	160	40	56	29	25	66	145	599	520	382	132
21	427	185	39	53	28	25	65	156	965	486	390	125
22	520	172	b37	51	28	25	65	169	941	473	404	120
23	448	154	b36	49	28	25	64	186	768	469	393	134
24	*356	135	b35	44	28	25	64	210	622	424	416	147
25	295	120	b34	43	27	26	65	215	555	382	397	141
26	243	120	b33	40	27	25	69	223	520	361	365	138
27	201	112	b33	39	27	25	77	218	505	408	328	134
28	218	108	b32	38	28	26	87	212	491	486	296	129
29	288	104	b32	35	-	26	101	212	469	469	269	123
30	302	102	b32	34	------	27	114	242	443	408	245	115
31	262	------	b32	33	------	29	------	290	------	382	231	------
Total	6,415	4,835	1,745	1,368	814	791	1,968	5,267	16,041	13,933	12,953	4,655
Mean	207	161	56.3	44.1	29.1	25.5	65.6	170	535	449	418	155
Cfsm	4.68	3.64	1.27	0.998	0.658	0.577	1.48	3.85	12.1	10.2	9.46	3.51
In.	5.40	4.07	1.47	1.15	0.68	0.67	1.66	4.43	13.50	11.72	10.90	3.92
Ac-ft	12,720	9,590	3,460	2,710	1,610	1,570	3,900	10,450	31,820	27,640	25,690	9,230

Calendar year 1957: Max 1,500 Min - Mean 202 Cfsm 4.57 In. 62.12 Ac-ft 146,400
Water year 1957-58: Max 965 Min 24 Mean 194 Cfsm 4.39 In. 59.57 Ac-ft 140,400

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

2460. GRANT CREEK NEAR MOOSE PASS--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 3, 1957	143	3.2	0.06	9.1	2.4	0.9	0.8	27	9.5	0.5	0.0	0.8	40	32	10	65	7.0	10
Dec. 11	61	3.3	.08	9.9	1.2	1.3	1.3	28	7.0	2.0	.1	.9	41	29	6	70	6.7	0
Jan. 22, 1958	51	4.7	.02	11	1.5	1.1	.7	32	9.0	1.0	.0	.9	46	33	7	75	7.2	0
Feb. 19	30	4.4	.02	10	1.8	.9	.6	32	8.0	1.0	.0	1.2	44	32	6	76	7.2	0
May 21	156	3.6	.07	10	2.1	.8	.6	27	9.0	2.0	.0	.8	42	34	12	81	6.4	0
July 16	393	3.7	.03	11	1.0	.7	.6	25	10	2.0	.1	.9	42	32	11	71	6.3	5
Aug. 21	390	3.2	.05	10	1.6	.6	.7	29	9.0	.5	.1	.3	40	32	8	73	6.8	10

2480. Trail River near Lawing

Location.--Lat 60°26'00", long 149°22'20", near center of stream on downstream end of pier at bridge site on old Seward-Anchorage highway, 0.2 mile upstream from Falls Creek, 0.2 mile downstream from Lower Trail Lake, 1.9 miles upstream from mouth, and 2.1 miles north of Lawing.

Drainage area.--195 sq mi.

Records available.--Discharge: May 1947 to September 1958.
Chemical analyses: November 1951 to September 1952, October 1957 to August 1958.

Gage.--Water-stage recorder. Altitude of gage is 460 ft (from topographic map). Prior to Sept. 13, 1952, staff gage at same site and datum.

Average discharge.--11 years, 789 cfs (571,200 acre-ft per year).

Extremes.--Maximum discharge during year, 4,080 cfs June 22 (gage height, 9.22 ft); minimum, 84 cfs Mar. 20 (gage height, 2.98 ft).
1947-58: Maximum discharge, 5,860 cfs June 28, 1953 (gage height, 10.16 ft); minimum daily, 48 cfs Feb. 9, 10, 1949.

Remarks.--Records good except those for periods of ice effect or shifting control, which are fair.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	862	1,140	405	158	149	101	128	*637	1,360	1,880	1,600	990
2	*735	1,060	429	160	145	101	166	722	*1,570	1,920	1,580	960
3	647	1,020	*417	164	140	101	199	795	1,730	1,990	1,640	925
4	581	1,090	385	170	133	99	*226	815	1,840	2,060	1,600	850
5	535	1,090	373	179	131	99	237	815	1,910	2,220	1,710	795
6	495	1,030	354	194	126	99	259	781	2,060	2,400	1,940	786
7	465	930	335	208	*123	98	274	758	2,410	*2,230	2,020	795
8	435	860	304	214	123	96	300	740	2,820	2,060	1,990	815
9	415	781	281	208	122	93	317	709	2,840	1,940	*1,980	786
10	410	727	268	201	116	92	324	668	2,520	1,900	1,960	732
11	410	686	265	197	111	90	331	646	2,240	1,920	1,900	709
12	395	660	251	190	111	90	339	646	2,080	1,740	2,110	704
13	370	642	242	183	107	91	342	655	2,010	1,610	2,570	700
14	356	614	234	175	106	91	346	650	1,820	1,650	3,490	704
15	338	571	221	170	104	91	342	655	1,630	1,650	3,590	*700
16	366	558	206	164	104	88	335	664	1,580	1,700	2,970	678
17	430	650	194	166	103	87	324	682	1,600	2,230	2,390	646
18	820	678	190	197	102	86	317	673	1,620	2,600	2,020	619
19	2,340	650	185	216	101	85	314	650	1,720	2,620	1,800	597
20	2,330	668	179	224	102	84	307	650	2,160	2,420	1,670	580
21	2,140	754	175	221	106	85	300	668	3,410	2,200	1,680	533
22	2,410	754	170	218	106	85	290	727	3,930	2,140	2,050	490
23	2,280	686	164	214	106	85	287	795	3,270	2,180	2,060	498
24	*1,760	624	160	201	104	86	284	860	2,640	2,130	2,130	546
25	1,420	558	158	194	103	85	287	895	2,290	1,860	2,040	558
26	1,170	528	158	190	102	85	304	925	2,140	1,660	1,760	541
27	985	507	158	183	102	85	331	930	2,090	1,780	1,480	541
28	940	469	156	177	102	85	377	925	2,030	2,250	1,310	511
29	1,190	453	156	172	-	85	461	925	1,980	2,320	1,180	485
30	1,370	433	156	166	------	86	550	975	1,900	1,980	1,090	449
31	1,260	------	156	158	------	93	------	1,140	------	1,720	1,030	------
Total	30,660	21,871	7,485	5,832	3,190	2,807	9,198	23,776	65,200	62,960	60,340	20,223
Mean	989	729	241	188	114	90.5	307	767	2,173	2,031	1,946	674
Cfsm	5.07	3.74	1.24	0.964	0.585	0.464	1.57	3.93	11.1	10.4	9.98	3.46
In.	5.85	4.17	1.43	1.11	0.61	0.54	1.75	4.53	12.43	12.01	11.51	3.86
Ac-ft	60,810	43,380	14,850	11,570	6,330	5,570	18,240	47,160	129,300	124,900	119,700	40,110

Calendar year 1957: Max 4,700 Min 80 Mean 905 Cfsm 4.64 In. 62.98 Ac-ft 654,900
Water year 1957-58: Max 3,930 Min 84 Mean 859 Cfsm 4.41 In. 59.80 Ac-ft 621,900

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 20 to Jan. 4. Shifting-control method used Oct. 18-23.

2480. TRAIL RIVER NEAR LAWING--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium Magnesium	Noncarbonate			
Oct. 3, 1957	647	3.3	0.02	11	1.2	0.6	0.8	30	10	1.0	0.0	1.0	44	32	8	75	7.2	25
Nov. 6	1,030	4.0	.17	13	.8	1.1	1.0	32	10	.5	.0	1.1	48	36	10	83	7.0	40
Dec. 11	265	5.0	.13	15	1.5	1.7	.8	44	9.0	.5	.1	1.4	57	44	8	99	6.8	10
Jan. 22, 1958	218	5.2	.02	15	1.5	1.4	.7	43	9.0	1.0	.0	1.4	56	44	8	99	7.4	5
Feb. 19	101	6.8	.02	15	2.4	1.4	.6	42	12	2.0	.0	1.2	62	48	13	105	6.7	5
May 21	668	4.8	.18	15	.8	1.0	.6	36	10	2.0	.1	1.5	54	40	11	88	6.7	0
July 16	1,700	3.5	.07	11	1.5	.7	.6	27	8.0	2.0	.1	.7	41	34	12	75	5.9	20
Aug. 20	1,670	2.9	.06	10	1.4	.6	.7	31	7.5	.5	.1	.2	39	31	6	73	6.8	15

2530. Crescent Creek near Moose Pass

Location.--Lat 60°28'45", long 149°34'25", on left bank 90 ft downstream from Crescent Lake Outlet and 7 miles west of Moose Pass.

Drainage area.--21.4 sq mi.

Records available.--May 1957 to September 1958.

Gage.--Water-stage recorder. Datum of gage is 1,452.5 ft above mean sea level (river-profile survey).

Extremes.--Maximum discharge during year, 210 cfs June 8; maximum gage height, 2.65 ft Oct. 31; minimum discharge, 14 cfs Feb. 19, 25, Mar. 20, 21, 23, 24, 26; minimum gage height, 1.36 ft Feb. 19.
1957-58: Maximum discharge, 210 cfs June 9, 1957, June 8, 1958; maximum gage height, 2.85 ft Sept. 15, 1957; minimum discharge, that of Feb. 19, 25, Mar. 20, 21, 23, 24, 26, 1958.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	104	65	29	25	16	a18	26	112	112	70	76
2	61	114	65	31	24	16	a18	31	123	108	70	74
3	57	137	62	30	24	15	*17	35	130	108	71	74
4	50	150	56	32	*23	16	16	38	137	106	70	71
5	46	145	52	34	23	16	16	41	145	108	66	68
6	41	137	48	b37	22	16	16	42	153	108	65	66
7	38	130	45	b39	21	16	16	45	179	108	65	65
8	35	123	44	b40	21	16	17	47	206	*100	*66	62
9	34	114	45	b40	20	16	17	48	206	96	70	62
10	31	108	42	b38	19	16	17	49	194	94	70	61
11	30	102	41	b37	18	15	17	50	179	92	70	*61
12	27	94	40	b35	17	15	16	52	170	89	74	65
13	26	87	38	b33	17	15	16	53	159	86	79	65
14	25	82	37	b31	17	15	17	53	148	80	80	64
15	24	79	36	b30	17	15	17	54	135	76	82	62
16	30	79	34	30	16	16	17	57	135	87	80	62
17	28	80	33	31	16	16	17	58	128	89	79	62
18	46	77	a32	32	15	15	17	59	123	92	76	61
19	61	76	a31	34	14	15	17	61	126	91	72	62
20	68	77	a30	39	15	14	17	61	137	89	72	61
21	89	77	a30	33	16	14	17	65	161	87	74	59
22	104	74	a29	31	16	15	17	68	164	86	74	62
23	*112	70	a29	34	16	14	17	72	156	84	76	70
24	112	68	a29	32	15	14	17	80	145	82	84	70
25	108	66	a28	31	14	15	17	84	142	77	87	70
26	100	66	a28	29	15	14	18	86	135	74	89	70
27	94	64	a28	25	16	15	18	*86	130	77	87	66
28	100	65	a28	27	15	15	19	86	126	79	86	65
29	119	65	*28	26	-	16	21	87	121	76	82	62
30	128	64	28	26	------	a16	23	92	116	72	80	64
31	116	------	28	25	------	a17	------	102	------	71	77	------
Total	2,006	2,774	1,189	1,001	507	475	520	1,868	4,421	2,784	2,343	1,962
Mean	64.7	92.5	38.4	32.3	18.1	15.3	17.3	60.3	147	89.8	75.6	65.4
Cfsm	3.02	4.32	1.79	1.51	0.846	0.715	0.808	2.82	6.87	4.20	3.53	3.06
In.	3.49	4.82	2.07	1.74	0.88	0.83	0.90	3.25	7.68	4.84	4.07	3.41
Ac-ft	3,980	5,500	2,360	1,990	1,010	942	1,030	3,710	8,770	5,520	4,650	3,890

Calendar year 1957: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1957-58: Max 206 Min 14 Mean 59.9 Cfsm 2.80 In. 37.98 Ac-ft 43,350

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 2 discharge measurements, weather records, and records for Cooper Creek near Cooper Landing.
b Stage-discharge relation affected by ice.

2540. Crescent Creek near Cooper Landing

Location.--Lat 60°29'50", long 149°40'40", on left bank at bridge on old Seward-Kenai highway, 0.3 mile upstream from mouth and 5.3 miles east of Cooper Landing.

Drainage area.--31.7 sq mi.

Records available.--Discharge: July 1949 to September 1958.
Chemical analyses: April to September 1952, October 1957 to August 1958.

Gage.--Water-stage recorder. Altitude of gage is 550 ft (from topographic map). Prior to Aug. 19, 1949, staff gage at same site and datum.

Average discharge.--9 years, 72.3 cfs (52,340 acre-ft per year).

Extremes.--Maximum discharge during year, 300 cfs June 7 (gage height, 1.55 ft); maximum gage height observed, 3.09 ft Dec. 18 (backwater from ice); minimum discharge observed, 8 cfs Mar. 31 (discharge measurement), caused by storage behind ice jam upstream.
1949-58: Maximum discharge, 820 cfs June 28, 1953; maximum gage height observed, that of Dec. 18, 1957; minimum discharge observed, 2.7 cfs Mar. 8, 1954 (discharge measurement), caused by storage behind ice jam upstream.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	202	76				b13	60	150	166	103	110
2	93	210	76				b17	67	163	163	105	107
3	90	213	76		(*)		b18	72	*176	160	105	105
4	88	217	74				b20	72	183	160	103	105
5	84	202	74				b20	73	202	169	100	103
6	79	187	*74				b20	72	230	166	98	100
7	77	173	70				b20	73	275	160	100	100
8	76	160	67				b21	74	280	*149	*100	98
9	73	150	66				b21	77	275	140	105	96
10	73	139	64				b22	77	256	140	100	94
11	72	130					b22	80	243	130	103	*92
12	70	120					b22	80	230	124	120	105
13	69	110					b23	80	206	124	124	100
14	67	101					b24	80	194	122	127	98
15	66	97		46	23	19	b24	82	180	117	124	92
16	82	104					25	82	184	132	117	85
17	76	104					25	84	175	138	114	81
18	142	97					27	84	172	138	112	83
19	147	91					27	86	187	135	110	87
20	144	101	47				28	86	203	130	107	85
21	180	99					28	91	238	122	112	81
22	198	93					29	95	242	122	114	85
23	*180	86					30	106	223	120	114	100
24	166	82					31	110	200	114	127	98
25	157	80					34	115	193	112	130	96
26	147	80					38	113	187	107	127	94
27	139	77					43	115	184	117	127	92
28	142	76					*48	110	181	117	124	87
29	176	76			-		53	115	178	110	122	87
30	180	76	(*)		------		56	125	169	105	120	87
31	180	------			------	*b8	------	136	------	100	114	------
Total	3,608	3,733	1,704	1,426	644	578	829	2,772	6,159	4,109	3,508	2,833
Mean	116	124	55.0	46	23	18.6	27.6	89.4	205	133	113	94.4
Cfsm	3.66	3.91	1.74	1.45	0.726	0.587	0.871	2.82	6.47	4.20	3.56	2.98
In.	4.23	4.38	2.00	1.67	0.76	0.68	0.97	3.25	7.23	4.82	4.12	3.32
Ac-ft	7,160	7,400	3,380	2,830	1,280	1,150	1,640	5,500	12,220	8,150	6,960	5,620

Calendar year 1957: Max 337 Min 10 Mean 78.7 Cfsm 2.48 In. 33.69 Ac-ft 56,950
Water year 1957-58: Max 280 Min 8 Mean 87.4 Cfsm 2.76 In. 37.43 Ac-ft 63,290

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Dec. 7 to Mar. 30 except occasional days (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 4 discharge measurements, weather records, and records for station near Moose Pass.

2540. CRESCENT CREEK NEAR COOPER LANDING--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, Magnesium	Noncarbonate			
Oct. 3, 1957	95	4.4	0.03	13	2.4	1.8	0.2	43	6.5	1.5	0.1	0.3	51	42	8	86	7.0	5
Nov. 6	180	6.4	.03	13	1.2	2.0	.2	41	5.3	1.5	.0	1.5	51	38	4	87	7.5	0
Dec. 11	47	5.4	.02	14	1.4	2.3	.6	44	6.4	2.0	.2	1.6	56	41	5	96	7.4	0
Jan. 22, 1958	46	5.0	.02	15	1.5	2.5	.4	47	6.0	2.0	.0	1.2	57	44	5	97	7.1	0
Feb. 19	23	6.8	.02	14	2.8	2.6	.3	49	7.0	3.0	.0	1.2	62	46	6	104	7.6	0
May 20	80	4.9	.09	12	2.1	2.2	.1	42	7.0	1.5	.0	.0	51	38	4	77	6.9	0
July 15	62	4.6	.04	13	2.7	1.8	.2	40	11	2.5	.0	.7	56	44	10	85	--	0
Aug. 22	59	4.4	.05	12	2.3	1.7	.3	42	7.0	1.5	.1	.4	51	40	5	90	7.0	0

2580. Kenai River at Cooper Landing

Location.--Lat 60°29'35", long 149°48'25", near center of span on downstream side of bridge on Sterling Highway, 0.9 mile east of Cooper Landing, 0.9 mile upstream from Bean Creek, and 1.2 miles downstream from Snug Harbor.

Drainage area.--634 sq mi.

Records available.--Discharge: May 1947 to September 1958.
Chemical analyses: July to September 1950, April to September 1952, October 1957 to August 1958.

Gage.--Wire-weight gage read once daily. Datum of gage is 429.27 ft above mean sea level (river-profile survey). May 11, 1947, to Mar. 10, 1949, staff gage and Mar. 11, 1949, to Apr. 13, 1950, wire-weight gage, at bridge 0.9 mile downstream at different datum.

Average discharge.--11 years, 2,713 cfs (1,964,000 acre-ft per year).

Extremes.--Maximum discharge during year, 12,400 cfs Nov. 4 (gage height, 10.01 ft); minimum observed, 352 cfs Mar. 26, 27 (gage height, 1.65 ft).
1947-58: Maximum discharge, 20,600 cfs June 29, 1953 (gage height, 12.36 ft, from graph based on gage readings), from rating curve extended above 10,000 cfs by logarithmic plotting; minimum daily, 190 cfs Mar. 15-24, 1951.

Remarks.--Records good.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,900	7,840	1,890	b661	636	437	362	1,060	3,140	6,820	6,860	4,610
2	3,560	11,500	1,830	b661	624	430	373	1,120	3,380	6,640	6,930	4,400
3	3,380	12,100	1,770	b665	607	423	383	1,200	*5,800	6,520	6,360	4,260
4	3,160	12,300	1,710	b669	591	419	398	1,430	4,200	6,750	*5,940	3,990
5	3,000	12,200	1,650	698	*595	416	423	1,510	4,580	6,900	6,080	3,800
6	2,740	11,700	*1,620	736	580	412	470	1,610	5,050	7,190	6,240	3,630
7	2,500	11,000	1,550	746	568	409	470	1,630	6,360	7,190	6,480	3,510
8	2,280	7,100	1,480	754	553	409	473	1,690	6,400	7,170	6,540	3,370
9	2,170	5,030	1,370	746	545	405	534	1,770	6,820	*6,680	6,620	3,240
10	2,070	3,630	1,360	746	545	405	553	1,800	7,120	6,620	6,620	*3,110
11	1,950	3,350	1,340	746	538	401	561	1,840	7,040	6,560	6,660	3,010
12	1,780	3,070	1,270	741	530	398	568	1,840	6,860	6,460	7,170	2,930
13	1,750	2,880	1,200	718	519	394	576	1,850	6,860	6,240	8,150	2,880
14	1,710	2,820	1,170	702	511	387	595	1,880	6,930	6,040	9,630	2,810
15	1,690	2,760	1,170	689	504	380	616	1,940	6,540	6,000	10,800	2,680
16	1,720	2,720	1,090	681	496	369	636	1,960	6,060	5,920	10,300	2,650
17	1,740	2,720	1,030	673	488	369	652	2,000	5,940	6,860	9,900	2,580
18	2,080	2,700	987	706	473	369	673	2,010	5,940	7,700	9,230	2,610
19	3,800	2,650	972	714	463	369	698	2,030	6,040	8,150	7,930	2,550
20	5,240	2,630	933	718	459	366	710	2,060	6,100	8,480	7,010	2,650
21	6,340	2,670	885	714	455	362	728	2,090	6,320	8,220	6,770	2,540
22	7,060	2,630	826	710	455	362	746	2,170	9,440	8,000	7,340	2,550
23	*7,080	2,650	800	736	452	362	764	2,320	10,000	7,840	7,370	2,570
24	6,900	2,570	782	754	448	362	795	2,530	9,470	7,630	7,790	2,540
25	6,140	2,470	768	714	445	359	795	2,540	9,100	7,480	8,270	2,540
26	5,410	2,290	b741	698	445	352	795	2,540	8,340	7,300	8,170	2,480
27	5,060	2,200	b723	681	441	352	822	2,600	8,100	6,930	7,390	2,410
28	5,060	2,130	b706	673	441	355	862	2,650	7,740	7,520	6,340	2,390
29	5,120	2,020	b681	665	-	355	914	2,670	7,300	8,270	5,600	2,360
30	5,330	1,980	b669	652	------	355	*982	2,720	7,040	7,790	5,140	2,250
31	5,660	------	b661	636	------	*355	------	2,880	------	7,480	4,990	------
Total	117,380	146,310	35,614	21,803	14,407	11,898	18,927	61,940	198,010	221,350	226,620	89,900
Mean	3,786	4,877	1,149	703	515	384	631	1,998	6,600	7,140	7,310	2,997
Cfsm	5.97	7.69	1.81	1.11	0.812	0.606	0.995	3.15	10.4	11.3	11.5	4.73
In.	6.89	8.58	2.09	1.28	0.85	0.70	1.11	3.63	11.62	12.98	13.29	5.27
Ac-ft	232,800	290,200	70,640	43,250	28,580	23,600	37,540	122,900	392,700	439,000	449,500	178,300

Calendar year 1957: Max 16,200 Min 260 Mean 3,264 Cfsm 5.15 In. 69.89 Ac-ft 2,363,000
Water year 1957-58: Max 12,300 Min 352 Mean 3,189 Cfsm 5.03 In. 68.29 Ac-ft 2,309,000

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

2580. KENAI RIVER AT COOPER LANDING--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, Magnesium	Noncarbonate			
Oct. 3, 1957	3,380	3.6	0.09	10	3.5	0.9	0.8	32	9.5	1.5	0.1	1.0	47	40	14	72	7.0	10
Nov. 6	11,700	5.3	.08	14	1.1	1.3	.8	38	10	1.0	.0	2.6	55	40	8	89	7.3	35
Dec. 11	3,350	9.1	.11	17	1.5	2.0	.8	45	13	1.0	.1	3.1	70	48	12	110	7.2	20
Jan. 22, 1958	710	3.4	.07	11	.8	1.0	.8	31	7.0	1.0	.0	.8	41	30	5	70	7.0	15
Feb. 19	463	5.2	.11	9.5	1.7	1.1	.8	29	6.0	1.0	.0	1.0	40	30	6	69	6.3	10
May 20	2,060	3.6	.14	10	1.1	1.2	.5	15	6.0	1.5	.0	.5	40	30	5	67	7.1	0
July 15	6,000	4.0	.12	11	2.0	1.1	.9	32	9.0	2.0	.0	.8	47	36	10	73	6.8	0
Aug. 21	6,770	3.4	.05	11	.8	1.1	.7	31	8.0	.5	.1	.0	41	30	5	72	6.9	10

2600. Cooper Creek near Cooper Landing

Location.--Lat 60°26'00", long 149°49'15", on left bank 125 ft downstream from Cooper Lake Outlet, 1.4 miles upstream from Stetson Creek, and 4 miles south of Cooper Landing.

Drainage area.--31.8 sq mi.

Records available.--August 1949 to September 1958.

Gage.--Water-stage recorder. Datum of gage is 1,165.5 ft above mean sea level (river-profile survey).

Average discharge.--9 years, 90.0 cfs (65,160 acre-ft per year).

Extremes.--Maximum discharge during year, 422 cfs June 22 (gage height, 3.13 ft); minimum not determined.
1949-58: Maximum discharge, 729 cfs June 29, 1953 (gage height, 4.02 ft); minimum not determined.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	127	247	100					76	162	299	193	145
2	119	267	99					85	168	293	190	139
3	115	331	97				(*)	96	175	291	188	137
4	109	359	87		(*)			100	186	293	*177	135
5	102	336	85					110	202	301	171	131
6	104	312	84					110	223	304	166	125
7	92	282	79					110	259	296	164	121
8	89	257	75					120	301	*285	164	117
9	85	238	75					120	323	274	171	111
10	84	216	71					120	320	264	171	109
11	81	193	68					120	310	250	171	*104
12	78	177	65					127	301	238	199	108
13	76	162	61					125	296	226	219	106
14	75	151	56					133	277	216	235	104
15	73	143	53					135	257	209	238	102
				38	21	18	32					
16	84	151	51					135	262	214	231	97
17	87	151	46					135	252	223	216	97
18	127	145	b44					131	247	240	195	90
19	182	141	b42					125	267	243	184	92
20	197	153	b40					125	307	235	175	90
21	233	168	b38					135	386	223	177	87
22	277	160	b37					139	419	223	177	92
23	*289	149	b36					139	407	219	173	100
24	257	139	b35					135	377	216	188	106
25	243	129	b34					135	362	207	195	108
26	226	123	b34					137	345	199	195	106
27	211	115	33					*139	334	214	188	100
28	211	109	33					139	326	223	179	97
29	247	104	*b33		-			139	312	221	171	99
30	277	102	33		------			145	304	211	162	95
31	272	------	33		------		------	153	------	199	151	------
Total	4,809	5,710	1,757	1,178	588	558	960	3,873	8,667	7,549	5,774	3,250
Mean	155	190	56.7	38	21	18	32	125	289	244	186	108
Cfsm	4.87	5.97	1.78	1.19	0.660	0.566	1.01	3.93	9.09	7.67	5.85	3.40
In.	5.62	6.68	2.05	1.38	0.69	0.65	1.12	4.53	10.14	8.83	6.75	3.80
Ac-ft	9,540	11,330	3,480	2,340	1,170	1,110	1,900	7,680	17,190	14,970	11,450	6,450

Calendar year 1957: Max 359 Min - Mean 101 Cfsm 3.18 In. 43.20 Ac-ft 73,280
Water year 1957-58: Max 419 Min - Mean 122 Cfsm 3.84 In. 52.24 Ac-ft 88,610

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Dec. 27, 28, Dec. 30 to May 11 (stage-discharge relation affected by ice during part of period); discharge estimated on basis of 3 discharge measurements, weather records, and records for station at mouth near Cooper Landing and Crescent Creek near Moose Pass.

2605. Stetson Creek near Cooper Landing

Location.--Lat 60°26'30", long 149°51'05", on left bank 0.3 mile upstream from mouth and 3.4 miles southwest of Cooper Landing.

Drainage area.--8.6 sq mi.

Records available.--May to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 1,100 ft (from topographic map).

Extremes.--Maximum discharge during period May to September, 193 cfs June 21 (gage height, 3.13 ft), from rating curve extended above 60 cfs by logarithmic plotting; minimum, 23 cfs Sept. 18 (gage height, 1.88 ft).

Remarks.--Records good except those above 70 cfs, which are fair.

Discharge, in cubic feet per second, May to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							-	-	73	73	35	30
2							-	-	78	74	35	29
3							†3.8	-	78	74	34	29
4					†7.2		-	-	78	72	34	29
5							-	-	108	74	34	28
6							-	-	140	65	34	27
7							-	-	157	58	*35	27
8							-	-	145	56	35	26
9							-	-	99	*52	37	26
10							-	-	78	51	35	25
11							-	-	73	48	38	26
12							-	-	73	43	49	28
13							-	-	68	46	54	26
14							-	-	64	48	54	*25
15							-	-	58	44	49	25
16							-	-	58	48	44	24
17							-	-	59	58	41	24
18							-	-	61	59	39	23
19							-	-	107	53	37	26
20							-	-	166	48	36	24
21							-	-	161	47	36	24
22							-	-	119	49	36	27
23							-	-	91	52	36	35
24							-	*44	80	46	36	32
25							-	44	78	44	35	30
26							-	45	78	39	35	28
27							-	45	76	47	35	28
28			†9.4				-	45	73	48	35	26
29							-	46	72	47	33	26
30					------		†16	59	69	38	32	27
31		------			------		------	69	------	36	32	------
Total							-	-	2,718	1,637	1,170	810
Mean							-	-	90.6	52.8	37.7	27.0
Cfsm							-	-	10.5	6.14	4.38	3.14
In.							-	-	11.75	7.08	5.06	3.50
Ac-ft							-	-	5,390	3,250	2,320	1,610

Calendar year	: Max	Min	Mean	Cfsm	In.	Ac-ft
Water year	: Max	Min	Mean	Cfsm	In.	Ac-ft

Peak discharge (base, 100 cfs).--June 7 (4 a.m.) 178 cfs (3.05 ft); June 21 (9 a.m.) 193 cfs (3.13 ft).

* Discharge measurement made on this day.
† Result of discharge measurement.

2610. Cooper Creek at mouth, near Cooper Landing

Location.--Lat 60°28'30", long 149°52'30", on right bank 0.7 mile upstream from mouth, 0.9 mile downstream from unnamed tributary, 1.6 miles west of Cooper Landing, and 4½ miles downstream from Cooper Lake Outlet.

Drainage area.--48.0 sq mi.

Records available.--Discharge: October 1957 to September 1958.
Chemical analyses: October 1957 to August 1958.

Gage.--Water-stage recorder. Altitude of gage is 450 ft (from topographic map).

Extremes.--Maximum discharge during year, 608 cfs June 22 (gage height, 2.91 ft); maximum gage height recorded, 3.41 ft Dec. 21 (ice jam); minimum discharge not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	220		140				31	128	269	392	221	184
2	200		140				32	148	295	384	221	174
3	200	490	130				34	156	*303	387	217	169
4	180		120				*35	171	301	392	209	167
5	170		120		(*)		36	169	339	402	201	169
6	170		*b118				36	178	404	390	193	162
7	150		b114		(*)		38	174	452	367	*193	156
8	150	390	b107	63	37		40	178	472	*353	195	155
9	140		b107				41	172	454	346	199	151
10	140		b102				41	172	422	337	199	148
11	140		b99				41	174	412	319	205	146
12	130		b95				41	174	414	306	241	150
13	130	250	b91				42	178	400	299	273	148
14	130		b84				42	176	365	292	303	*148
15	120		b78				42	176	339	279	303	146
16	160		73			28	42	178	351	292	292	139
17	180		69				43	180	344	314	271	131
18	312	220	b66				44	169	351	326	252	122
19	*330		b62				45	180	402	312	233	133
20	336		b60				46	187	508	299	221	122
21	441		b58				48	199	575	279	217	116
22	516		56		27		50	201	596	277	219	133
23	442	210	55				53	205	543	279	215	169
24	*390		54	55			56	203	491	269	233	167
25	351		54				62	201	475	250	237	167
26	330		54				70	201	447	241	225	162
27	320		54				78	197	434	254	213	153
28	320	150	53				92	195	417	258	205	148
29	400		*53		-		96	201	404	246	195	151
30	500		b52		------		*112	237	392	219	195	150
31	490	------	b52		------		------	252	------	221	186	------
Total	8,188	8,550	2,570	1,825	906	868	1,509	5,710	12,371	9,581	6,982	4,536
Mean	264	285	82.9	58.9	32.4	28	50.3	184	412	309	225	151
Cfsm	5.50	5.94	1.73	1.23	0.675	0.583	1.05	3.83	8.58	6.44	4.69	3.15
In.	6.34	6.62	1.99	1.41	0.70	0.67	1.17	4.42	9.58	7.42	5.41	3.51
Ac-ft	16,240	16,960	5,100	3,620	1,800	1,720	2,990	11,330	24,540	19,000	13,850	9,000

Calendar year 1957: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1957-58: Max 596 Min - Mean 174 Cfsm 3.62 In. 49.24 Ac-ft 126,200

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Oct. 1-17, Oct. 26 to Dec. 5, Dec. 16, 17, 22-29, Jan. 2 to Apr. 3, Apr. 20-27 (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 7 discharge measurements, weather records, and records for station near Cooper Landing and Crescent Creek near Moose Pass.

2610. COOPER CREEK AT MOUTH, NEAR COOPER LANDING--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silics (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluorids (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 3, 1957	200	3.8	0.03	12	1.2	1.1	0.3	38	3.5	1.0	0.0	1.1	43	34	4	73	7.1	5
Nov. 6	390	4.9	.02	12	.6	1.7	.6	36	4.0	1.2	.0	2.1	45	32	3	77	7.2	0
Dec. 11	99	4.1	.03	12	.9	1.4	.3	40	3.0	1.0	.1	1.8	45	34	0	77	7.1	5
Jan. 22, 1958	55	4.1	.02	13	1.0	2.5	1.4	41	5.0	1.5	.0	1.4	50	36	3	81	7.0	0
Feb. 19	27	6.2	.02	13	2.7	1.6	.4	43	8.0	2.0	.0	1.0	56	44	4	90	7.0	0
May 20	187	4.9	.04	12	2.1	1.2	.4	35	6.0	2.0	.0	3.2	49	38	10	72	7.1	5
July 15	279	4.0	.03	10	2.6	1.2	.2	34	5.0	2.5	.2	1.0	44	36	8	71	6.4	0
Aug. 21	217	3.9	.03	11	1.0	1.0	.2	36	4.0	1.0	.1	.9	41	32	2	74	6.8	0

2740. South Fork Campbell Creek near Anchorage

Location.--Lat 61°10'00", long 149°46'30", in NE¼ sec.3, T.12 N., R.3 W., on right bank a quarter of a mile downstream from bridge on road leading to Campbell airstrip, 2.0 miles upstream from North Fork Campbell Creek, and 5½ miles southeast of Anchorage Post Office. Prior to July 16, 1958, at site a quarter of a mile upstream.

Drainage area.--29.4 sq mi.

Records available.--July 1947 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 260 ft (from topographic map). Prior to Aug. 20, 1952, at site a quarter of a mile upstream at different datum. Aug. 20, 1952, to July 15, 1958, at site 70 ft downstream from previous site at different datum.

Average discharge.--11 years, 38.1 cfs (27,580 acre-ft per year).

Extremes.--Maximum discharge during year, 160 cfs June 7 (gage height, 1.62 ft); maximum gage height observed, 1.88 ft Dec. 23 (backwater from ice); minimum daily discharge, 9 cfs Mar. 13-16, 22-24, Mar. 26 to Apr. 2.
1947-58: Maximum discharge, 891 cfs June 21, 1949 (gage height, 3.30 ft, site and datum then in use), from rating curve extended above 110 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	42	29			12	*9	22	99	64	46	38
2	68	42	27			12	9	24	106	61	a80	45
3	64	41	26			12	10	24	99	a62	a110	46
4	*58	47	25			11	10	22	88	a62	a97	*43
5	54	41	*27			11	10	22	*94	a58	a92	40
6	52	40	26	(*)		11	10	21	*142	a53	a90	39
7	49	40	25			11	10	21	147	a46	a94	42
8	48	*38	19		15	10	10	21	143	*41	a90	36
9	47	36	20			10	10	21	127	a41	a100	35
10	51	36	*22		(*)	11	10	22	102	a41	a92	35
11	60	36	24			*10	10	25	102	a39	a84	36
12	51	36	26			10	10	26	99	a38	a84	*37
13	45	35	26	(*)		9	10	*26	90	a37	*77	35
14	48	34	25			9	11	26	81	a36	68	35
15	47	32	23			9	10	25	81	a35	64	32
16	61	34	22	15		9	11	26	125	84	61	32
17	*49	35	21		(*)	10	11	25	102	108	59	31
18	57	34	20			11	*11	26	97	83	57	31
19	57	35	20			10	10	28	116	71	54	37
20	53	35	19			10	10	32	135	60	50	35
21	*54	34	19			10	10	41	138	50	52	32
22	54	*29	18		11	9	10	51	106	47	*49	34
23	48	25	*18			9	10	57	*90	46	50	36
24	47	26	17	(*)		9	10	56	83	45	52	37
25	43	24	17			10	11	52	78	39	56	*35
26	45	30	16		(*)	*9	11	47	74	43	53	31
27	45	30	16			9	15	42	72	53	47	37
28	*52	29	15			9	17	41	68	56	43	34
29	54	30	15			9	*20	45	67	*53	40	31
30	48	29	14		-------	9	20	62	67	49	42	35
31	43	-------	14		-------	9	-------	84	-------	45	38	-------
Total	1,622	1,035	651	465	368	309	336	1,063	3,018	1,646	2,071	1,082
Mean	52.3	34.5	21.0	15	13.1	10.0	11.2	34.3	101	53.1	66.8	36.1
Ac-ft	3,220	2,050	1,290	922	730	613	666	2,110	5,990	3,260	4,110	2,150

Calendar year 1957: Max 129 Min 6 Mean 36.1 Ac-ft 26,150
Water year 1957-58: Max 147 Min 9 Mean 37.4 Ac-ft 27,110

Peak discharge (base, 150 cfs).--June 7 (12:30 a.m.) 160 cfs (1.62 ft); June 16 (11 a.m.) 155 cfs (1.58 ft); June 21 (4 a.m.) 150 cfs (1.56 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 2 discharge measurements, weather records, and records for Ship Creek near Anchorage.
Note.--Stage-discharge relation affected by ice Nov. 23 to about Apr. 15 (no gage-height record Nov. 27 to Dec. 4, Dec. 20 to Mar. 16, except occasional staff-gage readings; discharge estimated on basis of 9 discharge measurements, weather records, and records for Ship Creek near Anchorage).

2750. Chester Creek at Anchorage

Location.--Lat 61°12'00", long 149°50'10", in SW¼ sec.21, T.13 N., R.3 W., on right bank 50 ft upstream from bridge on Lake Otis Road, 2.3 miles southeast of post office in Anchorage, and 3.2 miles upstream from mouth.

Drainage area.--21.3 sq mi.

Records available.--July to September 1958.

Gage.--Staff gage read twice daily. Altitude of gage is 100 ft (from topographic map).

Extremes.--Maximum discharge during period July to September, 42 cfs Aug. 3 (gage height, 2.16 ft); minimum, 18 cfs July 7, 15 (gage height, 1.54 ft).

Remarks.--Records good.

Discharge, in cubic feet per second, July to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							†14.6		-	20	29.5	24.5
2							-		-	20	39.5	25
3							-		-	19	42	25
4							-		-	19	37	*24.5
5							-		-	19	33.5	25
6							-		†19.0	18.5	33	24
7							-		-	18	33	24.5
8							-		-	*18.5	31.5	24.5
9							-		-	19	34	24
10							-		-	20	32	23.5
11							-		-	19.5	31	23.5
12							-		-	18.5	29.5	*23.5
13							-		-	18.5	*29.5	23.5
14							-	†18.4	-	18.5	29	23.5
15							-		-	18	28.5	23
16							-		-	21	28	22.5
17							-		-	33.5	28	22.5
18							†20.2		-	31.5	28	22
19							-		-	29	27	23
20							-		-	27	26.5	23
21							-		-	26	26	22.5
22							-		-	25	*25.5	22
23							-		-	25	25.5	22.5
24							-		-	25.5	26	23.5
25							-		-	25	27.5	*22.5
26						†14.2	-		†22.6	25.5	27	21.5
27							-		-	36	26	22.5
28							-		-	37	25.5	21.5
29							†16.4		-	*33.5	25	21.5
30					------		-		-	32	25	21.5
31		------			------		------		------	29.5	24.5	------
Total							-		-	746.0	913.5	696.0
Mean							-		-	24.1	29.5	23.2
Ac-ft							-		-	1,480	1,810	1,380

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

* Discharge measurement made on this day.
† Result of discharge measurement.

2760. Ship Creek near Anchorage

Location.--Lat 61°13'25", long 149°38'00", in Fort Richardson Military Reservation, at new diversion dam and Fort Richardson water-supply intake building, 0.2 mile upstream from abandoned dam and water-supply intake building, 3.5 miles upstream from North Fork Ship Creek, and 8½ miles east of Anchorage.

Drainage area.--91.2 sq mi.

Records available.--Discharge: October 1946 to September 1958.
Chemical analyses: April 1949 to July 1951.
Water temperatures: May 1949 to September 1950.

Gage.--Water-stage recorder and masonry dam. Datum of gage is 530 ft above mean sea level (levels by Corps of Engineers). Oct. 1, 1946, to Apr. 30, 1947, staff gage and May 1, 1947, to Apr. 19, 1954, water-stage recorder, at site 0.2 mile downstream at different datum. June 18, 1953, to Sept. 30, 1954, supplementary water-stage recorder at site 2.7 miles downstream at different datum.

Average discharge.--12 years, 142 cfs (102,800 acre-ft per year).

Extremes.--Maximum discharge during year, 874 cfs June 7 (gage height, 3.41 ft); no flow for parts of several days.
1946-58: Maximum discharge, 1,860 cfs June 21, 1949 (gage height, 3.44 ft, site and datum then in use); no flow at times.

Remarks.--Records good except those for periods of ice effect or shifting control, which which are fair. Discharge data represent net flow remaining after diversion for water supply of Fort Richardson, Elmendorf Air Force Base, and city of Anchorage. Average annual diversion, 19.3 cfs.

Cooperation.--Gage inspected and records of diversion furnished by Office of Post Engineers, Fort Richardson.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	236	133	88	40	25	26	*22	80	596	248	186	146
2	228	138	82	42	24	24	24	89	634	248	269	146
3	211	134	77	45	27	21	25	100	631	258	376	142
4	*202	146	70	50	31	18	27	102	610	258	337	*138
5	193	134	*76	54	29	18	25	92	*600	256	317	134
6	181	131	71	*53	31	25	25	94	694	244	309	133
7	172	125	70	50	13	13	26	90	798	224	323	148
8	165	*122	55	46	16	18	27	88	726	*211	303	140
9	161	118	62	42	12	25	29	86	656	214	360	125
10	167	120	*70	40	*29	23	28	94	519	218	325	116
11	179	116	76	39	26	*22	27	100	464	206	303	134
12	161	115	78	38	34	22	27	106	413	190	303	*134
13	148	108	74	*38	29	19	29	*110	370	186	*289	129
14	142	105	69	39	31	18	30	118	328	181	272	123
15	144	100	66	39	27	20	30	116	314	172	251	116
16	165	102	62	40	28	16	30	116	419	248	234	113
17	*150	106	59	42	*30	10	30	116	360	354	221	111
18	165	97	56	44	18	23	*30	115	348	306	206	108
19	181	100	53	45	12	23	28	122	385	269	200	116
20	179	102	51	45	35	19	28	144	480	231	188	111
21	*186	100	48	39	29	23	26	167	586	216	183	108
22	186	*84	47	40	31	16	24	211	474	218	*188	103
23	179	70	45	44	30	23	25	236	382	206	179	105
24	170	73	44	*42	27	24	27	248	337	195	181	102
25	161	67	43	44	24	21	34	241	320	181	190	*97
26	157	90	42	42	*24	*17	40	241	*317	179	172	103
27	152	88	41	35	23	20	49	231	306	206	163	111
28	*165	86	41	29	25	15	56	234	292	214	157	102
29	174	89	40	28	-	23	*63	254	278	*204	152	98
30	154	88	40	28	-------	14	67	334	258	188	146	100
31	125	-------	40	24	-------	19	-------	474	-------	183	144	-------
Total	5,339	3,187	1,836	1,266	720	618	958	4,949	13,895	6,912	7,427	3,592
Mean	172	106	59.2	40.8	25.7	19.9	31.9	160	463	223	240	120
Ac-ft	10,590	6,320	3,640	2,510	1,430	1,230	1,900	9,820	27,560	13,710	14,730	7,120

Calendar year 1957: Max 673 Min 4 Mean 128 Ac-ft 91,560
Water year 1957-58: Max 798 Min 10 Mean 139 Ac-ft 100,600

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 9 to Jan. 19, Feb. 23 to Apr. 10. Shifting-control method used Jan. 20 to Feb. 21.

2780. Eklutna Lake near Palmer

Location.--Lat 61°24'05", long 149°09'00", 100 ft upstream from dam at outlet of Eklutna Lake, 8 miles upstream from abandoned Eklutna power diversion dam, 11 miles upstream from mouth of Eklutna Creek, and 14 miles south of Palmer.

Drainage area.--119 sq mi.

Records available.--November 1946 to September 1958 (fragmentary since January 1955).

Gage.--Staff gage. Datum of gage is 859.8 ft above mean sea level (Corps of Engineers bench mark). Prior to May 5, 1947, reference point at same site and datum.

Extremes.--Maximum gage height observed during year, 10.17 ft Aug. 26; minimum observed, -21.25 ft May 29.
1946-58: Maximum gage height observed, 12.00 ft Sept. 18, 1951; minimum observed, -22.45 ft May 17, 1957.

Remarks.--Outflow from lake controlled by stoplogs and sluice gates in dam at outlet. Gates fully open during flood season each year. Prior to December 1954, stored water released during winter period for power purposes. Since December 1954, direct withdrawals from Eklutna Lake for power purposes; flow then diverted into Knik River basin.

Gage height, in feet, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-	-	-	-	-	-	-	-	-	-
2	9.92	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	0.53	-	-	-	-	-	-	-	9.61
4	-	-	-	-	-	-	-	-	-	-	6.71	9.57
5	-	-	-	-	-	-	-	-	-19.92	-	7.09	-
6	-	-	4.89	-	-	-	-	-	-	-	7.51	-
7	9.63	8.34	-	-	-4.77	-9.01	-	-	-	-6.78	7.91	-
8	9.51	-	-	-	-	-	-14.19	-19.38	-	-	8.31	-
9	9.42	-	-	-	-	-	-	-	-	-	-	-
10	9.38	-	-	-0.47	-	-	-	-	-	-	-	-
11	9.30	-	-	-	-	-	-	-	-	-	-	9.31
12	-	-	-	-	-	-	-	-	-16.52	-	-	-
13	-	-	3.91	-	-	-	-	-	-	-	8.61	9.31
14	-	7.56	-	-	-5.86	-10.02	-	-	-	-	8.61	-
15	-	-	-	-	-	-	-	-	-	-3.75	8.61	-
16	-	-	-	-	-	-	-15.73	-19.78	-	-	-	-
17	9.05	-	-	-1.68	-	-	-	-	-	-	-	9.01
18	-	-	-	-	-	-	-	-	-	-1.39	8.61	8.92
19	-	-	-	-	-	-	-	-	-15.33	-	8.71	-
20	-	-	2.76	-	-	-	-	-	-	-	8.91	-
21	-	-	-	-	-6.85	-11.03	-	-	-	-	9.11	-
22	-	6.76	-	-	-	-	-	-	-	-	-	8.41
23	-	-	-	-	-	-	-	-20.68	-	-	-	8.47
24	-	-	-	-2.61	-	-	-17.19	-	-	-	-	8.21
25	9.18	-	-	-	-	-	-	-	-12.91	2.01	-	-
26	-	-	-	-	-	-	-	-	-	-	10.17	7.96
27	-	-	-	-	-	-	-	-	-	-	10.11	-
28	-	-	-	-	-7.92	-	-	-	-	-	10.03	-
29	-	5.74	-	-	-	-	-	-21.25	-	-	9.94	-
30	-	-	1.09	-	-------	-	-18.15	-	-10.77	-	-	7.31
31	8.84	-------	-	-3.75	-------	-12.74	-------	-	-------	4.86	-	-------

2800. Eklutna Creek near Palmer

Location.--Lat 61°24'05", long 149°09'00", on right bank 200 ft downstream from dam at outlet of Eklutna Lake, 8 miles upstream from abandoned Eklutna power diversion dam, 11 miles upstream from mouth, and 14 miles south of Palmer.

Drainage area.--119 sq mi.

Records available.--Discharge: October 1946 to September 1958.
Chemical analyses: April 1949 to September 1950, December 1950 to August 1952.
Water temperatures: May 1949 to September 1950, December 1950 to July 1951.

Gage.--Water-stage recorder. Datum of gage is 856.53 ft above mean sea level (Corps of Engineers bench mark). Prior to Aug. 31, 1948, staff gage at site 100 ft upstream at datum 1.96 ft higher. Aug. 31, 1948, to Sept. 30, 1953, at datum 1.96 ft higher.

Average discharge.--8 years (1946-54), 346 cfs (250,500 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 910 cfs Aug. 12 (gage height, 3.99 ft); no flow Nov. 7 to Aug. 2, Sept. 5-30.
1946-58: Maximum discharge, 2,530 cfs Sept. 18, 1951 (gage height, 8.06 ft in gage well, present datum); no flow for long periods since December 1954.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by Eklutna Lake (usable capacity, 160,000 acre-ft). Since December 1954, entire flow, except for periods of spilling, diverted from Eklutna Lake into Knik River basin by Eklutna powerplant.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	1									0	171
2	25	1								(*)	0	*66
3	23	1									10	10
4	21	1									53	5
5	19	1									95	0
6	18	1									*155	0
7	16	0									221	0
8	15	*0									472	0
9	14	0									759	0
10	13	0									866	0
11	12	0									866	0
12	11	0									810	0
13	10	0									742	0
14	9	0									738	0
15	*8	0									656	0
16	8	0									562	0
17	7	0									432	0
18	6	0									186	0
19	6	0									26	0
20	5	0									25	0
21	29	0									37	0
22	16	0									113	0
23	10	0									210	0
24	7	0									359	0
25	5	0									*393	0
26	4	0									359	0
27	3	0									292	0
28	2	0									239	0
29	2	0									203	0
30	2	0									188	0
31	1										175	
Total	354	6	0	0	0	0	0	0	0	0	10,242	252
Mean	11.4	0.20	0	0	0	0	0	0	0	0	330	8.40
Ac-ft	702	12	0	0	0	0	0	0	0	0	20,310	500
(†)	16,040	17,450	19,500	18,310	15,220	16,320	19,920	21,840	20,170	20,890	20,480	21,050

Calendar year 1957: Max 1,200 Min 0 Mean 111 Ac-ft 80,400 † 217,100
Water year 1957-58: Max 866 Min 0 Mean 29.7 Ac-ft 21,520 † 227,200

* Discharge measurement or observation of no flow made on this day.
† Diversion above station, in acre-feet, for Eklutna powerplant; records furnished by Bureau of Reclamation.
Note.--No gage-height record Oct. 1-9, 11-20, Oct. 23 to Nov. 6, Aug. 3, Sept. 3, 4; discharge estimated on basis of 3 discharge measurements or observations of no flow.

2820. Caribou Creek near Sutton

Location.--Lat 61°48'10", long 147°41'00", on downstream side of left pier of bridge on Glenn Highway, 1.4 miles downstream from Dan Creek, 1¾ miles upstream from mouth, and 40 miles east of Sutton.

Drainage area.--289 sq mi.

Records available.--Discharge: May 1955 to September 1958.
Chemical analyses: October 1957 to August 1958.

Gage.--Water-stage recorder. Datum of gage is 1,767 ft above mean sea level.

Extremes.--Maximum discharge during year, 3,420 cfs June 1 (gage height, 5.25 ft); minimum observed, 17 cfs Feb. 11 (discharge measurement).
1955-58: Maximum discharge, 5,060 cfs June 18, 1955 (gage height, 5.92 ft); minimum observed, 0.23 cfs Mar. 9, 1956 (discharge measurement), caused by temporary storage upstream.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*226							180	1,820	135	415	218
2	241							190	a1,500	132	451	212
3	241							190	a1,100	132	512	210
4	247							180	a840	130	486	204
5	253							180	697	126	394	232
6	238							180	1,040	124	466	232
7	224							170	a800	122	1,150	229
8	215	80	78	40	27	31	46	180	a600	116	1,040	235
9	210							180	428	114	690	229
10	204							183	*301	114	512	226
11	196				(*)			204	284	110	433	226
12	*188	(*)	(*)					212	308	106	390	226
13	160							204	284	103	361	215
14	116							212	210	101	328	212
15	110						(*)	215	188	99	304	207
16	100							224	188	112	294	199
17	95					(*)		212	207	120	365	191
18	92							218	186	114	386	191
19	90							284	207	142	365	186
20	88							*346	215	139	365	183
21	92							481	204	137	346	176
22	96			(*)	34			622	170	*142	321	178
23	94	71	44	37		28	88	601	158	135	311	176
24	90							504	142	128	294	170
25	86							540	142	130	*281	153
26	84							512	142	124	268	153
27	82		(*)					311	181	120	259	158
28	81							331	156	118	250	135
29	81				-			778	144	137	244	*137
30	80				-------			1,420	137	210	232	153
31	80	-------			-------		-------	1,450	-------	394	224	-------
Total	4,480	2,265	1,874	1,192	847	913	2,010	11,694	12,979	4,166	12,737	5,852
Mean	145	75.5	60.5	38.5	30.2	29.5	67.0	377	433	134	411	195
Ac-ft	8,890	4,490	3,720	2,360	1,680	1,810	3,990	23,190	25,740	8,260	25,260	11,610

Calendar year 1957: Max 2,600 Min - Mean 326 Ac-ft 235,700
Water year 1957-58: Max 1,820 Min - Mean 167 Ac-ft 121,000

Peak discharge (base, 2,000 cfs).--June 1 (8 p.m.) 3,420 cfs (5.25 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Little Susitna River near Palmer.
Note.--Stage-discharge relation affected by ice Oct. 15 to May 9 (no gage-height record Nov. 24 to Apr. 14, Apr. 22, 23; discharge estimated on basis of 6 discharge measurements, weather records, and records for Little Susitna River near Palmer).

2820. CARIBOU CREEK NEAR SUTTON--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 19, 1957	90	11	0.02	49	8.4	20	1.1	128	88	4.5	0.1	0.7	246	157	52	407	7.6	3
Jan. 6, 1958	40	9.8	.03	60	9.9	24	1.3	146	106	7.5	.1	1.4	292	190	70	455	7.9	0
Feb. 14	27	10	.02	59	13	25	.7	154	111	8.5	.0	.1	303	200	74	481	7.8	0
May 8	180	6.0	.22	25	5.7	12	1.1	74	44	2.0	.2	.3	132	86	26	211	7.3	120
June 5	697	8.1	.14	21	3.8	7.7	.6	63	27	2.0	.3	.4	102	68	16	161	7.4	5
June 26	142	9.6	.08	29	14	18	.6	102	73	4.0	.3	.1	199	130	46	328	7.5	5
Aug. 29	244	9.3	.07	47	11	21	1.1	108	101	5.5	.2	.3	249	162	74	377	7.8	0

2840. Matanuska River at Palmer

Location.--Lat 61°36'35", long 149°04'15", in N½ sec.34, T.18 N., R.2 E., on left bank 100 ft downstream from bridge on Glenn Highway and 1 mile east of Palmer.

Drainage area.--2,070 sq mi, approximately.

Records available.--Discharge: April 1949 to September 1958.
Chemical analyses: May 1949 to October 1950, April to June 1951, October 1951 to July 1953, October 1957 to August 1958.
Water temperatures: March to August 1952, April to September 1953.
Sediment records: April to September 1953, April to September 1954.

Gage.--Water-stage recorder. Datum of gage is 170.92 ft above mean sea level (Alaska Road Commission bench mark). Prior to Nov. 2, 1950, wire-weight gage at bridge 120 ft upstream at same datum. Nov. 2, 1950, to Apr. 30, 1952, wire-weight gage at bridge 100 ft upstream at same datum.

Average discharge.--9 years, 4,075 cfs (2,950,000 acre-ft per year).

Extremes.--Maximum discharge during year, 17,500 cfs July 5; maximum gage height, 9.60 ft June 8; minimum daily discharge, 450 cfs Mar. 20-25.
1949-58: Maximum discharge, 25,900 cfs June 20, 1957 (gage height, 10.90 ft); maximum gage height observed, 12.03 ft July 11, 1949; minimum daily discharge, 234 cfs Apr. 25, 1956.

Remarks.--Records fair except those for period of ice effect, which are poor. Large diurnal fluctuation caused by glacier melt at the source.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,730	1,540	910	630	540	520	610	2,120	9,050	11,500	12,500	5,140
2	3,470	1,510	925	670	540	530	640	2,100	9,960	12,800	13,000	4,940
3	*3,320	1,500	930	700	530	540	610	1,940	10,100	13,800	11,200	4,220
4	3,160	1,650	925	740	540	530	660	1,920	10,900	15,000	10,100	3,900
5	3,040	1,570	892	770	550	520	720	1,690	10,900	15,600	9,720	*3,980
6	2,960	1,440	*870	790	570	500	700	1,510	11,900	15,600	10,100	4,180
7	2,850	1,420	820	800	580	480	730	1,500	13,900	*15,300	*12,000	4,080
8	2,760	1,380	770	*800	570	470	740	1,580	13,800	13,900	12,800	4,040
9	2,720	1,380	720	770	560	470	790	1,440	13,000	11,900	12,600	3,900
10	2,690	1,300	690	710	540	480	640	1,420	11,100	10,200	11,300	3,790
11	2,640	1,260	650	650	*530	489	620	1,380	11,100	9,880	11,000	3,630
12	2,560	1,250	620	600	540	500	620	1,400	*10,600	9,160	11,800	3,430
13	2,400	1,190	600	570	550	*489	740	1,390	10,100	8,580	11,100	3,500
14	2,200	1,090	580	550	560	480	*740	*1,350	9,200	8,940	10,700	3,500
15	*2,180	*1,050	550	560	560	470	770	1,340	8,520	8,730	10,000	3,480
16	2,220	1,110	534	600	550	470	810	1,370	8,200	8,730	9,270	3,360
17	2,180	1,310	516	670	530	471	810	1,310	7,740	*9,350	9,270	3,140
18	2,130	1,170	510	730	510	462	850	1,390	7,870	9,880	8,310	2,960
19	2,100	1,020	507	750	500	460	860	1,570	8,910	9,690	*7,540	2,800
20	2,010	947	*507	760	490	450	860	1,760	10,200	9,310	7,610	2,660
21	2,010	892	520	730	500	450	800	1,830	11,000	9,690	7,540	2,470
22	2,010	850	550	690	510	450	730	2,240	10,300	10,300	7,510	2,310
23	1,960	820	570	*660	520	450	740	2,600	9,500	8,980	7,540	2,260
24	1,880	800	570	620	530	450	850	2,610	9,380	7,900	7,160	2,300
25	1,810	780	540	590	520	450	1,000	2,550	*9,570	6,650	6,280	2,140
26	1,760	780	520	580	500	460	1,110	*2,770	10,600	6,920	5,690	2,010
27	1,690	*810	516	570	490	*480	1,290	2,470	11,400	7,640	5,460	2,080
28	1,670	840	520	560	*510	490	1,570	2,400	11,500	9,350	5,300	1,890
29	*1,670	870	530	560	-	520	1,900	3,040	11,100	10,500	5,280	1,750
30	1,640	900	550	550	-------	550	*2,220	4,400	10,900	12,100	5,120	1,750
31	1,570	-------	580	540	-------	570	-------	7,320	-------	12,800	5,090	-------
Total	72,990	34,429	19,992	20,470	14,920	15,101	26,730	65,710	312,300	330,680	279,890	95,590
Mean	2,355	1,148	645	660	533	487	891	2,120	10,410	10,670	9,029	3,186
Ac-ft	144,800	68,290	39,650	40,600	29,590	29,950	53,020	130,300	619,400	655,900	555,200	189,600

Calendar year 1957: Max 22,500 Min - Mean 4,914 Ac-ft 3,557,000
Water year 1957-58: Max 15,600 Min 450 Mean 3,531 Ac-ft 2,556,000

Peak discharge (base, 16,500 cfs).--July 5 (4 a.m.) 17,500 cfs (9.05 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice from about Nov. 16 to about Mar. 31 (no gage-height record Nov. 23, 24, 26, Nov. 28 to Dec. 1, Dec. 3, 8, 12, 14, 15, 18, 21, 22, 24-26, Dec. 28 to Jan. 7, Jan. 10-15, 20, 25, 26, Feb. 1, 8, 9, 12, 13, 15, 16, 22, 23, Mar. 1-9, 12, 14-16, 19-25, 28-30; discharge estimated on basis of 10 discharge measurements and weather records).

2840. MATANUSKA RIVER AT PALMER--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 2, 1957	a3,410	5.5	0.02	32	5.1	6.2	0.8	75	48	2.5	0.0	0.1	137	112	51	218	6.9	0
Nov. 5	a1,440	8.8	.04	36	5.8	7.0	.6	87	46	3.5	.2	.9	152	114	43	252	7.7	0
Dec. 10	610	7.0	.04	40	5.5	8.3	1.3	97	49	5.0	.1	1.5	166	122	43	275	7.6	0
Jan. 24, 1958	620	7.3	.02	35	8.7	7.5	.7	103	40	7.0	.0	1.1	158	124	39	275	7.6	5
Feb. 21	500	6.7	.02	41	4.9	7.2	.7	96	40	6.0	.1	1.4	155	122	44	282	7.4	0
May 21	a1,890	5.4	.05	31	3.8	6.8	.7	80	37	3.0	.1	.6	127	93	28	215	7.2	10
July 16	a8,730	4.2	.08	25	2.4	2.5	.4	58	24	3.5	.0	.4	90	72	25	156	6.6	0
Aug. 12	a11,600	4.5	.02	28	1.8	3.8	.9	61	29	2.5	.0	.1	94	77	27	169	7.0	10

a Discharge at time of sampling.

2900. Little Susitna River near Palmer

Location.--Lat 61°42'40", long 149°13'40", in NW¼ sec.26, T.19 N., R.1 E., on left bank 15 ft downstream from highway bridge on Wasilla-Fishhook road, 1.5 miles north of road junction, 1.8 miles downstream from unnamed tributary, and 8 miles northwest of Palmer.

Drainage area.--61.9 sq mi.

Records available.--Discharge: July 1948 to September 1958.
Chemical analyses: February to August 1952.

Gage.--Water-stage recorder. Datum of gage is 920.6 ft above mean sea level (river-profile survey). Prior to Aug. 16, 1948, staff gage at same site and datum.

Average discharge.--10 years, 200 cfs (144,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,280 cfs May 31 (gage height, 4.95 ft); minimum observed, 9.6 cfs Mar. 27 (discharge measurement).
1948-58: Maximum discharge, 3,070 cfs June 21, 1949 (gage height, 6.33 ft); minimum not determined.

Remarks.--Records good except those for period of ice effect, which are poor. Large diurnal fluctuation caused by glacier melt at the source.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	344	116					14	48	1,020	192	359	165
2	304	112					15	48	893	207	590	154
3	*270	109					15	52	822	227	668	151
4	252	116			(*)		16	46	695	227	505	146
5	232	112					16	43	612	218	440	156
6	214	107	(*)				16	44	809	241	440	154
7	201	103					16	52	755	*214	*485	160
8	192	97	55	27	24	16	16	54	640	199	436	152
9	184	94		(*)			16	54	476	190	454	*142
10	184	94					16	56	355	194	383	136
11	186	90					16	60	326	184	326	132
12	171	86					16	66	*316	171	375	130
13	156	83				(*)	16	79	262	177	326	126
14	151	80					*17	*87	234	181	291	124
15	*160	*77					17	82	221	167	275	121
16	147	80					17	81	285	352	254	116
17	142	82					17	78	239	*406	239	114
18	139	78					17	83	225	262	*225	108
19	134	78					17	94	270	227	216	109
20	130	75	(*)				16	119	304	225	210	108
21	137	68					16	154	272	254	203	103
22	144	60			17		16	207	227	239	190	100
23	136	54		(*)			17	232	209	212	182	112
24	131	49	32	22	(*)	13	20	223	203	190	181	111
25	128	49					23	254	221	182	210	102
26	124	54					27	241	*241	181	184	103
27	122	*56				(*)	31	*205	225	365	169	119
28	122	60					*37	221	214	396	171	103
29	*119	62			-		45	321	196	326	162	98
30	116	62			-------		45	598	186	297	152	103
31	112	-------			-------		-------	906	-------	348	146	-------
Total	5,284	2,443	1,337	757	581	448	599	4,888	11,953	7,451	9,447	3,758
Mean	170	81.4	43.1	24.4	20.8	14.5	20.0	158	398	240	305	125
Ac-ft	10,480	4,850	2,650	1,500	1,150	889	1,190	9,700	23,710	14,780	18,740	7,450

Calendar year 1957: Max 1,880 Min 8 Mean 207 Ac-ft 149,900
Water year 1957-58: Max 1,020 Min - Mean 134 Ac-ft 97,090

Peak discharge (base, 1,500 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 6 to about Apr. 23 (no gage-height record Dec. 13-15, Dec. 19 to Apr. 2, except twice-monthly staff-gage readings, Apr. 23; discharge estimated on basis of 7 discharge measurements, weather records, and records for Ship Creek near Anchorage).

2910. Susitna River near Denali

Location.--Lat 63°04'40", long 147°31'20", on left bank 1.4 miles upstream from Butte Creek, 2.3 miles downstream from bridge on Denali Highway, 2.6 miles downstream from Windy Creek, and 7½ miles south of Denali.

Drainage area.--950 sq mi, approximately.

Records available.--Discharge: May 1957 to September 1958.
Chemical analyses: December 1957 to September 1958.
Sediment records: June to September 1958 (periodic).

Gage.--Water-stage recorder. Altitude of gage is 2,450 ft (from topographic map).

Extremes.--Maximum discharge during year, 14,500 cfs July 28 (gage height, 4.74 ft); minimum not determined.
1957-58: Maximum gage height, 5.54 ft June 7, 1957, from floodmarks (discharge not determined); minimum discharge not determined.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Large diurnal fluctuation caused by glacier melt at the source.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,920							570	6,000	8,730	10,100	2,860
2	1,920							640	6,970	9,400	9,880	*3,260
3	1,860						(*)	700	7,040	9,360	9,310	2,900
4	1,760							740	7,120	9,360	9,700	2,540
5	1,700							780	7,150	9,150	9,480	2,690
							140					
6	1,650							810	7,800	10,400	8,680	2,360
7	1,590							830	8,000	10,900	8,680	2,300
8	1,540	740	360	250				830	7,920	10,700	8,080	2,300
9	1,520							820	7,270	10,500	7,840	2,200
10	1,490							780	7,380	9,400	7,920	2,180
11	1,460							750	8,200	8,600	7,720	2,010
12	1,400							720	8,440	8,000	7,120	1,960
13	1,320							710	8,980	7,500	7,120	2,010
14	1,240							710	8,810	7,300	7,230	2,030
15	1,230							710	*8,980	7,200	6,440	1,920
					150	120	190					
16	1,230							720	8,850	7,200	6,440	1,760
17	1,200		(*)					770	9,190	7,700	6,240	1,680
18	1,160							830	9,310	8,600	6,340	1,600
19	1,140							920	9,270	8,700	5,700	1,500
20	1,090							1,000	9,400	8,600	5,740	1,400
21	1,060							1,200	8,770	8,360	5,110	1,400
22	1,060							1,400	8,770	8,400	5,260	1,300
23	1,060	480	220	190				1,600	8,890	8,700	4,960	1,300
24	*1,020							1,700	9,060	8,800	4,780	1,400
25	948							1,700	9,100	8,500	4,600	1,300
							300					
26	842							1,600	8,940	8,600	4,400	1,200
27	615							1,600	8,940	10,000	4,170	1,200
28	803							1,600	8,850	12,200	3,860	1,300
29	920				-			1,800	8,850	*11,300	3,500	1,290
30	940			(*)	-------			2,500	8,770	10,700	3,240	1,230
31	900	-------	-------	-------	-------	-------	-------	4,000	-------	10,800	2,980	-------
Total	39,588	18,300	8,920	6,790	4,200	3,720	6,300	36,040	251,020	283,660	202,620	56,380
Mean	1,277	610	288	219	150	120	210	1,163	8,367	9,150	6,536	1,879
Ac-ft	78,520	36,300	17,690	13,470	8,330	7,380	12,500	71,480	497,900	562,600	401,900	111,800

Calendar year 1957: Max - Min - Mean - Ac-ft -
Water year 1957-58: Max 12,200 Min - Mean 2,514 Ac-ft 1,820,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 3-20, Dec. 17-21, May 6 to June 1. No gage-height record Oct. 30 to Dec. 16, Dec. 22 to May 5 (stage-discharge relation affected by ice during most of periods), July 10-20, 22-27, Sept. 7-9, 18-28; discharge estimated on basis of 3 discharge measurements, weather records, and records for station at Gold Creek, Matanuska River at Palmer, and Nenana River near Healy.

2910. SUSITNA RIVER NEAR DENALI--Continued

Chemical analyses, in parts per million, December 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Dec. 17, 1957	190	12	0.06	41	8.0	18	6.3	137	36	21	0.1	0.2	210	135	23	351	7.6	0
Apr. 3, 1958	126	13	.02	46	16	23	6.6	196	39	30	.1	.0	270	181	20	467	7.1	5
June 12	a8,770	5.7	3.0	17	2.6	2.1	2.6	52	13	3.0	.0	.2	75	53	10	121	7.2	10
July 21	a8,360	4.5	.03	19	2.9	2.2	3.4	63	13	2.0	.1	.0	78	60	8	140	7.5	0
Aug. 28	a3,860	5.4	.09	21	3.1	3.8	2.5	65	18	4.5	.2	.1	91	65	12	157	7.4	0
Sept. 24	a1,400	6.9	.02	23	6.4	7.5	2.1	83	23	9.0	.3	.2	120	84	16	199	7.9	10

a Discharge at time of sampling.

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Water discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Discharge (tons per day)
June 12, 1958	8,770	2,620	62,000
July 21	8,360	2,480	56,000
Aug. 28	4,170	832	9,370
Sept. 24	1,920	244	1,260

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment: Concentration of sample (ppm)	Suspended sediment: Concentration of suspension analyzed (ppm)	Suspended sediment: Percent finer than indicated size, in millimeters: 0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	Methods of analysis
June 12, 1958	2:30 p.m.	8,770	44	2,620	2,080	20	28	35	43	50	63	75	86		93	98	BSWCM
July 21	1:00 p.m.	8,360	50	2,480	2,020	10	14	18	26	35	50	63	80		96	99	BSWCM
Aug. 28	3:30 p.m.	4,170	44	832	1,060	14	21	24	32	40	52	66	88		99	100	BSWCM

2912. Maclaren River near Paxson

Location.--Lat 63°07'05", long 146°31'40", on left bank 1.5 miles downstream from Boulder Creek and 34 miles west of Paxson.

Drainage area.--280 sq mi, approximately.

Records available.--Discharge: June to September 1958.
Chemical analyses: June to September 1958.
Sediment records: June to September 1958 (periodic).

Gage.--Water-stage recorder. Altitude of gage is 2,900 ft (from topographic map).

Extremes.--Maximum discharge during period June to September 1958, 5,770 cfs Aug. 4 (gage height, 5.64 ft); minimum daily, 634 cfs Sept. 27.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are fair.

Discharge, in cubic feet per second June to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									3,400	2,780	3,780	*1,010
2									4,100	3,210	4,260	990
3									3,900	3,540	5,200	980
4									3,800	4,010	4,840	940
5									*3,700	4,210	4,230	892
6									4,100	4,100	4,200	863
7									4,700	3,990	4,020	863
8									5,000	3,700	3,880	892
9									4,700	3,140	4,070	872
10									4,000	3,460	3,460	844
11									3,900	2,910	3,150	816
12									3,800	2,450	2,680	816
13									3,600	2,120	2,340	816
14									3,380	2,270	2,480	816
15									2,820	2,200	2,630	816
16									*3,330	2,790	2,720	780
17									3,440	4,820	2,240	753
18									2,840	5,180	2,030	718
19									2,840	5,270	2,040	701
20									3,540	4,180	2,420	692
21									4,120	3,560	2,310	692
22									3,620	3,320	2,260	667
23									3,030	3,200	1,940	658
24									2,720	2,490	1,730	692
25									2,760	2,160	1,450	676
26									2,880	2,060	1,340	650
27									3,100	2,730	1,320	634
28									3,090	*4,630	1,260	658
29									3,000	5,570	1,200	667
30					-------				2,760	4,970	1,120	650
31		-------			-------		-------		-------	4,250	1,070	-------
Total									105,970	109,270	83,670	23,514
Mean									3,532	3,525	2,699	784
Ac-ft									210,200	216,700	166,000	46,640

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

Peak discharge (base, 5,400 cfs).--June 8 (time and discharge unknown); July 19 (12:30 to 4 a.m.) 5,610 cfs (5.55 ft); July 29 (1 p.m.) 5,700 cfs (5.60 ft); Aug. 4 (12:30 a.m.) 5,770 cfs (5.64 ft).

* Discharge measurement made on this day.

Note.--No gage-height record June 1-13; discharge estimated on basis of weather records and records for Nenana River near Healy and Matanuska River at Palmer. Doubtful gage-height record Aug. 27 to Sept. 30; discharge computed from reconstructed gage-height graph based on recorded graph, weather records, and records for Nenana River near Healy.

2912. MACLAREN RIVER NEAR PAXSON--Continued

Chemical analyses, in parts per million, June to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
June 12, 1958	3,800	4.8	0.41	12	3.5	1.1	2.0	38	14	2.0	0.0	0.3	59	44	14	95	6.8	20
July 21	3,560	4.7	.02	12	3.7	1.4	2.2	42	15	.5	.0	.3	61	45	10	110	7.2	0
Aug. 28	1,260	4.4	.12	15	4.1	1.6	2.1	46	19	1.5	.2	.0	71	54	17	130	7.2	0
Sept. 24	692	6.7	.05	18	5.4	3.5	1.6	59	22	4.0	.2	.3	91	67	18	144	7.6	5

Periodic determinations of suspended-sediment June to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
June 12, 1958	a 3,800	710	7,280
July 21	3,110	596	5,000
Aug. 28	1,320	429	1,530
Sept. 21	548	59	87

a Daily mean discharge.

Particle size analyses of suspended sediment, June to September 1958
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
June 12, 1958		a 3,800	44	710	901	17	23	30	40	51	67	80	95		100		BSWCM
July 21		3,110	--	596	740	13	19	25	35	46	67	84	96		100		BSWCM

a Daily mean discharge.

2920. Susitna River at Gold Creek

Location.--Lat 62°46'15", long 149°41'20", on right bank 0.2 mile upstream from Gold Creek, 0.3 mile upstream from Alaska Railroad bridge, 1 mile north of Gold Creek railroad station, and 1.7 miles downstream from Indian River.

Drainage area.--6,160 sq mi, approximately (includes that of Gold Creek).

Records available.--Discharge: August 1949 to September 1958.
Chemical analyses: May 1951 to October 1952, October to November 1953, June to September 1955, June 1956, January to September 1957.
Water temperatures: June to September 1957.
Sediment records: April to September 1952 and June to September 1957 (daily); May 1953 to August 1956 (periodic, summer months only).

Gage.--Water-stage recorder. Datum of gage is 676.50 ft above mean sea level. Prior to June 6, 1957, wire-weight gage at site 0.3 mile downstream at same datum.

Average discharge.--9 years, 9,778 cfs (7,079,000 acre-ft per year).

Extremes.--Maximum discharge during year, 49,600 cfs Aug. 3 (gage height, 14.74 ft); maximum gage height, 14.91 ft Dec. 21 (ice jam); minimum discharge not determined.
1949-58: Maximum discharge observed, 58,100 cfs Aug. 26, 1955 (gage height, 14.20 ft), site then in use; maximum gage height observed, 24.48 ft May 10, 1954 (ice jam), site then in use; minimum discharge not determined.
Flood in May 1919 reached a stage of 19.2 ft, result of ice jam, from information by Bureau of Reclamation.

Remarks.--Records poor. Large diurnal fluctuation caused by glacier melt at source.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12,600	5,300	4,000	2,300	1,400		1,100	3,420			36,800	
2	*10,800	5,200	4,100	2,400	1,400		*1,100	4,040			42,900	
3	10,400	5,100	4,200	2,400	1,400		1,200	4,170			47,800	
4	10,000	5,000	4,300	2,500	1,400		1,200	5,110			47,100	
5	9,500	4,900	4,400	2,500	1,400		1,200	*5,550			36,000	
6	9,600	4,800	4,400	2,600	1,500		1,300	5,500			29,100	
7	9,430	4,600	4,400	2,500	1,500		1,300	6,100			28,600	
8	9,870	*4,400	4,300	2,400	1,500	1,200	1,400	7,010			a27,000	a8,500
9	9,740	4,270	4,200	2,200	1,400		1,400	7,260			a25,000	
10	9,610	4,360	4,100	2,100	1,400		1,300	9,080	a28,000		a24,000	
11	9,340	4,320	4,000	2,000	1,300		1,300	9,430			a23,000	
12	8,880	4,230	3,800	1,900	1,300		1,300	10,800		a22,000	a22,000	
13	7,770	3,910	3,700	1,800	1,300		1,300	10,400			21,900	
14	6,840	3,720	3,500	1,800	1,300		1,400	12,000			21,200	
15	6,610	3,740	3,400	1,800	1,300		1,400	11,200			a21,000	
16	6,740	3,740	*3,260	1,800	1,300		1,400	11,000			a20,000	
17	6,900	3,930	3,110	1,800	1,300		1,500	10,500			a19,000	
18	7,220	3,820	3,000	1,900	1,200		1,500	a10,000			a18,000	
19	7,540	3,680	a2,900	1,900	1,200		1,500	a12,000			a18,000	
20	7,610	3,520	a2,700	2,000	1,200		1,500	13,800	*19,000		a18,000	
21	7,990	3,280	2,600	2,000	1,200		1,400	a17,000			a18,000	
22	8,380	3,090	2,500	1,900	1,200		1,400	a23,000			a17,000	
23	9,000	2,900	2,400	1,800	1,200		1,400	a25,000			a16,000	a6,600
24	8,600	2,900	2,300	1,700	1,200	1,100	a1,500	a23,000			a15,000	
25	7,400	2,900	2,300	1,700	1,200		a1,700	a23,000		21,000	a14,000	
26	6,600	3,000	2,200	1,600	1,200		a1,900	a22,000	a22,000	a19,000	a13,000	
27	6,200	3,200	2,200	1,600	1,200		a2,100	a19,000		a21,000	a13,000	
28	6,000	3,400	2,200	1,500	1,200		2,360	a17,000		a24,000	*12,400	
29	6,200	3,600	2,200	*1,500	-		2,620	a17,000		a32,000	12,000	
30	5,800	3,800	2,200	1,500	-------		3,020	*20,400		*31,800	a11,000	
31	5,400	-------	2,300	1,500	-------		-------	a25,000	-------	32,400	a11,000	-------
Total	254,570	118,610	101,170	60,900	36,600	35,600	46,000	399,770	771,000	709,200	698,800	226,500
Mean	8,212	3,954	3,264	1,965	1,307	1,148	1,533	12,900	25,700	22,880	22,540	7,550
Ac-ft	504,900	235,300	200,700	120,800	72,600	70,610	91,240	792,900	‡1,529	‡1,407	‡1,386	449,300

Calendar year 1957: Max 40,600 Min - Mean 10,760 Ac-ft 7,789,000
Water year 1957-58: Max 47,800 Min - Mean 9,476 Ac-ft 6,860,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record; discharge estimated on basis of 4 discharge measurements, weather records, and records for station near Denali, Matanuska River at Palmer, Nenana River near Healy, and Chulitna River near Talkeetna.

Note.--Stage-discharge relation affected by ice Oct. 1 to May 10 (no gage-height record Oct. 4-6, Oct. 24 to Nov. 7, Nov. 23 to Dec. 15, Jan. 18-28, Mar. 1 to Apr. 1; discharge estimated on basis of 5 discharge measurements, weather records, and records for station near Denali, Matanuska River at Palmer, and Nenana River near Healy).

2924. Chulitna River near Talkeetna

Location.--Lat 62°29', long 150°15', on right bank 1½ miles downstream from small tributary, 11 miles upstream from mouth, and 12 miles northwest of Talkeetna.

Drainage area.--2,570 sq mi, approximately.

Records available.--February to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 500 ft (from topographic map).

Extremes.--Maximum discharge during period February to September 1958, 35,100 cfs Aug. 3 (gage height, 14.08 ft), from rating curve extended above 26,000 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Large diurnal fluctuation caused by glacier melt at the source.

Discharge, in cubic feet per second, February to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								3,000	21,800	20,600	29,500	
2								3,300	25,000	21,900	32,300	
3							(*)	3,800	26,000	24,600	33,800	
4								4,300	27,000	27,000	28,900	
5								4,800	27,000	29,000	26,200	
6								*5,320	28,000	29,500	26,100	
7								5,260	28,000	29,400	26,700	
8					1,100	1,000	940	5,680	29,000	28,600	26,500	9,200
9									26,000	25,600	25,000	
10									24,000	23,100	24,000	
11									22,000	23,100	23,000	
12						(*)			20,000	20,700	22,000	
13									19,000	19,000	22,000	
14									18,000	20,900	21,000	
15								9,400	18,000	20,900	21,000	
16									18,000	19,500	20,000	
17									18,000	23,000	19,000	
18									19,000	26,200	18,000	
19									*20,400	25,900	18,000	
20									22,000	23,900	18,000	
21									24,600	23,900	18,000	
22					980				25,400	24,700	17,000	
23									24,200	*26,800	16,000	6,800
24						900	1,500		23,300	27,100	16,000	
25									23,200	25,600	15,000	
26								16,000	24,700	21,200	15,000	
27									25,000	22,900	14,000	
28									24,100	29,700	14,000	
29					-				22,900	31,700	13,000	
30				†1,150	-------				21,500	30,800	*12,500	
31		-------			-------		-------		-------	28,600	12,000	-------
Total					29,240	29,400	36,600	324,260	695,100	775,400	643,500	240,000
Mean					1,044	948	1,220	10,460	23,170	25,010	20,760	8,000
Ac-ft					58,000	58,310	72,600	643,200	‡1,379	‡1,538	‡1,276	476,000

Calendar year : Max - Min - Mean - Ac-ft -
Water year : Max - Min - Mean - Ac-ft -

Peak discharge (base, 30,000 cfs).--June 8 or 9 (time unknown) about 30,000 cfs; July 25 (2:30 a.m.) 30,000 cfs (12.88 ft); July 29 (9 a.m.) 33,100 cfs (13.54 ft); Aug. 3 (2:30 a.m.) 35,100 cfs (14.08 ft).

* Discharge measurement made on this day.
† Result of discharge measurement.
‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Mar. 11-13, Apr. 3-12. No gage-height record Feb. 1 to Mar. 10, Mar. 14 to Apr. 2, Apr. 13 to May 5 (stage-discharge relation affected by ice during most of periods), May 9-31, June 2-18, Aug. 9-29, Aug. 31 to Sept. 30; discharge estimated on basis of 6 discharge measurements, weather records, and records for Susitna River at Gold Creek, Nenana River near Healy, and Matanuska River at Palmer.

2960. Uganik River near Kodiak

Location.--Lat 57°41'05", long 153°25'10", on Kodiak Island, on right bank half a mile upstream from tidewater of East Arm Uganik Bay, 1 mile downstream from Mush Lake tributary, 4 miles downstream from Uganik Lake, and 40 miles west of Kodiak.

Drainage area.--123 sq mi.

Records available.--May 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map).

Average discharge.--7 years, 618 cfs (447,400 acre-ft per year).

Extremes.--Maximum discharge during year, 5,920 cfs June 21 (gage height, 8.80 ft), from rating curve extended above 2,500 cfs by logarithmic plotting; minimum daily, 130 cfs Jan. 1-4.
1951-58: Maximum discharge, 13,700 cfs Oct. 3, 1952 (gage height, 10.65 ft), from rating curve extended above 2,500 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those above 2,500 cfs and those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	438	1,120	560	130	330	335	279	764	1,140	1,570	690	404
2	392	1,200	528	130	310	350	279	920	1,250	1,600	654	392
3	356	1,430	466	130	290	356	275	952	1,350	1,600	628	392
4	325	1,100	431	130	270	330	275	870	1,740	2,100	*663	374
5	305	792	404	140	250	305	275	860	3,310	2,290	802	335
6	305	672	362	140	230	292	283	840	4,180	2,500	1,020	310
7	287	1,040	330	150	220	271	292	744	4,470	*2,030	890	296
8	275	1,980	300	160	210	247	292	645	3,280	1,660	792	283
9	251	1,350	335	180	200	233	296	544	2,080	1,350	699	271
10	240	952	404	190	200	219	362	466	1,870	1,320	726	266
11	233	952	392	210	210	219	*512	438	2,080	1,140	726	325
12	226	1,320	356	230	230	226	544	417	2,160	1,250	870	368
13	212	1,080	330	240	250	229	496	410	1,680	1,490	941	335
14	212	782	300	240	280	236	445	438	1,370	1,220	1,210	305
15	229	628	271	240	300	240	410	445	1,170	952	1,220	*292
16	325	1,030	236	230	310	240	380	452	1,100	1,090	920	279
17	368	1,210	220	230	310	240	350	473	1,170	1,500	820	266
18	930	1,050	200	230	*300	236	330	466	1,340	1,420	820	251
19	930	2,000	190	350	292	233	315	459	2,660	1,170	773	244
20	1,540	2,170	180	530	287	226	305	473	4,600	1,050	699	229
21	1,690	1,620	180	628	279	219	287	536	5,470	1,060	963	219
22	2,450	*1,100	170	625	262	209	279	681	3,960	1,140	1,250	212
23	2,140	830	170	611	275	206	279	1,370	2,620	1,350	1,280	240
24	1,540	764	160	586	445	200	296	1,640	1,810	1,040	1,350	251
25	920	754	160	552	552	196	300	1,720	1,490	840	1,010	240
26	672	1,040	150	512	480	187	320	*1,400	1,460	1,050	820	226
27	668	920	150	466	417	184	345	1,280	1,420	1,200	699	219
28	1,810	782	140	438	368	203	380	1,150	1,490	963	602	209
29	1,970	663	140	410	-	209	410	1,080	1,460	754	520	352
30	1,320	568	140	374	------	229	504	1,020	1,300	681	452	974
31	952	------	140	350	------	262	------	1,050	------	690	424	------
Total	24,511	32,899	8,495	9,765	8,357	7,567	10,395	25,003	66,480	41,070	25,933	9,359
Mean	791	1,097	274	315	298	244	346	807	2,216	1,325	837	312
Cfsm	6.43	8.92	2.23	2.56	2.42	1.98	2.81	6.56	18.02	10.77	6.80	2.54
In.	7.41	9.95	2.57	2.95	2.53	2.29	3.14	7.56	20.10	12.42	7.84	2.83
Ac-ft	48,620	65,250	16,850	19,370	16,580	15,010	20,620	49,590	131,900	81,460	51,440	18,560

Calendar year 1957: Max 4,680 Min - Mean 669 Cfsm 5.44 In. 73.85 Ac-ft 484,500
Water year 1957-58: Max 5,470 Min 130 Mean 739 Cfsm 6.01 In. 81.59 Ac-ft 535,200

Peak discharge (base, 3,400 cfs).--June 7 (3 a.m.) 4,630 cfs (8.34 ft); June 21 (6:30 a.m.) 5,920 cfs (8.80 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 17 to Jan. 10, Jan. 31 to Feb. 3. No gage-height record Jan. 11-20, Feb. 4-17; discharge estimated on basis of 1 discharge measurement, recorded range in stage, and weather records.

3000. Newhalen River near Iliamna

Location.--Lat 59°52', long 154°42', on left bank 1 mile upstream from rapids, 1 mile downstream from old portage dock, 8 miles downstream from Fish Village, 8 miles downstream from outlet of Sixmile Lake, and 8 miles north of Iliamna.

Drainage area.--3,300 sq mi, approximately.

Records available.--July 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map).

Average discharge.--7 years, 9,092 cfs (6,582,000 acre-ft per year).

Extremes.--Maximum discharge during year, 25,200 cfs June 24 (gage height, 7.07 ft); minimum not determined.
1951-58: Maximum discharge, 29,600 cfs July 1, 1953 (gage height, 8.03 ft); minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17,300	13,700	8,770					2,800	9,240	23,700	20,900	18,900
2	16,700	13,400	8,630					2,900	9,940	23,500	20,900	18,600
3	16,200	13,200	8,410					3,000	10,900	23,200	21,000	18,200
4	15,500	13,000	8,340					3,100	11,800	23,300	*20,800	17,700
5	14,800	12,800	8,270				2,300	3,300	12,700	23,600	20,700	17,100
6	14,300	12,700	8,090					3,500	13,800	24,200	20,700	16,700
7	13,900	12,400	7,940					3,700	14,900	*24,500	20,600	16,300
8	13,300	12,300	7,660	4,800	3,300	2,500		3,900	16,200	24,700	20,400	15,700
9	12,900	12,000	7,460					4,100	17,600	24,600	20,500	15,200
10	12,500	11,700	7,360				*2,290	4,400	18,400	24,200	20,300	14,800
11	12,200	11,600	7,290					4,700	19,000	23,900	20,200	14,600
12	11,800	11,300	b7,200					5,000	19,400	23,500	20,700	14,300
13	11,300	11,100	b7,000					5,600	19,500	23,100	21,700	13,900
14	11,000	10,800	b6,800	(*)				6,100	19,600	22,800	22,800	13,500
15	10,700	10,600	b6,500					6,500	19,500	22,600	23,500	*13,200
16	10,400	10,400	b6,300					6,920	19,300	22,400	23,800	12,900
17	10,200	10,000	b6,100					7,120	19,100	22,000	23,800	12,700
18	10,100	9,830	b6,000					7,260	18,700	21,600	23,400	12,400
19	9,490	9,640	b5,900					7,290	18,600	21,500	22,900	12,300
20	9,280	9,750	5,700				2,200	7,360	18,900	21,400	22,500	12,100
21	9,310	*10,100	5,600					7,360	20,100	21,100	22,100	11,800
22	9,940	9,980	5,400		2,800			7,320	22,700	20,800	21,900	11,600
23	11,200	9,870	5,200	4,400		2,300		7,360	24,400	20,900	22,300	11,500
24	12,700	9,710	5,000					7,360	25,100	21,100	22,300	11,200
25	13,600	9,420	4,800					7,600	25,100	20,900	22,300	11,100
26	13,800	9,460	4,700					*7,770	24,900	20,900	22,000	11,100
27	13,900	9,350	4,500					8,050	24,600	20,700	21,600	11,000
28	13,900	9,310	4,400					8,160	24,400	20,600	21,000	10,900
29	13,800	8,990	4,400		-			8,340	24,100	20,700	20,500	10,800
30	13,800	8,660	4,400		------			8,630	23,900	20,800	19,900	10,600
31	13,800	------	4,500		------		------	8,880	--------	21,000	19,300	------
Total	393,620	327,070	198,620	142,400	85,900	74,300	66,990	185,380	566,380	693,800	667,300	412,700
Mean	12,700	10,900	6,407	4,594	3,068	2,397	2,233	5,980	18,880	22,380	21,530	13,760
Ac-ft	780,700	648,700	394,000	282,400	170,400	147,400	132,900	367,700	‡1,123	‡1,376	‡1,324	818,600

Calendar year 1957: Max 25,100 Min - Mean 9,523 Ac-ft 6,895,000
Water year 1957-58: Max 25,100 Min - Mean 10,450 Ac-ft 7,566,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Dec. 20 to Apr. 9 (stage-discharge relation affected by ice during most of period), Apr. 11 to May 15; discharge estimated on basis of 2 discharge measurements and weather records.

3020. Nuyakuk River near Dillingham

Location.--Lat 59°56', long 158°12', on left bank 1,000 ft downstream from outlet of Tikchik Lake, half a mile upstream from unnamed tributary, and 62 miles north of Dillingham.

Drainage area.--1,490 sq mi, approximately.

Records available.--May 1953 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 350 ft (from topographic map). Prior to Oct. 1, 1957, at datum 2.00 ft higher.

Average discharge.--5 years, 5,870 cfs (4,250,000 acre-ft per year).

Extremes.--Maximum discharge during year, 29,000 cfs June 25 (gage height, 9.65 ft); minimum not determined.
1953-58: Maximum discharge, that of June 25, 1958; minimum not determined.

Remarks.--Records good except those for period of ice effect, which are fair, and those for period of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10,300	8,030	7,230					2,500	7,450	26,100	14,500	9,250
2	9,850	8,330	7,260					2,600	7,870	25,500	14,100	9,070
3	9,330	8,680	7,080					2,700	8,330	24,800	13,600	8,890
4	8,780	8,820	7,080			(*)		2,800	8,610	24,100	13,200	8,680
5	8,640	8,780	6,810					2,800	9,850	23,800	*13,100	8,330
6	8,640	9,070	6,580					2,800	11,400	23,900	12,800	8,030
7	8,470	9,180	6,410					2,800	12,800	*24,200	12,200	7,830
8	8,130	9,660	6,160	3,200	2,400		2,100	2,800	14,300	24,800	11,600	7,510
9	7,900	9,770	6,140				(*)	2,900	15,500	25,100	11,400	7,170
10	7,640	9,850	6,000					2,900	16,400	25,100	10,900	7,080
11	7,580	9,880	5,900					3,000	17,300	24,700	10,700	7,080
12	7,140	9,740	5,740					3,100	18,800	24,400	10,900	7,080
13	6,810	9,510	b5,500					3,200	20,000	24,600	11,300	7,050
14	6,640	9,360	b5,200					3,300	20,800	24,800	11,400	7,050
15	6,410	9,250	b4,900	(*)		2,100		3,400	21,400	24,500	11,400	7,080
16	6,410	9,110	b4,700					3,500	21,600	24,100	11,400	*7,020
17	6,360	9,040	b4,400					3,500	21,600	23,400	11,400	6,870
18	6,360	8,960	b4,200					3,600	21,200	22,700	11,400	6,780
19	6,190	8,960	b4,000					3,600	21,900	22,400	11,300	6,720
20	6,030	9,070	b3,800					3,700	23,600	21,300	11,100	6,700
21	6,190	*9,180	3,600					3,800	25,400	20,600	10,800	6,440
22	6,720	8,960	3,500		2,300			3,900	27,100	19,700	10,900	6,380
23	7,050	8,820	3,400	3,000			2,000	4,100	28,300	19,300	11,100	6,440
24	7,320	8,720	3,300					4,300	28,800	18,500	11,000	6,300
25	7,200	8,200	3,300					4,600	28,900	17,800	10,900	6,160
26	7,170	8,330	3,300					5,160	28,600	17,100	10,700	6,110
27	7,170	8,130	3,200					*5,740	28,100	16,900	10,500	6,030
28	7,290	7,960	3,200					6,220	27,500	16,400	10,300	5,870
29	7,390	7,800	3,200		-			6,500	27,000	16,000	10,100	5,800
30	7,700	7,420	3,200		------			6,640	26,500	15,600	9,810	6,140
31	7,700	------	3,200		------		------	7,020	------	15,200	9,590	------
Total	232,510	266,570	151,490	96,000	65,900	65,100	61,500	119,480	596,910	677,400	355,400	212,940
Mean	7,500	8,886	4,887	3,097	2,354	2,100	2,050	3,854	19,900	21,850	11,460	7,098
Ac-ft	461,200	528,700	300,500	190,400	130,700	129,100	122,000	237,000	‡1,184	‡1,344	704,900	422,400

Calendar year 1957: Max 15,800 Min - Mean 5,675 Ac-ft 4,109,000
Water year 1957-58: Max 28,900 Min - Mean 7,948 Ac-ft 5,755,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Dec. 21 to May 25 (stage-discharge relation affected by ice during part of period); discharge estimated on basis of 3 discharge measurements and weather records.

3030. Wood River at Aleknagik

Location.--Lat 59°17', long 158°35', on left bank at outlet of Lake Aleknagik, 1 mile east of Aleknagik and 5 miles upstream from Arcana Creek.

Drainage area.--1,110 sq mi, approximately.

Records available.--September 1957 to September 1958.

Gage.--Staff gage read once daily. Altitude of gage is 20 ft (by barometer).

Extremes.--1957-58: Maximum discharge during water year, 16,000 cfs June 25 (gage height, 12.68 ft); minimum daily, 1,400 cfs Apr. 6-10, 15, 16.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, 1957

Sept.24	*8,210	Sept.28	7,890
25	8,020	29	7,870
26	7,990	30	7,680
27	7,910		

* Discharge measurement made on this day

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,340	7,490	7,830	3,100	2,400	1,910	1,500	2,920	9,080	14,800	8,180	6,430
2	7,110	7,680	7,440	3,100	2,360	2,050	1,500	3,100	9,260	14,600	7,950	6,390
3	6,920	7,760	7,150	3,200	2,290	*1,990	1,500	3,320	9,430	14,200	7,760	6,240
4	6,620	7,990	7,150	3,300	2,250	2,010	1,500	3,490	9,680	14,100	7,610	6,060
5	6,810	7,800	7,110	3,400	2,190	2,000	1,500	3,690	10,500	13,800	*7,440	5,860
6	6,770	8,020	6,770	3,400	2,050	1,900	1,400	3,880	12,100	13,800	7,340	5,620
7	6,730	8,060	6,580	3,300	2,010	1,900	1,400	3,930	12,800	14,100	7,260	5,490
8	6,540	8,200	6,390	3,100	1,990	1,800	1,400	4,060	13,200	*14,700	7,420	5,420
9	6,390	8,380	6,200	3,000	1,900	1,800	*1,400	4,120	13,500	15,200	6,920	5,350
10	6,200	8,480	6,000	2,900	1,900	1,800	1,400	4,040	13,500	15,200	6,580	5,450
11	6,130	8,480	5,800	2,800	1,900	1,800	1,500	4,060	13,800	15,000	6,730	5,500
12	5,860	8,440	5,500	2,800	2,000	1,800	1,500	4,120	14,000	15,100	7,070	5,520
13	5,720	8,400	5,300	2,700	2,000	1,900	1,500	4,060	14,200	15,200	7,170	5,520
14	5,590	8,330	5,000	2,600	2,100	1,900	1,500	4,270	14,500	15,200	7,230	5,520
15	5,620	8,250	4,700	2,600	2,100	1,800	1,400	4,510	14,400	15,200	7,190	5,550
16	5,790	8,270	4,400	2,600	2,100	1,800	1,400	4,720	14,100	14,900	7,240	*5,600
17	5,790	8,290	4,200	2,600	2,100	1,700	1,500	4,810	14,100	14,600	7,360	5,780
18	5,790	8,480	4,000	2,600	2,000	1,700	1,500	4,910	13,800	14,100	7,090	5,860
19	5,690	8,400	3,800	2,600	2,000	1,700	1,500	5,010	13,800	13,700	7,060	5,860
20	5,550	8,480	3,600	2,600	2,000	1,700	1,500	5,110	14,100	13,300	7,000	5,690
21	5,620	8,420	3,400	2,700	1,900	1,700	1,600	5,040	14,600	12,700	7,000	5,660
22	5,890	*8,370	3,300	2,700	1,900	1,800	1,600	5,250	15,100	12,100	7,240	5,780
23	5,890	8,330	3,200	2,800	1,900	1,760	1,700	5,740	15,700	11,800	7,240	5,960
24	6,300	8,290	3,200	2,900	2,000	1,710	1,800	6,390	15,900	11,300	7,590	6,000
25	6,240	8,250	3,100	2,910	2,000	1,690	1,900	6,770	16,000	10,700	7,260	5,890
26	6,200	8,580	3,100	2,820	2,000	1,600	2,000	7,450	15,800	10,200	7,490	5,790
27	6,260	8,440	3,000	2,690	1,970	1,600	2,200	*8,020	15,300	9,680	7,130	5,660
28	6,770	8,250	3,000	2,600	2,010	1,500	2,300	8,290	15,200	9,470	6,980	5,350
29	6,960	8,140	3,000	2,640	-	1,500	2,500	8,480	15,100	9,200	6,800	5,180
30	7,150	8,000	3,000	2,580	------	1,500	2,800	8,730	14,800	8,960	6,540	5,350
31	7,110	------	3,000	2,490	------	1,500	------	8,960	------	8,560	6,480	------
Total	195,350	246,750	149,220	88,130	57,320	54,820	49,700	161,180	407,380	405,470	223,130	171,330
Mean	6,302	8,225	4,814	2,843	2,047	1,768	1,657	5,199	13,580	13,080	7,198	5,711
Cfsm	5.68	7.41	4.34	2.56	1.84	1.59	1.49	4.68	12.2	11.8	6.48	5.15
In.	6.55	8.27	5.00	2.95	1.92	1.84	1.67	5.40	13.65	13.59	7.48	5.74
Ac-ft	387,500	489,400	296,000	174,800	113,700	108,700	98,580	319,700	808,000	804,200	442,600	339,800

Calendar year 1957: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1957-58: Max 16,000 Min 1,400 Mean 6,054 Cfsm 5.45 In. 74.06 Ac-ft 4,383,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 9 to Jan. 24, Feb. 9-26 (no gage-height record Feb. 17-24), Mar. 5-21, Mar. 26 to Apr. 30.

3040. Kuskokwim River at Crooked Creek

Location.--Lat 61°52', long 158°07', on right bank at Parent's Trading Post, 0.2 mile upstream from Crooked Creek and 0.7 mile upstream from village of Crooked Creek.

Drainage area.--31,100 sq mi, approximately.

Records available.--Discharge: June 1951 to September 1958.
Chemical analyses: May 1957 to August 1958.
Water temperatures: May to October 1957, May to August 1958.

Gage.--Staff gage read twice daily. Altitude of gage is 200 ft (from topographic map).

Average discharge.--7 years, 41,840 cfs (30,290,000 acre-ft per year).

Extremes.--Maximum discharge during year, 115,000 cfs Aug. 18, 19; maximum gage height, 9.45 ft Aug. 18; minimum discharge not determined.
1951-58: Maximum discharge not determined; maximum daily discharge, 260,000 cfs May 7, 1957; maximum gage height, 25.4 ft May 1, 1953 (ice jam), from floodmarks; minimum discharge not determined.
1957-58: Maximum water temperature, 64°F July 21.
1956-58: Maximum water temperature, 66°F Aug. 3, 1957.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Records of specific conductance of daily samples available in district office, Quality of Water Branch, Palmer, Alaska.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37,200							15,000	55,400	51,100	74,500	70,200
2	35,600							16,000	54,800	52,600	73,200	70,200
3	34,000							18,000	55,000	54,400	73,400	69,200
4	33,500							20,000	55,300	54,100	73,800	68,500
5	a32,000					(*)		23,000	55,800	53,800	*74,000	a67,000
6	31,600							26,000	57,200	53,500	75,500	66,600
7	31,200							29,000	60,000	53,400	77,300	63,500
8	31,100	37,000	25,000	17,000	14,000			31,000	64,400	*53,300	a80,000	a60,000
9	31,100						(*)	b32,000	70,800	53,100	a82,000	57,600
10	30,800						11,000	b33,000	73,300	53,800	83,600	56,200
11	30,400							b33,000	73,800	54,500	84,900	56,600
12	29,800							b33,000	72,100	58,300	a86,000	58,300
13	b28,000							b33,000	72,700	66,200	a90,000	61,100
14	a27,000							b33,000	67,200	65,600	92,300	65,800
15	25,300					11,000		b35,000	66,500	66,400	101,000	65,500
16	24,900							b38,000	60,500	a70,000	106,000	*63,400
17	25,900			(*)				b41,000	60,100	70,900	113,000	61,500
18	25,800							b43,000	59,300	67,400	115,000	59,000
19	25,000							44,700	56,900	66,700	115,000	58,600
20	a25,000							46,000	53,200	65,500	113,000	55,600
21	25,900							46,100	a52,000	65,200	107,000	55,900
22	26,500				13,000			45,800	52,500	64,000	99,100	56,200
23	b28,000	32,000						45,300	54,500	63,000	94,400	58,700
24	b30,000		17,000	16,000				45,300	55,500	64,000	87,700	61,800
25	b31,000						13,000	47,300	55,500	65,400	86,100	70,800
26	b31,000							48,900	55,800	68,400	83,500	72,600
27	30,000							*50,800	54,700	70,300	82,000	72,800
28	29,000							52,400	53,400	71,300	a80,000	a72,000
29	29,000				-			54,300	51,200	74,100	76,500	a70,000
30	30,000				-------			55,200	50,300	76,900	73,800	69,000
31	31,000	-------			-------		-------	55,600	-------	78,200	72,100	-------
Total	916,600	#1,035	647,000	511,000	379,000	341,000	350,000	#1,169.5	#1,779.7	#1,943.4	#2,725.7	#1,912.2
Mean	29,570	34,500	20,870	16,480	13,540	11,000	11,670	37,730	59,320	62,690	87,930	63,740
Ac-ft	#1,818	#2,053	#1,283	#1,014	751,700	676,400	694,200	#2,320	#3,530	#3,855	#5,406	#3,793

Calendar year 1957: Max 260,000 Min - Mean 42,790 Ac-ft 30,980,000
Water year 1957-58: Max 115,000 Min - Mean 37,560 Ac-ft 27,190,000

* Discharge measurement made on this day.
# Expressed in thousands.
a No gage-height record; discharge interpolated.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Oct. 27 to May 8 (stage-discharge relation affected by ice during entire period); discharge estimated on basis of 3 discharge measurements, weather records, and records for Nuyakuk River near Dillingham.

3040. KUSKOKWIM RIVER AT CROOKED CREEK--Continued

Chemical analyses, in parts per million, October 1957 to August 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1, 3-10, 1957....	32,500	11	0.08	31	6.6	2.7	1.5	110	18	0.5	0.2	3.0	a129	104	14	218	7.2	25
Oct. 11-20	26,700	11	.13	32	7.5	3.0	1.3	118	17	1.5	.2	1.4	a135	111	14	225	7.4	25
Oct. 21-26	28,700	10	.16	29	6.4	2.4	1.4	108	15	.5	.2	1.2	a131	99	10	204	7.5	45
Jan. 17, 1958	17,000	12	.02	41	9.4	2.9	1.7	157	18	1.0	.2	.8	164	140	12	274	7.4	7
Apr. 8.....	11,000	9.4	.02	28	8.9	2.6	1.2	120	15	2.5	.0	.3	127	106	8	216	7.0	0
May 10-20.....	37,500	9.4	.23	21	5.6	2.0	.8	75	15	.6	.2	1.5	93	76	14	155	7.1	25
May 21-31	49,700	8.9	.17	20	5.1	1.9	1.0	76	11	.9	.2	2.1	88	71	9	149	7.2	20
June 1-7	56,200	7.8	.09	20	5.0	2.1	1.2	73	10	.5	.3	3.3	86	70	10	152	6.7	20
June 8-14	70,600	8.2	.10	25	5.5	2.1	1.7	83	16	1.0	.2	3.5	104	85	17	181	--	20
June 15-23	57,300	8.6	.13	26	6.3	2.3	1.4	94	18	.5	.2	.9	110	91	14	190	7.2	20
June 24-30	53,800	9.7	.11	26	7.7	2.4	1.1	96	20	.5	.2	.4	115	96	18	196	7.2	10
July 1-5	53,200	11	.14	27	6.6	2.4	1.1	96	20	.5	.2	.6	116	94	16	195	7.2	10
July 7-20	61,800	9.1	.17	27	6.2	2.2	1.1	94	19	.5	.2	.6	112	93	16	189	7.2	25
July 21-31	69,000	12	.18	25	6.9	1.8	1.3	91	19	1.0	.0	1.3	113	91	16	185	7.1	20
Aug. 1-6.....	74,100	11	.22	26	6.3	1.6	1.2	94	20	1.0	.0	1.0	114	91	14	191	7.1	25

a Residue ou evaporation at 180°C.

3040. KUSKOKWIM RIVER AT CROOKED CREEK--Continued

Temperature (°F) of water, water year October 1957 to August 1958
/Once-daily measurement at approximately 9 a.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42							--	58	56	58	
2	--							--	57	60	60	
3	36							--	59	66	58	
4	37							--	58	62	56	
5	39							--	54	60	54	
6	39							--	60	60	60	
7	37							--	54	56	--	
8	37							--	59	56	--	
9	39							--	56	59	--	
10	36							40	60	60	--	
11	35							42	55	60	--	
12	33							46	53	57	--	
13	32							46	57	57	--	
14	33							44	55	52	--	
15	35							44	55	50	--	
16	37							44	55	55	--	
17	37							44	55	51	--	
18	34							42	56	--	--	
19	35							48	56	52	--	
20	37							46	60	57	--	
21	37							42	58	64	--	
22	38							47	56	60	--	
23	37							47	56	64	--	
24	37							47	56	54	--	
25	34							47	59	56	--	
26	35							48	--	58	--	
27	--							50	58	58	--	
28	--							48	59	58	--	
29	--							50	56	60	--	
30	--							52	57	60	--	
31	--							53	--	62	--	
Average	--							--	57	58	--	

3560. Yukon River at Eagle

Location.--Lat 64°47'30", long 141°12'00", on left bank at Eagle, an eighth of a mile upstream from Mission Creek, 1.1 miles downstream from Castalia Creek, and 11 miles downstream from international boundary.

Drainage area.--113,500 sq mi, approximately.

Records available.--Discharge: January 1911 to December 1913, June 1950 to September 1958. Monthly discharge only for some periods, published in WSP 1372.
Chemical analyses: April to October 1951, June to September 1952.
Water temperatures: May to October 1951, June to August 1952.
Sediment records: July and October 1954, April and August 1955 (periodic).

Gage.--Water-stage recorder. Altitude of gage is 750 ft (from topographic map). January 1911 to December 1913 staff gage at site half a mile downstream at different datum. June 22, 1950, to Sept. 30, 1955, staff gage at site 1.1 miles upstream at datum 10 ft higher. Oct. 1, 1955, to Aug. 10, 1957, staff gage at present site at datum 10 ft higher.

Average discharge.--10 years, 69,970 cfs (50,660,000 acre-ft per year).

Extremes.--Maximum discharge during year, 202,000 cfs June 12 (gage height, 19.08 ft); minimum not determined.
1911-13, 1950-58: Maximum discharge, 561,000 cfs May 30, 1957 (gage height, 23.01 ft), from rating curve extended above 230,000 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those below 60,000 cfs, which are fair, and those for periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--WSP 1372: 1911-14, drainage area.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a90,000	31,100						21,000	154,000	135,000	a120,000	
2	a87,000	31,100						22,000	152,000	132,000	a120,000	
3	a82,000	31,400						23,000	153,000	131,000	a130,000	
4	a82,000	31,000		(*)				25,000	156,000	131,000	133,000	
5	a78,000	31,100						26,000	158,000	133,000	128,000	a96,000
6	*74,500	a31,000						28,000	166,000	134,000	123,000	
7	72,700	a31,000						30,000	173,000	137,000	119,000	
8	69,800	a30,000	18,000	19,000	17,000	12,000	12,000	31,000	175,000	140,000	116,000	
9	67,300	a30,000						33,000	185,000	138,000	114,000	
10	65,900	a29,000						36,000	197,000	134,000	112,000	
11	64,300	a28,000					(*)	39,000	201,000	132,000	112,000	
12	63,500	a29,000						43,000	201,000	132,000	112,000	
13	62,600	a30,000						47,000	196,000	136,000	110,000	
14	62,400	a31,000						52,000	192,000	131,000	108,000	
15	61,100	a33,000						57,000	191,000	119,000	106,000	a83,000
16	60,300	33,000			(*)			63,000	178,000	115,000	105,000	
17	60,300	31,000						71,000	161,000	117,000	103,000	
18	60,600	30,000						78,000	*153,000	120,000	113,000	
19	60,800	29,000						88,800	150,000	121,000	118,000	
20	60,800	28,000						98,000	147,000	125,000	115,000	
21	59,600	25,000						106,000	140,000	125,000	114,000	
22	57,600	22,000			15,000			119,000	139,000	120,000	113,000	
23	55,400	20,000						128,000	142,000	118,000	111,000	
24	49,700	18,000	14,000	15,000		11,000	16,000	143,000	145,000	118,000	110,000	
25	48,200	18,000						181,000	148,000	116,000	114,000	a70,000
26	43,800	17,000						178,000	144,000	114,000	116,000	
27	40,300	17,000						184,000	138,000	*111,000	115,000	
28	32,800	16,000						188,000	140,000	107,000	109,000	
29	30,900	16,000			-			180,000	144,000	104,000	a110,000	
30	32,800	16,000			-------			166,000	140,000	105,000	a100,000	
31	32,700	-------			-------		-------	157,000	-------	a110,000	*102,000	-------
Total	‡1,869.7	793,700	494,000	525,000	450,000	356,000	420,000	‡2,641.8	‡4,859	‡3,841	‡3,531	‡2,490
Mean	60,310	26,460	15,940	16,940	16,070	11,480	14,000	85,220	162,000	123,900	113,900	83,000
Ac-ft	‡3,708	‡1,574	979,800	‡1,041	892,600	706,100	833,100	‡5,240	‡9,638	‡7,619	‡7,004	‡4,939

Calendar year 1957: Max 553,000 Min - Mean 87,380 Ac-ft 63,260,000
Water year 1957-58: Max 201,000 Min - Mean 61,020 Ac-ft 44,170,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
a No gage-height record; discharge estimated on basis of 3 discharge measurements, weather records, and records for station at Rampart.
Note.--Stage-discharge relation affected by ice Nov. 16 to May 18 (no gage-height record Dec. 2 to May 7; discharge estimated on basis of 3 discharge measurements and weather records).

4680. Yukon River at Rampart

Location.--Lat 65°31', long 150°11', on left bank at Rampart, half a mile downstream from Squaw Creek, 1¼ miles downstream from Minook Creek, and 3¼ miles upstream from Russian Creek.

Drainage area.--199,400 sq mi, approximately.

Records available.--Discharge: June 1955 to September 1958.
Chemical analyses: June to September 1954, June to October 1955, June to September 1956.
Water temperatures: June to August 1954, June, August, September 1955, May to September 1956.

Gage.--Staff gage read twice daily. Altitude of gage is 300 ft (from topographic map).

Extremes.--Maximum discharge during year, 436,000 cfs June 2 (gage height, 35.00 ft, from graph based on gage readings), from rating curve extended above 350,000 cfs by logarithmic plotting; minimum not determined.
1955-58: Maximum discharge, 686,000 cfs June 2, 1957 (gage height, 46.40 ft, from graph based on gage readings), from rating curve extended above 350,000 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for period of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	149,000								435,000	190,000	168,000	149,000
2	139,000								435,000	185,000	161,000	146,000
3	123,000			(*)					424,000	185,000	166,000	150,000
4	120,000								401,000	185,000	174,000	149,000
5	120,000								379,000	177,000	181,000	145,000
6	112,000								358,000	172,000	188,000	143,000
7	105,000								346,000	169,000	198,000	142,000
8	105,000	40,000	21,000	22,000	21,000	15,000	13,000	39,000	330,000	166,000	209,000	141,000
9	104,000								315,000	164,000	211,000	139,000
10	*103,000						(*)		301,000	165,000	203,000	137,000
11	101,000								290,000	171,000	192,000	129,000
12	99,600								285,000	176,000	181,000	121,000
13	96,900								281,000	176,000	174,000	118,000
14	93,000								278,000	175,000	167,000	116,000
15	89,800				(*)				274,000	171,000	162,000	114,000
16	87,000								266,000	170,000	159,000	113,000
17	85,000								258,000	169,000	154,000	111,000
18	83,000								*254,000	165,000	148,000	110,000
19	82,000								253,000	161,000	144,000	108,000
20	82,000								247,000	153,000	142,000	106,000
-								180,000				
21	82,000								239,000	149,000	139,000	104,000
22	82,000								231,000	148,000	141,000	103,000
23	81,000	32,000	16,000	19,000	19,000	13,000	18,000		223,000	150,000	145,000	99,900
24	79,000								213,000	155,000	147,000	98,000
25	75,000								205,000	156,000	146,000	95,800
26	70,000							350,000	196,000	*157,000	144,000	94,900
27	64,000							365,000	192,000	158,000	144,000	93,700
28	60,000							382,000	194,000	162,000	142,000	92,600
29	56,000				-			405,000	200,000	169,000	*142,000	91,700
30	50,000				-------			416,000	198,000	170,000	144,000	91,000
31	43,000	-------			-------		-------	429,000	-------	163,000	148,000	-------
Total	‡2,821.3	‡1,080	571,000	634,000	562,000	433,000	465,000	‡4,732	‡8,501	‡5,182	‡5,064	‡3,551.6
Mean	91,010	36,000	18,420	20,450	20,070	13,970	15,500	152,600	283,400	167,200	163,400	118,400
Ac-ft	‡5,596	‡2,142	‡1,133	‡1,258	‡1,115	858,800	922,300	‡9,386	‡16,860	‡10,280	‡10,040	‡7,044

Calendar year 1957: Max 685,000 Min - Mean 121,700 Ac-ft 88,120,000
Water year 1957-58: Max 435,000 Min - Mean 92,050 Ac-ft 66,640,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--No gage-height record Oct. 16 to May 26 (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 3 discharge measurements, weather records, and records for station at Eagle.

4700. Tanana River at Northway Junction

Location.--Lat 63°00', long 141°48', near left bank on downstream side of bridge on highway from Northway Junction to Northway, half a mile southwest of Northway Junction and 4 miles upstream from Nabesna River.

Drainage area.--3,280 sq mi, approximately.

Records available.--Discharge: July 1949 to September 1958.
Chemical analyses: October 1957 to September 1958.
Sediment records: June 1953 to September 1958 (periodic); summer months only 1956-58.

Gage.--Wire-weight gage read once daily. Datum of gage is 1,682.85 ft above mean sea level.

Average discharge.--9 years, 2,217 cfs (1,605,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,030 cfs July 9 (gage height, 11.11 ft); minimum not determined.
1949-58: Maximum discharge observed, 8,860 cfs Aug. 9, 1953 (gage height, 12.10 ft); minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Large diurnal fluctuation caused by glacier melt at the source.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,560							1,300	2,720	5,260	5,800	3,410
2	2,300							1,400	2,820	5,560	5,590	3,330
3	a2,200							1,400	3,300	5,750	5,530	3,160
4	a2,000							1,500	3,320	6,030	5,460	2,960
5	a1,900							1,500	3,520	6,230	6,020	3,070
6	a1,800							1,600	3,600	6,550	6,270	2,840
7	a1,800							1,700	3,890	6,770	6,150	2,680
8	*1,840	1,000	770	860	780	720	960	1,800	4,240	6,930	5,880	2,660
9	1,700							1,900	4,640	7,010	5,820	2,450
10	1,660							2,100	4,630	6,920	6,290	2,510
11	1,650							2,240	4,780	6,740	6,410	2,400
12	1,630							2,300	4,800	6,400	6,450	2,380
13	1,590				(*)		(*)	2,280	4,600	5,700	6,480	2,240
14	1,530	(*)						*2,260	*4,460	5,260	6,380	2,300
15	1,500							2,180	3,990	5,350	6,240	2,540
16	1,500							2,160	3,540	5,500	5,990	2,250
17	1,500							2,120	3,490	5,210	5,870	2,150
18	1,500							2,010	3,330	5,310	5,570	2,130
19	1,400							1,990	3,180	5,350	5,800	2,090
20	1,400							1,980	3,420	5,470	5,670	2,040
21	1,300							2,000	4,000	5,280	5,600	1,970
22	1,300				730			2,020	4,420	5,060	5,560	1,880
23	1,400	850	720	820		650	1,100	2,360	4,590	*4,800	5,400	1,740
24	1,400							2,620	4,580	4,880	5,400	1,760
25	1,400							2,720	4,340	4,770	5,390	1,600
26	1,400							2,710	4,270	4,380	5,250	1,630
27	1,400							2,820	4,150	4,270	4,990	1,680
28	1,300							2,770	4,150	4,320	4,460	1,620
29	1,300				-			2,460	4,460	4,680	4,090	1,520
30	1,200		(*)		-------			2,400	4,940	5,210	*3,750	1,490
31	1,200	-------			-------		-------	2,610	-------	5,770	3,570	-------
Total	49,560	27,750	23,070	26,020	21,190	21,200	30,900	65,210	120,170	172,720	173,130	68,460
Mean	1,599	925	744	839	757	684	1,030	2,104	4,006	5,572	5,585	2,282
Ac-ft	98,300	55,040	45,760	51,610	42,030	42,050	61,290	129,300	238,400	342,600	343,400	135,800

Calendar year 1957: Max 8,580 Min - Mean 2,870 Ac-ft 2,078,000
Water year 1957-58: Max 7,010 Min - Mean 2,190 Ac-ft 1,586,000

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement and weather records.

Note.--Stage-discharge relation affected by ice Oct. 8 to May 10 (no gage-height record Oct. 9, Nov. 1 to Apr. 25, except on occasional days; discharge estimated on basis of 5 discharge measurements and weather records).

4700. TANANA RIVER AT NORTHWAY JUNCTION--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 18, 1957	1,500	14	0.04	44	8.3	5.7	1.4	157	23	2.0	0.1	1.0	176	144	16	292	7.5	15
Nov. 21	850	16	.02	40	14	5.5	1.6	177	23	1.5	.0	1.0	190	158	12	311	7.6	0
Dec. 30	827	15	.05	44	13	6.9	2.9	183	24	4.0	.2	.4	200	163	13	328	7.3	0
Feb. 12, 1958	780	18	.02	45	9.9	5.4	1.7	176	19	1.0	.1	1.0	188	152	8	313	8.2	0
May 6	a 1,700	9.1	.47	31	7.3	3.2	1.1	113	18	.0	.2	.6	b 146	108	15	210	7.5	60
June 4	a 3,480	8.3	.33	32	7.0	3.9	1.2	108	24	1.5	.1	.6	132	109	20	224	7.2	0
June 24	a 4,800	7.6	.09	28	7.0	4.3	.9	101	20	3.0	.0	.0	121	99	16	202	7.2	0
Aug. 27	a 5,070	9.6	.11	34	8.4	4.7	.8	105	36	3.0	.0	.3	149	120	34	235	7.4	40
Sept. 23	a 1,860	11	.04	40	7.9	5.6	.9	123	32	6.0	.3	.2	164	132	32	267	6.8	20

a Discharge at time of sampling.

b Residue on evaporation at 180°C.

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Discharge (tons per day)
Oct. 18, 1957	a 1,500	89	360
May 6, 1958	a 1,600	687	2,970
June 4	3,440	2,070	19,200
June 24	4,620	2,240	27,900
July 20	4,460	2,710	32,600
Aug. 27	4,990	790	10,600
Sept. 23	1,920	329	1,700

a Daily mean discharge.

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of Collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment: Concentration of sample (ppm)	Suspended sediment: Concentration of suspension analyzed (ppm)	Suspended sediment: Percent finer than indicated size, in millimeters: 0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	Methods of analysis
May 6, 1958	--	a 1,600	--	687	505	8	10	16	22	32	52	79	98	--	100		BSWCM
June 4	10:15 a.m.	3,440	58	2,070	1,610	21	24	34	42	57	72	87	98	--	100		PSWCM
June 24	--	4,620	54	2,240	1,330	6	15	34	51	67	80	91	98	--	100		PSWCM
July 20	10:30 a.m.	4,460	54	2,710	3,300	22	37	52	66	78	89	94	99	--	100		PSWCM
Aug. 27	--	4,990	--	790	948	21	24	28	35	44	67	84	98	--	100		BSWCM

a Daily mean discharge.

4760. Tanana River near Tanacross

Location.--Lat 63°23'15", long 143°44'45", on left bank a quarter of a mile downstream from unnamed tributary, a quarter of a mile north of Cathedral Rapids, 8 miles upstream from Robertson River, and 13 miles west of Tanacross.

Drainage area.--8,550 sq mi, approximately.

Records available.--Discharge: June 1953 to September 1958.
Chemical analyses: December 1953 to October 1954, May to September 1957, May to September 1958.
Water temperatures: June to September 1954, May to September 1957, May to September 1958.
Sediment records: October 1953 to September 1954, May to September 1957, and May to September 1958 (daily); October 1954 to September 1956 (periodic).

Gage.--Water-stage recorder. Datum of gage is 1,489.58 ft above mean sea level.

Average discharge.--5 years, 7,719 cfs (5,588,000 acre-ft per year).

Extremes.--Maximum discharge during year, 27,300 cfs July 8 (gage height, 9.54 ft); minimum not determined.
1953-58: Maximum discharge, 35,500 cfs Aug. 9, 1953 (gage height, 11.04 ft); minimum not determined.
1957-58: Maximum water temperature, 65° F June 2, 7, July 3. Maximum daily sediment concentration, 3,740 ppm July 7. Maximum daily sediment load, 266,000 tons July 7.
1956-58: Maximum water temperature, 65° F June 2, 7, July 3, 1958. Maximum daily sediment concentration, 3,740 ppm July 7, 1958. Maximum daily sediment load, 266,000 tons July 7, 1958.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Some diurnal fluctuation caused by glacier melt at the source. Records of specific conductance of daily samples available in district office, Quality of Water Branch, Palmer, Alaska.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8,860							3,600	10,200	17,000	27,000	11,900
2	8,590							3,700	11,500	18,400	26,800	11,600
3	7,990							3,900	13,000	20,000	26,600	11,100
4	7,340							4,100	14,000	21,400	26,400	10,900
5	6,700							4,300	15,100	23,000	22,500	10,800
6	6,110							4,500	15,000	25,800	19,800	10,700
7	5,850						2,300	4,800	15,500	26,400	19,200	10,400
8	*5,850	3,300			2,500	2,000		5,100	15,900	27,000	21,400	10,000
9	5,720							5,500	17,200	26,200	23,600	9,490
10	5,380							5,700	18,600	26,500	24,000	9,040
11	5,200							6,000	18,800	26,400	25,000	8,830
12	5,100							6,200	18,800	25,900	25,200	8,710
13	4,900						*2,590	5,300	18,000	24,100	25,400	8,500
14	4,800	(*)			(*)			*6,340	*16,900	20,400	25,500	8,320
15	4,700		2,500	2,700				6,300	16,400	19,800	25,200	8,230
16	4,700							6,200	15,500	21,600	22,900	8,140
17	4,600							6,100	12,800	23,200	21,100	8,050
18	4,500						2,600	6,000	11,300	23,200	20,700	7,900
19	4,400							6,000	11,400	23,600	20,000	7,790
20	4,200							5,900	11,900	24,600	18,900	7,650
21	4,100							5,900	12,600	25,400	18,200	7,480
22	4,200				2,100			6,300	14,500	26,100	17,800	7,400
23	4,200	2,900					*2,670	6,720	16,400	*25,000	17,400	7,340
24	4,300					1,600		7,420	17,100	22,600	16,900	7,120
25	4,400							8,290	17,100	22,800	16,600	6,860
26	4,500							8,800	15,900	22,300	16,300	6,560
27	4,500						3,000	9,220	14,900	19,600	16,200	6,210
28	4,400							9,400	15,400	19,500	15,600	5,930
29	4,200				-			9,610	15,600	21,400	14,700	5,720
30	4,000				-------			9,190	15,900	21,700	*13,600	5,540
31	3,800	-------	(*)		-------		-------	9,130	------	24,800	12,600	-------
Total	162,090	93,000	77,500	83,700	64,800	55,600	77,260	196,520	453,200	715,700	643,100	254,210
Mean	5,229	3,100	2,500	2,700	2,314	1,794	2,575	6,339	15,110	23,090	20,750	8,474
Ac-ft	321,500	184,500	153,700	166,000	128,500	110,300	153,200	389,800	898,900	‡1,420	‡1,276	504,200

Calendar year 1957: Max 30,800 Min - Mean 9,873 Ac-ft 7,148,000
Water year 1957-58: Max 27,000 Min - Mean 7,881 Ac-ft 5,707,000

* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--No gage-height record Oct. 11-14, Nov. 11 to May 22, except on occasional days (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 6 discharge measurements, weather records, and records for station at Northway Junction. Stage-discharge relation affected by ice Oct. 3-10, Oct. 15 to Nov. 10.

4760. TANANA RIVER NEAR TANACROSS--Continued

Chemical analyses, in parts per million, November 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Nov. 21, 1957	2,900	17	0.02	40	16	6.2	2.6	186	26	2.0	0.2	0.9	203	166	13	330	7.4	0
Dec. 31	2,500	17	.02	42	14	6.3	2.5	184	24	2.5	.0	1.4	201	162	12	332	7.5	0
Feb. 12, 1958	2,500	20	.02	48	12	5.4	1.9	190	24	3.0	.1	.7	209	170	14	332	7.2	0
May 6	4,500	9.9	.21	31	7.3	4.3	1.1	113	18	1.5	.2	.8	130	108	15	213	7.5	40
May 7-17	5,870	15	.09	34	6.0	5.2	1.4	121	17	2.0	.2	.9	142	110	10	234	7.1	25
May 18-25	6,570	19	.08	35	5.9	5.4	1.6	122	20	2.0	.1	.7	150	112	12	238	7.3	25
May 26-31	9,220	13	.08	34	6.0	6.0	1.8	118	22	4.0	.1	.7	146	110	13	238	7.3	10
June 1-4	12,200	13	.07	32	10	5.4	1.6	124	22	4.0	.1	.8	150	121	20	252	6.8	5
June 5-11	16,600	13	.07	31	6.4	6.0	1.6	110	20	4.0	.1	.7	137	104	14	225	7.3	5
June 24	17,100	8.6	.39	22	6.3	5.5	1.4	86	16	4.0	.2	.2	106	81	10	171	7.5	10
June 25-30	15,800	11	.02	25	6.4	4.6	1.4	103	15	3.0	.0	.6	118	89	4	197	7.1	0
July 1-10	23,200	9.2	.04	25	5.2	4.6	1.5	96	14	2.5	.0	.6	110	84	6	187	7.3	0
July 11-17	23,000	9.4	.02	25	5.0	4.8	1.4	95	14	2.5	.0	.5	110	83	5	187	7.3	0
July 18-20	23,800	9.8	.06	24	5.4	4.6	1.2	94	13	2.5	.0	.3	107	82	5	179	7.6	0
July 21-31	22,800	10	.08	24	5.1	4.4	1.3	94	14	2.0	.0	.6	107	81	4	182	7.4	0
Aug. 1-10	23,700	9.7	.09	27	5.0	4.6	1.3	94	21	2.0	.0	.4	117	88	11	200	7.6	0
Aug. 11-20	23,000	10	.26	26	7.7	4.6	1.4	98	24	2.0	.0	.5	125	96	16	207	7.6	0
Aug. 21-24, 27-31	15,900	14	.03	34	7.7	5.8	.9	112	34	2.0	.0	.7	154	116	24	252	7.8	0
Sept. 1-4, 6	11,200	14	.04	34	7.7	6.2	1.0	118	34	3.0	.0	1.2	159	116	20	253	7.8	0
Sept. 23	7,340	11	.02	36	9.8	6.7	1.0	132	31	3.5	.3	.3	165	130	22	273	7.4	10

4760. TANANA RIVER NEAR TANACROSS--Continued

Temperature (°F) of water, water year October 1957 to September 1958
(Once-daily measurement at approximately 6 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								--	62	62	51	48
2								--	65	61	52	49
3								--	62	65	54	49
4								--	64	61	50	50
5								--	60	64	51	42
6								35	58	62	52	42
7								38	65	63	53	45
8								40	63	61	54	45
9								40	60	58	55	49
10								40	58	57	54	49
11								40	58	54	55	51
12		32						40	55	54	54	47
13								44	56	55	54	48
14								43	60	56	54	49
15								45	56	58	53	45
16								46	57	54	52	45
17								46	58	55	50	43
18	33							45	57	54	49	38
19								48	63	53	--	42
20								52	63	55	--	40
21								53	63	54	--	39
22								57	60	55	--	38
23								56	60	55	--	--
24								55	56	54	--	--
25								55	56	54	--	--
26								50	57	56	--	--
27								54	58	57	49	--
28								55	59	54	50	--
29								58	56	53	49	--
30								58	61	52	49	--
31			32					60	--	52	49	--
Average								49	60	57	--	--

4760. TANANA RIVER NEAR TANACROSS--Continued

Suspended sediment, May to September 1958

Day	May			June			July		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	--	--	--	10,200	1,360	37,400	17,000	1,820	83,500
2	--	--	--	11,500	1,660	51,500	18,400	2,360	117,000
3	--	--	--	13,000	1,820	63,900	20,000	2,900	157,000
4	--	--	--	14,000	1,920	72,600	21,400	3,280	190,000
5	--	--	--	15,100	1,630	66,400	23,000	3,300	205,000
6	--	--	--	15,000	1,530	62,000	25,800	3,600	251,000
7	4,800	867	11,200	15,500	1,600	67,000	26,400	3,740	266,000
8	5,100	828	11,400	15,900	1,660	71,300	27,000	3,460	252,000
9	5,500	918	13,600	17,200	1,980	92,000	26,200	3,010	213,000
10	5,700	637	9,800	18,600	2,720	136,000	26,500	2,840	203,000
11	6,000	508	8,230	18,800	3,050	a155,000	26,400	2,530	180,000
12	6,200	472	7,900	18,800	2,750	140,000	25,900	2,370	166,000
13	6,300	450	7,650	18,000	2,060	100,000	24,100	2,410	157,000
14	6,340	469	8,030	16,900	1,620	73,900	20,400	2,200	121,000
15	6,300	420	7,140	16,400	1,500	66,400	19,800	1,830	97,800
16	6,200	388	6,500	15,500	1,350	56,500	21,600	2,170	126,000
17	6,100	373	6,140	12,800	1,060	36,600	23,200	2,580	162,000
18	6,000	400	6,480	11,300	970	29,600	23,200	2,350	147,000
19	6,000	392	6,350	11,400	979	30,100	23,600	2,130	136,000
20	5,900	389	6,200	11,900	1,060	34,000	24,600	2,380	158,000
21	5,900	407	6,480	12,600	1,190	40,500	25,400	2,510	172,000
22	6,300	420	7,140	14,500	1,640	64,200	26,100	2,500	176,000
23	6,720	584	10,600	16,400	2,120	93,900	25,000	1,980	134,000
24	7,420	713	14,300	17,100	2,450	113,000	22,600	1,790	109,000
25	8,290	827	18,500	17,100	2,230	103,000	22,800	1,950	120,000
26	8,800	917	21,800	15,900	1,630	70,000	22,300	2,070	125,000
27	9,220	806	20,100	14,900	1,470	59,100	19,600	1,850	97,900
28	9,400	748	19,000	15,400	1,480	61,500	19,500	1,810	95,300
29	9,610	811	21,000	15,600	1,400	59,000	21,400	1,710	98,800
30	9,190	701	17,400	15,900	1,400	60,100	21,700	1,960	115,000
31	9,130	634	15,600	--	--	--	24,800	3,370	226,000
Total	172,420	--	288,540	453,200	--	2,166,500	715,700	--	4,857,300

Day	August			September					
1	27,000	3,420	249,000	11,900	829	26,600			
2	26,800	2,700	195,000	11,600	777	24,300			
3	26,600	2,320	167,000	11,100	665	19,900			
4	26,400	2,200	157,000	10,900	634	18,600			
5	22,500	1,770	108,000	10,800	616	18,000			
6	19,800	1,560	83,400	10,700	570	16,500			
7	19,200	1,410	73,100	10,400	545	15,300			
8	21,400	2,150	124,000	10,000	529	14,300			
9	23,600	1,960	125,000	9,490	434	11,100			
10	24,000	1,840	119,000	9,040	427	10,400			
11	25,000	2,020	136,000	8,830	441	10,500			
12	25,200	2,080	142,000	8,710	352	8,280			
13	25,400	1,960	134,000	8,500	382	8,770			
14	25,500	2,090	144,000	8,320	370	8,310			
15	25,200	2,190	149,000	8,230	315	7,000			
16	22,900	1,850	114,000	8,140	371	8,150			
17	21,100	1,580	90,000	8,050	364	7,910			
18	20,700	1,490	a83,300	7,900	333	7,100			
19	20,000	1,410	a76,100	7,790	338	7,110			
20	18,900	1,280	a65,300	7,650	310	6,400			
21	18,200	1,200	a59,000	7,480	313	6,320			
22	17,800	1,150	a55,300	7,400	324	a6,470			
23	17,400	1,100	a51,700	--	--	--			
24	16,900	1,040	a47,400	--	--	--			
25	16,600	1,010	a45,300	--	--	--			
26	16,300	970	a42,700	--	--	--			
27	16,200	875	a38,300	--	--	--			
28	15,600	911	38,400	--	--	--			
29	14,700	867	34,400	--	--	--			
30	13,600	900	33,000	--	--	--			
31	12,600	906	30,800	--	--	--			
Total	643,100	--	3,010,500	202,930	--	267,320			

Total discharge for period (cfs-days) 2,187,350
Total load for period (tons) 10,590,160

a Computed from estimated concentration graph.

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analyzis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
May 6, 1958 ...		a4,500	--	994	756	10	12	18	25	32	49	64	81		97	100	BSWCM
June 4		13,800	--	1,830	2,640	14	19	29	42	56	69	79	88		98	100	PSWCM
June 24		a17,100	56	1,860	3,000	31	38	52	62	71	79	87	98		100	--	PSWCM
July 20		a24,600	--	2,200	3,990	30	41	55	68	75	82	88	98		100	--	PSWCM
Aug. 27.....		15,800	50	794	877	20	22	30	41	52	62	72	94		100	---	PSWCM

a Daily mean discharge.

550195 O - 60 - 7

4840. Salcha River near Salchaket

Location.--Lat 64°28'15", long 146°55'45", in sec.22, T.5 S., R.4 E., near right bank on downstream side of bridge on Richardson Highway, half a mile east of Aurora Lodge, 2 miles upstream from mouth, and 6 miles southeast of Salchaket.

Drainage area.--2,170 sq mi, approximately.

Records available.--Discharge: July 1909 to August 1910 (no winter records), published as "at mouth," October 1948 to September 1958.
Chemical analyses: October 1957 to May 1958.

Gage.--Water-stage recorder. Datum of gage is 631.85 ft above mean sea level. July 1909 to August 1910, staff gage at site 1¼ miles downstream at different datum. Sept. 7, 1948, to Apr. 24, 1953, wire-weight gage at present site and datum.

Average discharge.--10 years (1948-58), 1,654 cfs (1,197,000 acre-ft per year).

Extremes.--Maximum discharge during year, 23,100 cfs May 25 (gage height, 13.66 ft); minimum not determined.
1909-10, 1948-58: Maximum discharge, 36,500 cfs June 23, 1956 (gage height, 16.13 ft), from rating curve extended above 16,000 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for period of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	784							5,000	3,240	570	2,060	784
2	776							3,780	3,360	535	2,480	776
3	752							2,590	3,640	507	2,190	760
4	752							1,900	3,540	479	1,950	744
5	705			(*)				1,570	2,850	451	1,770	744
6	668							1,580	2,360	444	1,580	744
7	652							1,890	2,030	458	1,470	736
8	690	520	390	240	120	78	190	2,660	1,880	570	1,670	728
9	682							3,980	2,340	800	1,650	728
10	675							3,620	2,640	738	1,500	736
11	*698							3,080	2,030	668	1,390	720
12	712						(*)	2,860	1,650	615	1,300	720
13	682							2,740	1,360	578	1,220	705
14	668							2,700	1,240	535	1,130	705
15	668							*2,700	1,200	507	1,080	728
16	652							2,740	*1,120	500	1,040	752
17	507				(*)			2,560	1,050	493	1,060	800
18	592							2,430	988	486	1,080	816
19	660	(*)						2,390	961	479	1,050	784
20	700							3,040	925	486	1,030	768
21	710							3,800	848	493	1,020	768
22	720				81		420	4,550	784	528	997	760
23	710	510	270	170		84		5,140	728	600	952	744
24	680							5,910	690	*638	907	744
25	630							18,300	652	645	880	728
26	590							9,710	622	645	*856	720
27	550							5,160	592	622	840	705
28	520						800	4,040	576	615	824	698
29	490				-		1,260	3,620	592	592	816	682
30	480				-------		2,720	2,830	608	600	808	675
31	470	-------			-------		------	2,880	-------	744	800	-------
Total	20,225	15,450	10,170	6,320	2,853	2,514	12,670	121,750	47,098	17,621	39,400	22,202
Mean	652	515	328	204	102	81.1	422	3,927	1,570	568	1,271	740
Ac-ft	40,120	30,640	20,170	12,540	5,660	4,990	25,130	241,500	93,420	34,950	78,150	44,040

Calendar year 1957: Max 26,300 Min - Mean 1,237 Ac-ft 895,700
Water year 1957-58: Max 18,300 Min - Mean 872 Ac-ft 631,300

Peak discharge (base, 10,000 cfs).--May 25 (8:30 p.m.) 23,100 cfs (13.66 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 19 to Apr. 30 (no gage-height record Oct. 31 to Apr. 11 except occasional days Apr. 20-27; discharge estimated on basis of 4 discharge measurements, weather records, and records for Chena River at Fairbanks).

4840. SALCHA RIVER NEAR SALCHAKET--Continued

Chemical analyses, in parts per million, October 1957 to May 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 19, 1957	660	8.0	0.03	18	4.4	2.6	1.4	62	16	1.5	0.1	1.2	84	63	12	145	7.4	7
Jan. 5, 1958	240	9.7	.07	19	6.2	4.7	2.8	75	19	3.0	.0	1.4	103	73	12	182	7.4	5
Feb. 13	120	9.5	.02	19	5.7	2.8	1.5	68	20	1.5	.2	2.2	95	71	16	152	6.5	5
May 7	1,890	4.5	.16	16	3.7	1.2	1.0	48	17	.5	.2	.8	a87	55	16	119	6.7	45

a Residue on evaporation at 180°C.

5140. Chena River at Fairbanks

Location.--Lat 64°50'50", long 147°42'20", in NW¼ sec.11, T.1 S., R.1 W., on downstream side of second pier from right bank of bridge on Steese Highway (U. S. Highway 97) in Fairbanks, 0.15 mile upstream from Noyes Slough, 11 miles upstream from mouth, and 11 miles downstream from Chena Slough. Prior to Nov. 18, 1957, at bridge 0.5 mile downstream.

Drainage area.--1,980 sq mi, approximately.

Records available.--Discharge: July 1947 to September 1948 (no winter records), October 1948 to September 1958.
Chemical analyses: May to September 1953, April to September 1955, October 1957 to May 1958.
Water temperatures: May to September 1953.
Sediment records: January to August 1954, April to September 1955 (periodic).

Gage.--Water-stage recorder. Datum of gage is 422.72 ft above mean sea level. Prior to May 3, 1948, staff gage, May 4, 1948 to Nov. 17, 1957, wire-weight gage at bridge 0.5 mile downstream at datum 0.96 ft higher.

Average discharge.--10 years, 1,378 cfs (997,600 acre-ft per year).

Extremes.--Maximum discharge during year, 6,560 cfs May 26 (gage height, 6.77 ft); minimum not determined.
1947-58: Maximum discharge, 24,200 cfs May 21, 1948 (gage height, 14.17 ft, site and datum then in use, from graph based on gage readings); minimum not determined.
Flood in August 1930 reached a stage of about 14.2 ft, site and datum then in use, from information by local residents. Flood of May 11-14, 1937, reached a stage of 14.9 ft, ice jam, site and datum then in use, from floodmarks.

Remarks.--Records good except those for period of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	581	300					150	2,200	1,790	645	918	909
2	592	310		(*)			150	3,660	1,700	638	1,920	892
3	598	310					162	3,170	1,640	638	2,320	884
4	581	320					168	2,440	1,590	632	2,280	858
5	570	330					172	1,940	1,540	625	2,110	850
6	548	340					179	1,760	1,450	606	1,880	842
7	550	340					185	1,660	1,360	612	1,710	834
8	570	340		280	170		192	2,270	1,260	721	1,730	826
9	*581	320					203	3,020	1,210	811	1,940	818
10	581	310					*213	3,300	1,140	858	1,850	811
11	554	300					228	3,030	1,090	818	1,720	802
12	548	300					239	2,740	1,030	750	1,610	802
13	480	300					250	2,560	998	706	1,520	795
14	470	310					265	2,490	943	679	1,430	802
15	450	*320					289	2,400	909	652	1,350	818
			240			120						
16	440	330					314	*2,400	*875	632	1,280	826
17	440	330			(*)		327	2,310	850	612	1,250	858
18	440	340					354	2,170	818	606	1,280	875
19	450	340					372	2,030	803	593	1,250	875
20	460	340					387	2,020	779	587	1,240	858
21	480	330					392	2,130	757	600	1,210	850
22	490	320			130		377	2,250	728	600	1,190	850
23	480	310					377	2,500	713	606	1,140	842
24	460	300		230			396	2,540	699	*645	1,130	834
25	430	290					416	4,040	686	686	1,090	818
26	400	280					437	5,810	672	699	*1,040	811
27	370	280					469	3,750	665	692	1,020	802
28	340	270					562	2,840	645	665	988	795
29	320	260			-		787	2,480	638	652	934	779
30	310	250			-------		1,300	2,170	638	658	934	779
31	300	-------			-------		-------	1,920	-------	699	918	-------
Total	14,864	9,320	7,440	7,880	4,240	3,720	10,312	82,200	30,616	20,623	44,182	24,995
Mean	479	311	240	254	151	120	344	2,652	1,021	665	1,425	833
Ac-ft	29,480	18,490	14,760	15,630	8,410	7,380	20,450	163,000	60,730	40,910	87,630	49,580

Calendar year 1957: Max 13,400 Min - Mean 977 Ac-ft 707,500
Water year 1957-58: Max 5,810 Min - Mean 713 Ac-ft 516,400

Peak discharge (base, 5,000 cfs).--May 26 (7 a.m.) 6,560 cfs (6.77 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 14 to Apr. 16 (no gage-height record Nov. 4-9, Nov. 20 to Apr. 2; discharge estimated on basis of 3 discharge measurements and weather records).

5140. CHENA RIVER AT FAIRBANKS--Continued

Chemical analyses, in parts per million, October 1957 to May 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 19, 1957	450	13	0.14	27	7.8	3.8	1.8	100	21	1.5	0.2	1.1	126	100	18	204	7.2	7
Nov. 24	300	14	.02	28	8.4	3.5	1.8	110	19	1.0	.2	1.4	131	104	14	209	7.5	0
Jan. 2, 1958	a280	18	.29	31	9.5	4.8	2.0	131	13	3.5	.0	1.8	148	116	9	239	7.9	20
Feb. 13	170	21	.02	34	7.9	4.0	2.0	134	14	1.0	.2	1.4	152	118	8	241	6.8	20
Apr. 11	228	20	.02	31	12	4.9	2.5	151	14	2.5	.1	.3	161	127	4	252	6.8	10
May 7	1,860	6.0	.18	22	4.4	1.6	1.2	66	19	.5	.2	.5	b105	73	19	151	7.0	40

a Discharge at time of sampling.
b Residue on evaporation at 180°C.

5180. Nenana River near Healy

Location.--Lat 63°50'40", long 148°56'35", in W½ sec.28, T.12 S., R.7 W., on right bank half a mile upstream from Healy Creek, 1.1 miles southeast of Healy, and 1.2 miles upstream from railroad bridge.

Drainage area.--1,910 sq mi, approximately.

Records available.--Discharge: October 1950 to September 1958.
Chemical analyses: October 1953 to September 1955, May 1956 to September 1957, May to September 1958.
Water temperatures: May to September 1957, May to September 1958.
Sediment records: 1953-58 (summer months only).

Gage.--Water-stage recorder. Datum of gage is 1,270.22 ft above mean sea level.

Average discharge.--8 years, 3,575 cfs (2,588,000 acre-ft per year).

Extremes.--Maximum discharge during year, 16,500 cfs Aug. 3 (gage height, 8.90 ft); minimum not determined.
1950-58: Maximum discharge, 28,500 cfs July 29, 1952; maximum gage height, 10.86 ft Aug. 25, 1955; minimum discharge not determined.
1958: Maximum water temperature, 55° F July 4. Maximum daily sediment concentration, 3,810 ppm July 25. Maximum daily sediment load, 105,000 tons Aug. 1.
1957-58: Maximum water temperature, 56° F Aug. 9, 1957.
1953-58: Maximum daily sediment concentration, 7,910 ppm June 25, 1953. Maximum daily sediment loads, 585,000 tons June 25, 1953.

Remarks.--Records good except those for periods of shifting-control, which are fair, and those for periods of ice effect or no gage-height record, which are poor. Some diurnal fluctuation caused by glacier melt at the source. Records of specific conductance of daily samples available in district office, Quality of Water Branch, Palmer, Alaska.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,920	2,310						1,200	10,900	6,080	14,100	3,590
2	2,800	2,290						1,300	13,800	*6,470	13,300	3,610
3	2,610	2,250						1,400	12,900	7,140	15,700	3,490
4	*2,550	2,240					(*)	1,400	12,900	7,770	14,800	3,310
5	2,560	2,220						1,400	12,500	8,390	12,400	3,130
6	2,480	*2,150						1,400	13,900	8,440	11,300	3,020
7	2,480	2,140						1,300	15,500	8,020	10,700	3,130
8	2,470	2,070	1,800	890	480	390	450	1,300	15,700	8,190	9,770	3,020
9	2,480	1,990						1,300	14,600	8,000	9,930	2,850
10	2,500	1,900						1,300	12,600	6,700	9,960	2,760
11	2,420	1,800						1,300	10,500	6,620	9,070	2,730
12	2,310	1,700						1,400	10,500	5,690	8,560	2,710
13	2,210	1,500						1,500	10,100	5,360	8,000	2,760
14	2,100	1,400						1,600	8,360	6,000	7,490	2,760
15	2,250	1,600						1,700	7,220	5,320	7,580	2,800
16	2,310	1,800						1,900	8,020	5,170	7,240	2,730
17	2,310	1,900						2,100	10,800	8,190	6,570	2,610
18	2,340	1,900	(*)					2,380	8,560	9,770	6,490	2,530
19	2,550	1,800						2,950	8,300	9,070	6,540	2,460
20	2,520	1,600						3,610	9,340	8,020	6,520	2,420
21	2,440	1,500						4,700	11,500	7,330	6,520	2,410
22	2,800	1,400			430			6,470	10,600	7,460	7,000	2,320
23	2,950	1,400					650	6,950	8,740	*7,800	6,180	2,340
24	2,630	1,300	1,000	660		350		6,570	7,600	7,660	6,080	2,420
25	2,580	1,300						6,340	7,080	6,730	5,760	2,360
26	2,400	1,300						6,340	7,550	6,310	5,520	2,290
27	2,220	1,400						4,930	7,490	6,870	*5,000	2,250
28	2,410	1,500						4,030	7,140	9,700	4,500	2,310
29	2,470	1,600			-			4,140	6,810	12,900	4,180	2,470
30	2,400	1,700			-------			*4,980	6,280	12,300	4,010	2,380
31	2,210	-------		(*)	-------		-------	7,940	-------	12,500	3,790	-------
Total	76,680	52,960	43,000	23,910	12,790	11,450	16,500	97,130	307,790	241,970	254,560	81,970
Mean	2,474	1,765	1,387	771	457	369	550	3,133	10,260	7,805	8,212	2,732
Ac-ft	152,100	105,000	85,290	47,420	25,370	22,710	32,730	192,700	610,500	479,900	504,900	162,600

Calendar year 1957: Max 19,100 Min - Mean 3,842 Ac-ft 2,782,000
Water year 1957-58: Max 15,700 Min - Mean 3,344 Ac-ft 2,421,000

Peak discharge (base, 12,000 cfs).--June 8 (9 a.m.) 16,400 cfs (8.67 ft); Aug. 3 (10 p.m.) 16,500 cfs (8.90 ft).

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 10 to May 17 (no gage-height record Dec. 19 to May 6; discharge estimated on basis of 3 discharge measurements, weather records, and records for Matanuska River at Palmer). Shifting-control method used Oct. 1, 2, May 18 to June 19.

5180. NENANA RIVER NEAR HEALY--Continued

Chemical analyses, in parts per million, December 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Dec. 17, 1957	1,800	8.9	0.02	35	9.0	5.6	2.1	106	47	2.5	0.1	0.4	163	124	38	269	7.5	0
Apr. 4, 1958	a416	3.0	.02	40	16	4.4	1.9	80	112	1.5	.2	.6	219	166	100	349	7.6	0
May 24-31	5,660	6.9	.03	20	4.2	2.4	1.4	61	20	1.0	.2	.0	86	67	17	148	6.3	10
June 1-10	13,500	5.8	.03	23	4.3	2.0	1.7	60	26	1.0	.2	.4	94	75	26	165	6.7	10
June 11-20	9,170	6.6	.02	27	5.0	2.9	2.9	64	38	1.5	.2	2.0	118	88	36	201	6.6	5
June 21-22, 24-27	8,640	6.3	.06	27	5.7	2.1	2.0	66	38	1.0	.2	.4	115	91	37	200	6.7	5
July 3-10	7,830	6.5	.02	30	5.8	2.0	3.0	74	44	1.0	.3	.4	129	99	38	212	6.5	0
July 11-20	6,920	6.4	.02	26	5.3	2.2	2.0	64	38	1.0	.1	.5	114	87	34	193	7.2	0
July 21-31	8,870	6.5	.02	28	5.3	2.3	2.9	68	39	1.0	.0	.5	118	92	36	203	7.3	0
Aug. 1-6	13,600	8.5	.03	26	5.8	2.4	2.0	65	40	1.0	.1	.5	118	89	36	202	7.4	0
Aug. 10-20	7,640	7.4	.03	27	5.7	2.6	2.3	68	40	1.0	.1	.6	120	91	36	203	7.3	0
Aug. 21-31	5,320	11	.03	28	7.0	3.2	1.9	73	42	1.0	.1	.5	131	99	39	220	7.4	0
Sept. 1-10	3,190	9.6	.02	32	7.0	3.8	2.0	82	45	1.0	.1	.5	141	109	42	238	7.4	0
Sept. 11-20	2,650	11	.04	33	7.3	3.6	1.8	87	45	1.5	.1	.6	147	112	42	250	7.6	0
Sept. 21-30	2,360	11	.04	33	7.6	3.7	1.8	88	44	2.0	.1	.3	146	114	42	245	7.4	0

a Discharge at time of sampling.

5180. NENANA RIVER NEAR HEALY--Continued

Temperature (°F) of water, December 1957 to September 1958
(Once-daily measurement at approximately 6 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								--	48	--	47	43
2								--	48	--	46	44
3								--	49	53	48	44
4									50	55	47	43
5								--	50	54	48	44
6								--	50	53	48	42
7								--	49	52	--	43
8								--	47	51	--	44
9								--	48	49	--	42
10								--	46	50	49	42
11								--	46	49	49	42
12								--	44	48	49	42
13								--	42	48	50	42
14								--	40	47	50	43
15								--	41	46	49	41
16			32					--	42	47	49	41
17								--	43	50	50	40
18								--	42	52	50	40
19								--	44	50	50	41
20								--	43	49	49	39
21								--	46	50	50	40
22								--	48	49	49	38
23								--	--	49	49	37
24								42	49	50	48	37
25								43	48	51	47	36
26								43	48	--	45	36
27								44	50	48	45	34
28								44	--	50	44	35
29								45	--	48	44	34
30								47	--	48	45	34
31								48	--	48	44	--
Average								--	46	50	48	40

5180. NENANA RIVER NEAR HEALY--Continued

Suspended sediment, May to September 1958

Day	May			June			July		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	--	--	--	10,900	2,240	65,900	6,080	1,770	29,000
2	--	--	--	13,800	672	25,000	6,470	1,710	29,900
3	--	--	--	12,900	349	12,200	7,140	1,770	34,100
4	--	--	--	12,900	1,470	51,200	7,770	2,070	43,400
5	--	--	--	12,500	1,510	51,000	8,390	2,150	48,700
6	--	--	--	13,900	1,130	42,400	8,440	2,190	49,900
7	--	--	--	15,500	1,620	67,800	8,020	2,180	47,200
8	--	--	--	15,700	1,100	46,600	8,190	1,760	38,900
9	--	--	--	14,600	775	30,600	8,000	1,400	30,200
10	--	--	--	12,600	635	21,600	6,700	1,050	19,000
11	--	--	--	10,600	495	14,000	6,620	833	14,900
12	--	--	--	10,500	405	11,500	5,690	977	15,000
13	--	--	--	10,100	355	9,680	5,360	760	11,000
14	--	--	--	8,360	481	10,800	6,000	635	10,300
15	--	--	--	7,220	481	9,380	5,320	666	9,570
16	1,900	175	898	8,020	575	12,400	5,170	1,140	15,900
17	2,100	125	709	10,800	481	14,000	8,190	1,390	30,700
18	2,380	225	1,440	8,560	725	16,800	9,770	940	24,800
19	2,950	850	6,770	8,300	775	17,400	9,070	1,060	26,000
20	3,610	1,130	11,000	9,340	806	20,300	8,020	1,690	36,600
21	4,700	1,000	12,700	11,500	555	17,200	7,330	742	14,700
22	6,470	415	7,250	10,600	547	15,600	7,460	457	9,200
23	6,950	340	6,380	8,740	620	14,600	7,800	683	14,400
24	6,570	380	6,740	7,600	580	11,900	7,660	3,050	63,100
25	6,340	170	2,910	7,080	431	8,240	6,730	3,810	69,200
26	6,340	260	4,450	7,550	389	7,930	6,310	1,810	30,800
27	4,930	155	2,060	7,490	513	10,400	6,870	1,570	29,100
28	4,030	100	1,090	7,140	1,570	30,300	9,700	2,410	63,100
29	4,140	145	1,620	6,810	1,650	30,300	12,900	2,520	87,800
30	4,980	424	5,700	6,280	2,000	33,900	12,300	2,130	70,700
31	7,940	1,870	40,100				12,500	2,110	71,200
Total	76,330	--	111,817	307,790	--	730,930	241,970	--	1,088,370

Day	August			September		
1	14,100	2,770	105,000	3,590	54	523
2	13,300	1,850	66,400	3,610	63	614
3	15,700	990	42,000	3,490	32	302
4	14,800	865	34,600	3,310	46	411
5	12,400	675	22,600	3,130	67	566
6	11,300	635	19,400	3,020	30	245
7	10,700	665	19,200	3,130	30	254
8	9,770	679	17,900	3,020	42	342
9	9,930	600	16,100	2,850	34	262
10	9,960	850	22,800	2,760	28	209
11	9,070	830	20,300	2,730	25	184
12	8,560	695	16,100	2,710	16	117
13	8,000	632	13,600	2,760	14	104
14	7,490	462	9,340	2,760	14	104
15	7,580	446	9,130	2,800	16	121
16	7,240	429	8,390	2,730	22	162
17	6,570	448	7,950	2,610	21	148
18	6,490	461	8,080	2,530	23	157
19	6,540	308	5,440	2,460	23	153
20	6,520	481	8,470	2,420	18	118
21	6,520	333	5,860	2,410	18	117
22	7,000	214	4,040	2,320	8	50
23	6,180	232	3,870	2,340	7	44
24	6,080	439	7,210	2,420	11	72
25	5,760	170	2,640	2,360	10	64
26	5,520	179	2,670	2,290	35	216
27	5,000	83	1,120	2,250	43	261
28	4,500	53	644	2,310	64	399
29	4,180	125	1,410	2,470	23	153
30	4,010	124	1,340	2,380	8	51
31	3,790	121	1,240	--	--	--
Total	254,560	--	504,844	81,970	--	6,523

Total discharge for period (cfs-days) 962,620
Total load for period (tons) 2,442,484

5180. NENANA RIVER NEAR HEALY--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet, S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
July 23, 1958...	9:00 p.m.	a 6,950		903	808	9	14	20	29	38	49	58	74		90	100	BSWCM

a Daily mean discharge.

5648. Yukon River at Ruby

Location.--Lat 64°44'25", long 155°29'55", on left bank at Ruby, 300 ft downstream from Ruby Creek, 2 miles downstream from Melozitna River, and 2½ miles upstream from Ruby Slough.

Drainage area.--259,000 sq mi, approximately.

Records available.--October 1956 to September 1958.

Gage.--Staff gage read twice daily. Altitude of gage is 150 ft (from topographic map).

Extremes.--Maximum discharge during year, 468,000 cfs June 3 or 4 (gage height, 25.00 ft, from floodmarks); minimum not determined.
1956-58: Maximum discharge, 753,000 cfs June 3 or 4, 1957 (gage height, 32.4 ft, from floodmarks), from rating curve extended above 570,000 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	196,000								450,000	266,000	253,000	217,000
2	186,000								450,000	264,000	256,000	216,000
3	179,000								460,000	260,000	261,000	212,000
4	171,000								460,000	256,000	268,000	207,000
5	166,000								450,000	256,000	273,000	201,000
6	164,000					(*)			440,000	256,000	277,000	197,000
7	161,000						(*)		420,000	254,000	280,000	194,000
8	156,000	67,000	36,000	41,000		24,000	26,000	49,000	410,000	253,000	281,000	190,000
9	153,000								400,000	253,000	284,000	188,000
10	150,000								390,000	254,000	292,000	186,000
11	148,000								380,000	254,000	295,000	183,000
12	147,000								370,000	256,000	292,000	181,000
13	145,000								360,000	260,000	284,000	178,000
14	142,000								350,000	261,000	277,000	174,000
15	b140,000				33,000				350,000	260,000	272,000	172,000
16	b140,000								340,000	254,000	264,000	170,000
17	b130,000								*339,000	251,000	258,000	*168,000
18	b130,000								334,000	247,000	252,000	166,000
19	b120,000								326,000	248,000	246,000	163,000
20	b120,000			(*)					320,000	245,000	242,000	162,000
21	b120,000								315,000	240,000	237,000	159,000
22	b120,000								306,000	236,000	233,000	156,000
23	b120,000	57,000	31,000	36,000		22,000	31,000	280,000	298,000	235,000	228,000	153,000
24	b120,000								290,000	236,000	226,000	152,000
25	b120,000								285,000	*238,000	227,000	150,000
26	b120,000								280,000	240,000	229,000	149,000
27	b110,000								275,000	242,000	227,000	147,000
28	b110,000								268,000	242,000	*225,000	146,000
29	b100,000				-				262,000	242,000	221,000	*146,000
30	b95,000				-------				264,000	245,000	217,000	142,000
31	b87,000	-------		-------	-------		-------		-------	250,000	216,000	-------
Total	$4,266	$1,860	$1,036	$1,191	924,000	712,000	855,000	$5,215	$10,642	$7,754	$7,893	$5,225
Mean	137,600	62,000	33,420	38,420	33,000	22,970	28,500	168,200	354,700	250,100	254,600	174,200
Ac-ft	$8,461	$3,689	$2,055	$2,362	$1,833	$1,412	$1,696	$10,340	$21,110	$15,380	$15,660	$10,360

Calendar year 1957: Max 750,000 Min - Mean 169,600 Ac-ft 122,800,000
Water year 1957-58: Max 460,000 Min - Mean 130,300 Ac-ft 94,360,000

* Discharge measurement made on this day.
$ Expressed in thousands.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Nov. 2 to June 16 except on occasional days (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 3 discharge measurements, weather records, and records for stations at Eagle and Rampart.

5652. Yukon River at Kaltag

Location.--Lat 64°19'40", long 158°43'10", on right bank at Kaltag, 0.5 mile downstream from Kaltag River. Prior to Oct. 1, 1957, at site 4.3 miles downstream.

Drainage area.--296,000 sq mi, approximately.

Records available.--October 1956 to September 1958.

Gage.--Staff gage read twice daily. Altitude of gage is 100 ft (from topographic map). Prior to Oct. 1, 1957, at site 4.3 miles downstream at different datum.

Extremes.--Maximum discharge during year, 521,000 cfs June 5 or 6 (gage height, 17.50 ft, from floodmarks); minimum not determined.
1956-58: Maximum discharge, 1,020,000 cfs June 5, 1957 (gage height, 30.02 ft, from graph based on gage readings), from rating curve extended above 860,000 cfs by logarithmic plotting; minimum not determined.

Remarks.--Records good except those for period of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	277,000								500,000	335,000	301,000	276,000
2	260,000								500,000	329,000	306,000	277,000
3									510,000	326,000	314,000	276,000
4									510,000	319,000	317,000	276,000
5									520,000	312,000	322,000	273,000
6						(*)			520,000	306,000	327,000	270,000
7									510,000	303,000	332,000	268,000
8		94,000	48,000	55,000	42,000	32,000	*31,000	62,000	510,000	300,000	338,000	263,000
9	220,000								510,000	296,000	345,000	259,000
10									500,000	293,000	352,000	254,000
11									500,000	292,000	362,000	252,000
12									490,000	291,000	372,000	247,000
13									480,000	292,000	379,000	241,000
14									480,000	294,000	377,000	239,000
15									470,000	296,000	372,000	238,000
16									460,000	298,000	365,000	229,000
17									*459,000	297,000	358,000	*220,000
18				(*)					449,000	294,000	352,000	218,000
19									435,000	291,000	347,000	215,000
20									421,000	291,000	340,000	210,000
21									410,000	289,000	333,000	208,000
22					43,000				403,000	286,000	324,000	200,000
23		80,000					37,000		398,000	281,000	320,000	200,000
24	170,000		44,000	47,000		28,000		310,000	393,000	277,000	310,000	194,000
25									385,000	*278,000	301,000	192,000
26									379,000	281,000	296,000	189,000
27									373,000	284,000	*293,000	186,000
28									365,000	288,000	291,000	182,000
29					-				355,000	291,000	287,000	177,000
30					-------				343,000	292,000	283,000	174,000
31		-------			-------		-------		-------	296,000	281,000	-------
Total	‡6,117	‡2,610	‡1,424	‡1,577	‡1,189	928,000	‡1,020	‡5,890	‡13,539	‡9,198	‡10,197	‡6,903
Mean	197,300	87,000	45,940	50,870	42,460	29,940	34,000	190,000	451,300	296,700	328,900	230,100
Ac-ft	‡12,130	‡5,177	‡2,824	‡3,128	‡2,358	‡1,841	‡2,023	‡11,680	‡26,850	‡18,240	‡20,230	‡13,690

Calendar year 1957: Max 997,000 Min - Mean 212,700 Ac-ft 154,000,000
Water year 1957-58: Max 520,000 Min - Mean 166,000 Ac-ft 120,200,000

* Discharge measurement made on this day.
‡ Expressed in thousands.

Note.--No gage-height record Oct. 1 to June 16 (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 4 discharge measurements, gage-height record for station near Kaltag, weather records, and records for station at Ruby, Rampart, and Eagle.

7600. Chamberlin Creek near Barter Island

Location.--Lat 69°17'30", long 144°57'50", on right bank at terminal moraine, 800 ft downstream from Chamberlin Glacier, 1.6 miles upstream from Lake Peters, and about 65 miles southwest of Barter Island.

Drainage area.--1.46 sq mi.

Records available.--June to August 1958.

Gage.--Water-stage recorder. Altitude of gage is 5,000 ft (from topographic map).

Extremes.--Maximum discharge during period, 88 cfs July 5 (gage height, 2.93 ft); minimum daily, 0.3 cfs Aug. 31.

Remarks.--Records good. Considerable diurnal fluctuation caused by glacier melt at the source. Records given herein are computed as the mean discharge for a 24-hour period beginning at 6 a.m. on the indicated day and ending at 6 a.m. on the following day.

Discharge, in cubic feet per second, June to August, 1958

Day	June	July	Aug.	Day	June	July	Aug.	Day	June	July	Aug.	Day	June	July	Aug.
1	-	8.5	7.5	9	-	*22.9	10.5	17	-	*12.5	*7.8	25	-	*19.6	6.8
2	-	13.6	5.4	10	-	*23.5	*8.1	18	-	12.4	6.8	26	-	22.7	3.7
3	-	17.3	*7.5	11	-	*18.4	10.1	19	-	*20.3	5.1	27	-	21.8	3.0
4	-	*25.9	10.3	12	-	*17.9	12.2	20	-	25.3	8.2	28	-	*23.1	1.4
5	-	*37.4	*18.4	13	-	*22.4	*15.4	21	-	*18.4	8.2	29	*14.7	29.5	1.0
6	-	*32.7	*19.6	14	-	*18.9	13.9	22	-	*17.0	*5.8	30	*8.1	22.2	.5
7	-	*28.2	15.7	15	-	14.7	12.1	23	-	21.3	6.4	31	-	*10.7	.3
8	-	*22.6	*14.3	16	-	14.2	11.3	24	-	*19.2	6.3				
Total													-	635.1	263.6
Mean													-	20.5	8.50
Cubic feet per second per square mile													-	14.0	5.82
Runoff in inches													-	16.18	6.71
Runoff in acre-feet													-	1,260	523

* Discharge measurement made on this day.

7605. Neruokpukkoonga Creek near Barter Island

Location.--Lat 69°18'30", long 145°01'30", on east bank of Lake Peters, used to determine discharge at outlet of Lake Schrader (lat 69°22'00", long 144°54'00", about 60 miles southwest of Barter Island).

Drainage area.--123 sq mi.

Records available.--June to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 2,800 ft (from topographic map). Prior to July 29, 1958, staff gage at site a quarter of a mile south.

Extremes.--Maximum discharge observed during period, 706 cfs June 23 (gage height, 2.27 ft); minimum daily, 193 cfs Sept. 1.

Remarks.--Records good. Flow affected by natural storage in Lake Peters and Lake Schrader.

Rating table, June 23 to Sept. 1, 1958 (gage height, in feet, and discharge, in cubic feet per second)

1.2	190
1.5	301
1.9	489
2.3	725

Discharge, in cubic feet per second, June to September 1958

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	-	560	589	193	11	-	538	353	-	21	-	538	310	-
2	-	549	532	-	12	-	516	349	-	22	-	572	305	-
3	-	572	*474	-	13	-	500	358	-	23	699	583	305	-
4	-	566	428	-	14	-	494	367	-	24	693	572	301	-
5	-	583	409	-	15	-	505	353	-	25	687	583	*297	-
6	-	589	400	-	16	-	511	353	-	26	667	630	293	-
7	-	594	390	-	17	-	532	358	-	27	655	667	273	-
8	-	583	376	-	18	-	527	349	-	28	661	661	265	-
9	-	566	*362	-	19	-	505	335	-	29	*643	661	257	-
10	-	549	362	-	20	-	505	322	-	30	600	667	231	-
										31	-	643	210	-
Total											-	17,621	10,866	-
Mean											-	568	351	-
Cubic feet per second per square mile											-	4.62	2.85	-
Runoff in inches											-	5.33	3.29	-
Runoff in acre-feet											-	34,950	21,550	-

* Discharge measurement made on this day.

Measurements of streamflow in Alaska made at points other than regular gaging stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. Measurements believed to have been made under base-flow conditions are identified by an asterisk (*) to the left of the discharge figure. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of stream. The column headed, "Measured previously" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at points other than gaging stations during water year 1958

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
		Southeastern Alaska				
Delta (Ruth) Creek.	Thomas Bay...	Lat 56°48', long 132°47', at mouth, 13 miles northeast of Petersburg.	10.3	1947-53, 1955-57	Feb. 17	*6.57
Lemon Creek..	Gastineau Channel.	Lat 58°21'35", long 134°29'50", at highway bridge, 5 miles northwest of Juneau.	24.4	1951-57	Oct. 21	121
					Nov. 12	147
					Dec. 6	197
					Dec. 16	*50.5
					Dec. 27	*37.1
					Dec. 30	*31.8
					Jan. 3	91.5
					Jan. 10	66.3
					Jan. 14	56.0
					Jan. 17	99.7
					Jan. 21	*48.2
					Jan. 24	*46.2
					Jan. 28	*38.8
					Jan. 31	*29.6
					Feb. 4	*31.0
					Feb. 7	*17.8
					Feb. 11	*28.5
					Feb. 14	*26.0
					Feb. 18	*23.6
					Feb. 21	*24.4
					Feb. 25	*21.9
					Feb. 28	32.4
					Mar. 4	65.2
					Mar. 7	*24.6
					Mar. 10	*24.4
					Mar. 14	*14.3
					Mar. 17	*18.1
					Mar. 21	*21.6
					Mar. 25	*18.8
					Mar. 28	*19.4
					Mar. 31	*29.6
					Apr. 4	*32.0
					Apr. 8	*39.5
					Apr. 14	62.0
					Apr. 18	*41.9
					Apr. 21	*39.0
					Apr. 24	*34.3
					Apr. 29	106
					May 2	*90.1
					May 9	137
					May 15	188
					May 21	402
					May 27	216
					June 5	462
					June 11	432
					June 18	584
					June 25	482
					July 2	356
					July 8	342
					July 23	532
					July 30	1,430
					Aug. 6	813
					Aug. 14	615
					Aug. 25	547
					Aug. 27	356
					Sept. 3	237
					Sept.10	261
					Sept.17	198
					Sept.26	220
Fish Creek...	Fritz Cove...	Lat 58°19'50", long 134°35'20", on Douglas Island, at mouth, 7 miles northwest of Juneau.	13.6	1957	Oct. 23	*12.0
					Nov. 14	*36.3
					Dec. 9	*22.1
					Dec. 27	*12.4
					Dec. 30	*11.8
					Jan. 3	202
					Jan. 6	242
					Jan. 10	*54.6
					Jan. 14	*27.8
					Jan. 17	170
					Jan. 21	*36.2
					Jan. 24	*27.6
					Jan. 28	*17.1
					Jan. 31	*9.97
					Feb. 4	*10.9
					Feb. 7	*7.30
					Feb. 11	*10.6
					Feb. 14	*8.89
					Feb. 18	*8.91
					Feb. 21	*7.92

* Base flow.

Discharge measurements made at points other than gaging stations during water year 1958--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Southeastern Alaska--Continued						
Fish Creek...	Fritz Cove...	Lat 58°19'50", long 134°35'20", on Douglas Island, at mouth, 7 miles northwest of Juneau.	13.6	1957	Feb. 25	*14.2
					Feb. 28	71.9
					Mar. 4	124
					Mar. 7	*16.5
					Mar. 10	*11.4
					Mar. 14	*9.97
					Mar. 17	*9.12
					Mar. 21	*5.01
					Mar. 25	*7.14
					Mar. 28	*13.3
					Mar. 31	*12.6
					Apr. 4	*33.8
					Apr. 8	*44.5
					Apr. 14	69.2
					Apr. 18	*38.0
					Apr. 21	*28.8
					Apr. 24	*29.0
					Apr. 29	83.5
					May 2	*70.7
					May 7	199
					May 15	160
					May 21	209
					May 27	112
					June 3	*93.6
					June 11	*49.7
					June 18	67.4
					June 25	48.7
					July 2	*17.5
					July 8	*13.5
					July 16	*14.4
					July 23	54.9
					July 30	118
					Aug. 6	86.4
					Aug. 13	17.9
					Aug. 22	56.0
					Aug. 27	47.1
					Sept. 3	30.5
					Sept.10	32.6
					Sept.17	*23.9
					Sept.25	135
Alaska west of longitude 141°						
Gulkana River	Copper River.	Lat 62°16'10", long 145°22'50", at bridge on Richardson Highway, at Gulkana.	a1,980	1948-50, 1954,1957	Oct. 12	2,170
					Nov. 13	*719
					Dec. 29	*326
Quartz Creek.	Kenai River..	Lat 60°28'50", long 149°43'05", at old highway bridge about ¼ mile above mouth and about 4 miles east of Cooper Landing.	-	1947-50, 1957	Oct. 23	588
					Dec. 6	180
					Feb. 3	*83.2
					Apr. 28	211
Cooper Creek.	....do.....	Lat 60°27', long 149°51', 15 ft above Stetson Creek and 3 miles south of Cooper Landing.	-		Feb. 4	*31.4
					Apr. 30	56.8
North Fork Campbell Creek.	Campbell Creek.	Lat 61°10'20", long 149°42'30", in SW¼ sec.31, T.13 N., R.2 W., 5 miles above confluence with South Fork and 7 miles southeast of Anchorage Post Office.	-		June 24	31.6
Do.....	....do.....	Lat 61°10'10", long 149°45'40", in SW¼ sec.35, T.13 N., R.3 W., at bridge on gravel road, 2½ miles above confluence with South Fork and 5½ miles southeast of Anchorage Post Office.	-	1947-50, 1952, 1954-55	June 24	30.7
Do.....	....do.....	Lat 61°10'55", long 149°47'00", in NE¼ sec.34, T.13 N., R.3 W., 1½ miles above confluence with South Fork and 4½ miles southeast of Anchorage Post Office.	-		June 24	29.6
Do.....	....do.....	Lat 61°10'30", long 149°49'05", in NW¼ sec.33, T.13 N., R.3 W., 600 ft above confluence with South Fork and 4 miles southeast of Anchorage Post Office.	-		June 24	34.7
South Fork Campbell Creek.	....do.....	Lat 61°09'20", long 149°44'40", in SW¼ sec.1, T.12 N., R.3 W., 1 mile above bridge on gravel road, 3.2 miles above confluence with North Fork and 6½ miles southeast of Anchorage Post Office.	-		June 23	91.3
Campbell Creek.	Cook Inlet...	Lat 61°10'35", long 149°49'20", in NW¼ sec.33, T.13 N., R.3 W., 400 ft below confluence of North and South Forks, ¼ mile upstream from bridge on Lake Otis Rd., and 3½ miles southeast of Anchorage Post Office.	-		June 23	114
					June 24	110

* Base flow.
a Approximately.

Discharge measurements made at points other than gaging stations during water year 1958--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Alaska west of longitude 141°--Continued						
Campbell Creek.	Cook Inlet...	Lat 61°10'40", long 149°50'10", in NE¼ sec.32, T.13 N., R.3 W., at bridge on Lake Otis Rd., 3½ miles southeast of Anchorage Post Office.	-		Mar. 26	*17.0
Russian Jack Springs.	Chester Creek	Lat 61°12'25", long 149°46'55", in NE¼ sec.22, T.13 N., R.3 W., at Anchorage prison farm, 3½ miles east of Anchorage.	-	1948-49, 1952-58	Nov. 8 Dec. 10 Jan. 24 Feb. 26 Mar. 11 Apr. 1 Apr. 29 July 1 July 29 Aug. 13 Aug. 22 Sept.25	6.75 6.51 5.56 4.80 4.96 4.38 5.16 5.30 4.74 6.79 6.83 5.89
Ship Creek...	Cook Inlet...	Lat 61°14'20", long 149°46'35", on line between sec.10, 11, T.13 N., R.3 W., at bridge on Glenn (Davis) Highway, 4 miles northeast of Anchorage Post Office.	-		Mar. 26	5.10
Knik River...	....do.....	Lat 61°30'15", long 149°01'45", in SE¼ sec.2, T.16 N., R.2 E., at bridge on Glenn Highway, 7 miles south of Palmer.	a1,180	1948-58	July 15 July 16 July 17 July 21	25,900 90,100 177,000 47,000
Nuka River...	Nuka Bay.....	Lat 59°41', long 150°42', ½ mile downstream from Nuka Glacier and about 29 miles east of Homer.	-		Feb. 6	3.34
Fortymile River.	Yukon River..	Lat 64°18', long 141°24', at bridge on Taylor Highway, ½ mile below O'Brien Creek, and 4½ miles northwest of Steel Creek.	-	1954-57	Aug. 31	1,210
Nenana River.	Tanana River.	Lat 63°27'20", long 148°48'10", 100 ft upstream from bridge on Denali Highway, ¾ mile upstream from Jack River, 1 mile southeast of Windy railroad station, and 2 miles downstream from Schist Creek.	a710	1950-56‡	Oct. 2	1,150
Tanana River.	Yukon River..	Lat 64°09'20", long 145°51'00", on line between secs. 6 and 7, T.9 S., R.10 E., at bridge on Richardson Highway, 0.5 mile northwest of Big Delta, ½ mile upstream from Delta River, 8 miles downstream from Goodpaster River, and 75 miles southeast of Fairbanks.	a13,500	1948-52‡, 1953, 1954-56‡	Oct. 11	11,800
Melozitna River.	....do.....	Lat 64°45'40", long 155°29'00", 1¼ miles above mouth and 1½ miles northeast of Ruby.	-	1957	Jan. 20 Mar. 7 Apr. 7 June 18 July 26 Aug. 28 Sept.17 Sept.29	*53.3 **5 *88.6 3,440 6,760 3,000 2,310 2,360
Ogotoruk Creek.	Chukchi Sea..	Lat 68°06'40", long 165°45'10", on right bank 0.3 mile downstream from small tributary, 1.2 mile upstream from mouth, 6 miles east of Cape Thompson, and 32 miles southeast of Point Hope.	a35		Aug. 27 Sept.25	195 55.8

* Base flow.
‡ Operated as a continuous-record gaging station.
** Field estimate of base flow.
a Approximately.

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
1980. SLANA RIVER NEAR SLANA																		
Oct. 17, 1957		11	0.02	--	--	2.6	1.3	136	44	1.5	0.2	0.5	174	153	42	299	7.8	3
Nov. 20		--	--	46	14	3.8	1.7	161	43	1.0	--	--	--	172	40	339	8.0	0
Dec. 29		13	.05	44	16	4.5	2.1	160	52	1.5	.2	.4	213	176	44	341	7.6	0
May 5, 1958		8.3	.17	40	10	2.4	1.3	133	35	.0	.0	.4	164	141	32	278	7.8	0
June 3		5.4	.30	42	8.4	1.5	1.1	119	40	1.0	.1	.1	159	140	42	268	6.8	0
June 23		6.1	.07	40	11	2.3	1.1	112	49	2.0	.2	.0	167	145	53	276	7.0	0
Aug. 27		6.8	.06	42	12	2.2	1.0	118	62	1.5	.1	.2	186	154	58	312	7.6	0
1982. AHTELL CREEK NEAR SLANA																		
Oct. 17, 1957		12	0.02	27	4.3	2.0	0.9	81	23	0.5	0.2	0.4	110	85	18	179	7.6	3
Dec. 29		13	.02	35	4.9	2.9	1.2	100	30	2.0	.0	.9	139	108	26	224	7.2	0
Feb. 11, 1958		16	.02	36	6.0	3.0	.9	105	31	3.5	.0	.8	149	114	28	228	7.9	0
May 5		8.4	.14	23	3.1	1.4	1.0	64	18	.0	--	1.0	a104	70	18	141	7.2	60
June 3		7.1	.07	17	2.6	1.1	.7	46	15	1.0	.1	.3	68	53	16	108	6.8	5
June 23		9.8	.02	22	7.0	1.8	.6	75	21	2.5	.2	.0	102	84	22	168	7.0	0
Aug. 27		12	.05	26	6.8	2.0	.5	78	24	3.0	.2	.1	113	93	29	171	6.9	0
1984. INDIAN RIVER NEAR CHISTOCHINA																		
Oct. 17, 1957		16	0.04	20	4.4	2.2	1.0	80	6.0	0.5	0.0	0.2	89	68	2	135	7.3	7
Nov. 20		--	--	25	4.3	2.3	.8	96	1.5	1.0	--	--	--	80	2	164	--	0
Dec. 29		15	.02	28	4.1	2.7	1.2	105	8.0	1.0	.0	.5	112	87	1	182	7.2	5
Feb. 11, 1958		27	.04	48	10	6.6	2.0	188	18	2.0	.0	1.8	208	161	7	322	7.0	5
May 5		8.1	.14	14	2.5	1.1	.9	52	4.0	.0	.1	1.3	a75	45	2	92	6.9	90
June 3		8.3	.09	12	1.4	.8	.6	40	3.5	.5	.0	.3	47	36	3	76	6.4	10
June 23		13	.09	21	5.7	2.2	.9	85	8.0	2.5	.0	.0	95	76	6	146	7.1	0
Aug. 26		15	.04	18	5.4	1.8	.6	78	7.0	2.5	.0	.1	88	67	3	129	7.4	0
1986. CHISTOCHINA RIVER NEAR CHISTOCHINA																		
Oct. 17, 1957		11	0.02	32	9.4	2.6	1.3	111	34	1.0	0.0	0.2	146	118	28	240	7.7	3
Nov. 20		11	.02	42	7.2	3.4	1.5	130	35	1.0	.0	.2	165	134	28	271	7.6	7
Dec. 29		15	.05	54	23	6.2	2.6	220	57	3.0	.2	.3	269	229	49	434	7.8	0
May 5, 1958		6.1	.12	24	4.4	1.6	1.1	78	15	.5	.1	.7	a104	78	14	152	7.5	55
June 3		5.9	.28	32	5.5	1.4	1.1	80	39	1.0	.1	.1	125	102	37	210	7.1	0
June 23		5.6	.25	30	13	2.1	1.3	92	50	2.0	.2	.0	149	128	53	251	7.2	0
Aug. 26		8.8	.04	24	17	2.9	1.3	108	48	2.0	.1	.1	157	130	42	264	7.6	0

a Residue on evaporation at 180°C.

550195 O - 60 - 8

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
2002. GULKANA RIVER AT PAXSON																		
Oct. 19, 1957		7.6	0.02	14	2.5	3.9	1.5	57	4.5	2.0	0.0	0.5	64	46	0	102	7.3	0
Nov. 24		11	.05	13	3.1	2.2	1.0	52	1.5	3.0	.1	.0	61	45	2	85	7.1	5
Feb. 13, 1958		8.9	.02	14	1.6	2.0	.7	59	.5	.5	.0	.0	57	42	0	100	7.6	5
June 5		7.1	.05	14	3.5	1.8	.5	45	2.0	9.5	--	.1	61	50	12	112	6.0	5
June 25		7.0	.07	12	3.3	1.8	.5	52	2.0	3.0	.0	.1	56	44	1	91	6.8	0
Aug. 29		8.1	.07	12	5.2	2.2	.5	56	5.0	2.5	.0	.1	64	51	6	98	7.2	0
2004. GULKANA RIVER AT GULKANA																		
Oct. 17, 1957		8.9	0.04	17	4.1	5.0	1.2	72	4.0	5.5	0.0	0.8	85	60	0	137	6.6	30
Dec. 28		13	.08	29	8.5	11	4.0	131	5.0	17	.2	.3	152	107	0	260	7.2	20
Feb. 14, 1958		12	.06	27	6.6	8.6	1.3	111	5.0	14	.0	.1	130	94	4	228	7.8	15
May 8		6.0	.23	14	3.3	2.7	1.2	52	5.2	4.5	.1	.7	77	48	6	103	6.6	70
June 5		6.9	.03	12	3.3	4.1	.9	48	4.0	6.5	.0	.6	62	44	4	105	6.2	20
June 25		8.1	.05	19	5.7	6.6	1.4	78	4.0	12	.0	.1	95	71	7	163	7.1	20
Aug. 29		7.1	.05	20	7.0	7.1	.9	87	5.0	13	.0	.2	103	79	8	174	7.5	20
2018. LITTLE NELCHINA RIVER NEAR EUREKA																		
Oct. 19, 1957		11	0.02	46	7.6	12	0.9	128	59	1.5	0.2	0.6	202	146	41	324	7.8	3
Nov. 24		12	.02	49	6.8	11	.8	150	48	1.0	.0	.2	203	150	27	328	8.0	0
Jan. 6, 1958		9.4	.04	47	6.5	9.8	.9	153	36	1.5	.0	.7	187	144	18	310	7.8	0
Feb. 14		9.1	.02	47	6.3	8.9	.9	164	28	2.0	.1	1.1	184	143	8	311	7.3	0
May 8		5.2	.16	17	3.1	4.5	.9	54	18	.5	.2	.8	77	55	11	122	7.0	140
June 5		8.6	.14	28	3.4	6.6	.5	74	32	1.5	.3	.4	117	84	24	195	6.8	10
June 25		8.0	.04	27	14	9.7	.6	113	51	.5	.3	.2	167	125	32	281	7.8	5
Aug. 29		9.8	.05	40	13	12	.7	116	80	3.0	.1	.3	216	154	58	338	7.8	0
2381. RESURRECTION RIVER NEAR SEWARD																		
Oct. 3, 1957		3.8	0.03	21	2.6	2.0	0.7	59	13	2.5	0.1	0.6	75	63	14	131	6.6	5
Nov. 6		8.1	.04	20	1.3	2.0	.3	59	10	1.5	.0	1.2	73	56	7	121	7.4	5
Dec. 11		4.5	.03	26	1.8	2.6	.7	76	14	2.5	.0	.8	90	72	10	152	7.4	0
Jan. 22, 1958		5.8	.19	25	2.1	2.5	.4	74	12	4.0	.0	.6	88	71	10	150	7.5	0
Feb. 18		5.6	.03	22	3.5	2.4	.4	70	11	3.5	.0	1.1	84	70	12	148	7.0	5
May 21		4.7	.07	22	2.5	2.9	.4	65	14	4.0	.0	.8	83	65	12	129	7.3	0
July 16		4.0	.05	17	1.2	1.4	.5	46	10	3.0	.0	.2	60	48	10	102	6.6	10
Aug. 29		3.3	.05	14	2.8	1.4	.9	46	9.0	2.5	.2	.2	--	46	9	95	6.9	30

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfa)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
2390. BRADLEY RIVER NEAR HOMER																		
July 10, 1958.....	1,090	3.0	0.54	8.7	3.3	0.9	1.1	32	8.0	2.0	0.0	0.4	--	35	9	62	6.3	60
2415. DEEP CREEK NEAR NINILCHIK																		
Oct. 4, 1957		26	0.17	6.4	4.3	4.9	1.5	44	2.0	5.0	0.1	0.4	73	33	0	78	6.5	20
Nov. 6		22	.29	4.8	2.1	3.4	.8	30	1.7	1.5	.1	.8	52	20	0	58	7.2	30
Dec. 12.....		26	.10	4.0	2.0	5.4	1.5	37	--	1.5	--	.3	59	18	0	72	6.7	20
Feb. 20, 1958.....		31	.40	6.4	4.7	5.5	1.3	50	2.0	2.5	.0	.4	79	36	0	86	7.0	5
May 20		14	.22	2.4	2.1	2.3	.5	20	.0	2.0	.1	.3	34	14	0	36	6.4	20
July 15		30	.27	6.4	5.2	4.7	1.4	50	1.0	3.5	.2	.2	78	38	0	85	6.8	0
Aug. 21.....		25	.58	6.4	3.3	3.5	1.5	41	1.0	2.0	.1	.3	64	30	0	76	6.5	25
2417. NINILCHIK RIVER NEAR NINILCHIK																		
Oct. 4, 1957.....		27	0.31	6.4	4.3	7.2	1.5	46	6.0	3.0	0.2	0.5	79	33	0	84	6.9	40
Nov. 7		--	--	4.8	2.1	5.6	.8	34	1.0	2.0	.1	.4	--	20	0	61	7.2	50
Dec. 12		32	.12	5.9	3.6	8.0	1.5	50	.0	4.0	.2	.4	81	29	0	88	6.8	20
Jan. 23, 1958		34	.35	9.5	5.5	9.3	2.3	72	3.0	4.5	.1	.6	104	46	0	124	7.6	20
Feb. 20		37	.45	8.3	6.0	9.8	2.0	69	4.0	4.0	.0	1.1	107	45	0	122	6.4	20
May 20		22	.36	4.8	2.8	6.1	1.4	40	1.0	3.0	.1	.4	62	23	0	67	7.0	30
July 15		32	.46	7.9	6.2	8.3	1.9	67	3.0	3.0	.2	.5	96	45	0	110	6.8	40
Aug. 21.....		29	.78	8.7	3.3	5.8	1.6	56	1.5	2.0	.1	.6	81	35	0	97	6.6	50
2439. SNOW RIVER NEAR LAWING																		
Oct. 3, 1957.....		3.3	0.04	12	0.7	0.8	1.0	33	9.5	1.0	0.0	0.1	44	33	6	77	7.2	5
Nov. 6		4.4	.06	9.9	.7	1.3	1.0	29	7.0	1.0	.0	1.0	40	28	4	64	6.8	5
Dec. 11.....		6.6	.13	12	.4	1.4	1.1	34	6.0	1.5	.0	.4	46	32	4	76	6.8	10
Jan. 22, 1958		5.8	1.3	11	1.5	1.3	1.1	36	7.0	1.5	.0	.4	48	33	4	77	7.3	10
Feb. 19.....		7.6	.16	10	2.1	1.7	1.9	32	9.0	2.5	.0	.7	52	34	8	80	7.3	10
May 21		4.8	.04	10	1.4	.5	.7	27	6.0	2.5	.0	1.2	40	31	9	64	6.3	5
July 16		2.7	.07	6.0	1.4	.5	1.3	18	6.0	2.0	.2	.2	29	21	6	42	6.0	30
Aug. 20.....		2.5	.09	6.0	1.2	1.5	2.0	20	6.0	2.5	.2	.2	32	20	4	50	6.5	30
2550. QUARTZ CREEK NEAR COOPER LANDING																		
Oct. 3, 1957.....		5.3	0.05	12	1.8	2.1	0.7	39	7.0	0.5	0.1	0.6	49	37	6	76	7.0	0
Nov. 6.....		6.3	.02	11	2.2	1.8	.5	38	8.4	.5	.1	1.4	51	36	6	81	6.9	7
Dec. 11.....		6.7	.02	13	1.5	1.9	.3	41	6.0	1.5	.0	1.6	52	38	5	89	7.2	0

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
2550. QUARTZ CREEK NEAR COOPER LANDING--Continued																		
Jan. 22, 1958		6.6	0.02	14	1.3	2.2	0.4	44	7.0	2.5	0.0	1.1	57	40	4	94	7.1	0
Feb. 19		7.1	.02	15	2.9	2.4	.3	48	8.0	4.0	.0	1.2	65	50	10	104	7.0	5
May 20		5.9	.07	13	2.0	2.4	.1	38	8.0	2.0	.0	3.1	56	40	10	89	7.1	0
July 15		5.2	.07	11	2.7	1.8	.2	40	7.0	2.0	.1	.5	50	38	6	84	6.7	0
Aug. 21		4.8	.07	12	.9	1.5	.2	38	6.0	1.0	.1	.0	46	34	2	80	7.0	0
SWANSON RIVER NEAR KENAI																		
Oct. 4, 1957		16	0.02	16	3.7	5.5	1.1	77	1.5	2.0	0.2	0.0	84	55	0	130	7.5	40
Nov. 1		16	.23	15	4.8	6.0	1.4	77	3.0	2.5	.3	.6	88	57	0	130	7.5	30
Feb. 20, 1958		21	1.0	27	6.2	8.8	2.6	128	3.3	4.0	.2	.5	137	93	0	223	7.3	10
2662. MOOSE RIVER NEAR SOLDOTNA																		
Oct. 3, 1957		15	0.05	18	5.4	4.9	1.3	84	2.5	3.0	0.1	0.4	92	67	0	138	6.8	20
Nov. 6		18	.18	17	3.6	4.3	.8	78	.0	1.0	.1	.5	83	58	0	126	7.6	20
Dec. 11		16	.10	23	4.3	6.1	1.5	97	2.5	3.5	.2	.2	105	75	0	155	7.0	20
Jan. 23, 1958		17	1.0	23	5.9	6.0	1.8	114	2.0	3.0	.0	1.0	116	81	0	179	7.6	10
Feb. 19		18	.59	28	5.3	5.7	1.9	125	1.0	2.5	.1	1.0	126	92	0	201	6.8	25
May 20		9.9	.14	15	3.4	4.1	.8	68	1.0	2.0	.1	.3	70	51	0	105	7.2	10
July 15		12	.20	21	5.7	4.5	.8	101	.0	1.5	.0	.2	96	76	0	157	7.4	30
Aug. 21		13	.21	25	5.0	4.5	1.0	106	.0	.5	.2	.4	101	80	0	167	7.0	30
2663. KENAI RIVER AT SOLDOTNA																		
Oct. 3, 1957		4.2	0.05	8.7	2.2	1.3	1.1	32	6.0	0.5	0.0	0.2	40	30	4	68	6.8	10
Nov. 6		7.4	.41	9.1	1.0	1.4	1.0	31	4.0	1.0	.0	.7	41	26	1	65	7.2	20
Dec. 11		4.7	.10	8.7	1.2	1.6	1.3	32	5.0	.5	.0	.7	40	26	0	66	6.8	10
Jan. 23, 1958		4.9	.09	10	1.1	1.4	1.2	34	6.0	.5	.0	.8	43	30	2	70	7.1	15
Feb. 19		6.1	.16	9.9	2.4	2.3	1.0	39	6.0	1.5	.0	.8	49	34	2	81	6.1	0
May 20		5.2	.05	9.1	1.4	1.9	.9	15	5.0	2.0	.0	.2	41	28	3	68	6.5	0
July 15		4.0	.14	8.3	2.4	1.2	1.3	28	7.0	2.5	.1	.5	41	30	8	63	6.7	20
Aug. 21		3.6	.04	9.5	.5	.8	1.0	26	5.0	1.0	.0	.6	35	26	4	62	6.5	5
2680. RESURRECTION CREEK AT HOPE																		
May 21, 1958		9.3	0.02	13	3.1	2.8	0.2	47	5.0	4.0	0.0	1.3	62	45	6	92	6.5	0
July 14		6.5	.03	12	3.0	2.2	.2	41	8.0	3.5	.2	.1	56	42	9	89	6.1	0
Aug. 22		5.7	.03	15	1.9	2.6	.3	48	7.0	3.0	.1	.3	60	46	6	103	7.0	0

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
2710. GRANITE CREEK NEAR SUNRISE																		
Oct. 4, 1957		5.0	0.02	15	1.0	1.7	1.2	39	12	1.0	0.0	0.2	56	42	10	96	6.7	5
Nov. 5		6.9	.05	12	2.3	1.6	1.0	38	10	1.0	.1	1.1	55	40	8	86	7.0	5
Dec. 12		5.5	.05	15	1.5	2.5	1.0	46	10	2.5	.1	1.3	62	43	6	102	6.9	0
Feb. 18, 1958		6.4	.02	15	1.7	2.0	.5	44	8.0	2.0	.2	2.0	60	44	8	103	6.8	0
May 21		5.5	.04	11	1.7	1.2	1.0	35	5.0	2.0	.2	1.6	46	34	6	75	6.6	0
July 16		3.4	.09	7.5	1.4	1.2	1.0	24	6.0	1.5	.2	.1	34	24	5	54	6.3	10
Aug. 20		4.3	.05	12	.9	.9	.9	34	8.0	.5	.1	.1	45	33	6	82	7.0	5
2705. CANYON CREEK NEAR SUNRISE																		
Oct. 2, 1957		4.7	0.19	12	2.1	3.7	0.5	33	10	4.0	0.0	0.5	54	38	12	88	7.1	20
Nov. 5		7.3	.02	12	1.1	1.8	.3	36	7.0	1.0	.0	.9	49	34	6	80	7.3	0
Dec. 12		5.9	.03	13	1.5	2.1	.2	43	6.0	1.5	.0	1.1	52	38	4	90	7.1	5
Jan. 21, 1958		5.8	.02	15	1.0	2.4	.6	43	8.3	2.0	.0	1.0	57	42	6	99	7.0	0
Feb. 18		6.3	.02	15	1.7	2.8	.2	44	8.0	3.0	.0	2.3	61	44	8	104	6.9	0
May 21		6.2	.02	12	1.4	1.3	.4	29	5.0	5.5	.1	2.8	49	36	12	79	5.9	20
July 16		4.2	.03	9.9	1.7	1.0	.1	26	8.0	2.0	.3	.1	40	32	10	64	6.1	0
Aug. 20		3.9	.03	11	2.2	1.2	.1	34	9.0	1.0	.2	.1	46	36	8	77	6.5	0
2720. SIX MILE CREEK NEAR SUNRISE																		
Oct. 2, 1957		4.7	0.06	13	1.7	1.4	0.7	40	9.5	1.5	0.0	0.3	53	40	6	91	7.1	5
Nov. 5		7.7	.02	13	2.0	1.6	.4	40	9.0	.5	.2	1.1	56	40	8	90	7.4	3
Jan. 21, 1958		6.4	.02	15	1.9	2.1	.6	47	9.0	2.5	.0	1.2	62	45	7	101	7.2	5
Feb. 18		9.7	.02	17	1.7	2.5	.3	59	5.0	1.0	.0	2.4	69	50	1	113	7.0	0
May 21		5.7	.02	12	1.1	1.2	.5	33	6.0	1.5	.1	2.5	47	34	8	75	6.6	5
July 14		4.4	.05	9.5	1.9	.6	.4	27	8.0	2.5	.2	.2	41	32	10	69	6.3	0
Aug. 22		4.2	.05	11	1.0	1.0	.7	32	9.0	.5	.1	.2	44	32	6	75	6.9	0
2721. INGRAM CREEK NEAR PORTAGE																		
Oct. 2, 1957		4.7	0.02	14	1.3	1.1	0.7	40	8.6	2.0	0.1	0.4	52	40	8	97	7.5	10
Nov. 5		4.6	.02	10	1.4	1.0	.5	32	6.4	1.0	.0	.9	42	31	5	71	7.3	5
Dec. 10		4.8	.02	13	1.7	1.2	.7	39	8.0	.0	.1	1.1	50	40	8	84	7.0	0
Jan. 21, 1958		4.5	.02	12	.6	1.2	.7	34	5.0	1.0	.0	.9	43	32	4	74	7.1	5
Feb. 18		5.8	.02	15	2.4	2.4	.7	50	8.0	3.0	.1	1.7	64	48	6	106	7.6	5
May 21		4.2	.04	8.3	1.9	.8	.4	27	6.0	1.5	.1	.7	37	28	6	54	7.0	0
July 16		3.5	.03	6.7	1.7	.6	.9	21	6.0	1.5	.2	.4	32	24	6	48	6.1	20
Aug. 20		3.9	.05	10	2.3	.8	.6	33	6.0	2.0	.2	.2	42	34	8	74	6.7	0

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
2722. PLACER RIVER NEAR PORTAGE																		
Oct. 4, 1957		2.4	0.02	15	0.5	0.8	0.3	37	8.5	2.5	0.0	0.2	48	40	9	90	7.3	--
Nov. 5		3.9	.14	12	2.3	2.9	1.4	35	10	6.0	.1	.7	56	40	11	82	6.9	20
Dec. 10		4.1	.02	12	3.7	3.5	.5	50	8.0	2.0	.1	.4	59	45	4	109	7.1	0
Jan. 21, 1958		3.9	.22	13	1.2	3.0	.7	44	4.0	4.0	.0	.4	52	38	2	94	7.0	10
Feb. 18		5.6	.02	20	3.0	6.0	.9	68	11	7.5	.2	.8	88	62	7	146	6.7	5
May 21		4.4	.09	12	.2	2.8	.8	30	5.8	4.0	.0	1.4	46	31	6	79	6.5	10
July 16		2.1	.09	6.0	.9	.4	.6	18	4.0	1.5	.0	.2	25	18	4	41	6.2	30
Aug. 20		1.8	.03	6.0	1.4	.6	.6	18	7.0	1.0	.2	.2	28	21	6	48	6.4	20
2723. PORTAGE CREEK AT PORTAGE																		
Oct. 4, 1957		1.7	0.02	9.5	0.2	1.0	0.4	26	4.0	1.5	0.0	0.1	31	24	3	57	7.3	15
Nov. 5		3.2	.14	7.9	2.4	1.7	.7	26	5.0	5.0	.0	.3	39	30	8	54	6.8	20
Dec. 10		2.9	.11	11	.5	1.5	.5	35	1.4	2.5	.0	.1	38	30	1	72	7.0	15
Jan. 21, 1958		2.0	.04	9.9	.7	1.2	.6	32	3.0	2.0	.0	.2	36	28	2	63	7.0	10
May 21		1.9	.02	9.9	.2	.9	.6	25	15	2.0	.0	.1	33	26	5	63	6.2	7
July 16		1.4	.05	6.4	.9	.4	.4	18	4.0	2.0	.0	.2	25	20	4	43	6.2	10
Aug. 20		1.2	.05	6.7	1.2	.4	.6	18	5.0	2.5	.2	.2	27	22	6	40	6.4	20
2724. TWENTY MILE RIVER NEAR PORTAGE																		
Oct. 2, 1957		2.1	0.02	10	0.0	1.2	0.3	29	4.0	1.5	0.0	0.2	33	25	1	61	7.1	15
Nov. 5		4.5	.14	12	2.6	1.3	.3	43	7.2	1.0	.0	.7	51	40	6	87	7.5	15
Dec. 10		4.4	.02	23	.9	8.4	1.0	69	11	10	.0	1.3	94	61	4	164	7.2	5
Jan. 21, 1958		3.2	.14	15	2.2	3.6	.7	53	6.0	4.0	.0	.6	61	46	3	114	7.3	7
Feb. 18		5.4	2.2	25	2.6	7.8	1.0	84	10	9.0	.1	.7	105	73	4	190	6.7	20
May 21		3.0	.05	16	1.3	1.8	.4	48	7.0	2.0	.0	1.2	57	46	6	101	6.9	5
July 16		1.6	.07	8.3	.7	.6	.5	26	.0	2.5	.0	.2	27	24	2	55	6.5	20
Aug. 20		1.7	.03	8.3	2.4	.8	.6	29	8.0	.5	.2	.2	37	30	6	64	6.4	20
2726. BIRD CREEK NEAR ANCHORAGE																		
Oct. 2, 1957		4.5	0.04	15	2.9	1.8	0.6	45	12	1.0	0.0	0.9	61	50	12	103	7.4	5
Nov. 5		2.0	.10	15	2.4	2.4	.4	49	9.0	1.5	.1	1.1	58	48	8	109	7.4	5
Feb. 18, 1958		6.3	.02	20	5.4	12	1.0	63	17	18	.1	1.6	112	72	20	188	6.7	20
May 21		5.2	.03	15	1.5	1.3	.3	42	9.0	1.0	.0	3.6	58	44	9	94	7.1	0
July 16		3.1	.07	9.5	2.9	1.0	.4	30	8.0	2.5	.0	.6	43	36	11	69	6.3	20
Aug. 20		3.6	.03	13	3.1	1.2	.2	41	10	2.0	.2	.6	51	45	12	92	6.7	0

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
2740. SOUTH FORK CAMPBELL CREEK NEAR ANCHORAGE																		
Jan. 24, 1958	--	8.0	0.02	13	3.4	1.2	0.2	42	14	1.0	0.0	0.2	62	46	12	96	7.0	0
Mar. 11	10.2	8.3	.02	14	2.3	1.2	.2	41	12	.5	.0	1.1	60	44	11	98	7.3	0
Apr. 18	10.7	8.1	.02	13	3.4	1.3	.3	46	10	1.5	.0	.4	64	46	9	99	7.2	0
May 13	25.0	7.4	.02	12	3.0	1.3	.4	38	11	1.5	.1	1.4	57	42	12	94	6.9	5
July 29	27.0	6.0	.07	11	2.7	.9	.1	38	14	2.5	.0	.1	51	38	16	81	6.7	0
2742. NORTH FORK CAMPBELL CREEK NEAR ANCHORAGE																		
Jan. 24, 1958		9.1	0.02	21	4.1	1.7	0.5	62	21	1.0	0.0	0.2	89	70	18	147	7.2	0
Mar. 11		9.3	.07	23	3.3	1.5	.4	64	19	.5	.1	1.9	91	71	18	151	7.3	7
Apr. 18		8.9	.02	19	5.5	1.6	.3	65	18	2.0	.0	.4	88	70	17	138	7.4	0
May 13		8.9	.14	19	4.3	1.9	.9	60	17	1.0	.1	2.8	86	65	16	137	7.0	10
July 29		6.7	.10	17	3.8	1.3	.1	45	19	3.0	.1	.2	73	58	21	120	6.7	5
2745. CAMPBELL CREEK NEAR ANCHORAGE																		
Oct. 2, 1957		7.3	0.04	13	3.1	2.2	0.4	36	21	1.5	0.0	0.5	67	45	15	104	7.3	10
Nov. 5		10	.04	15	2.4	1.6	.3	42	16	1.0	.0	1.2	68	48	13	111	7.3	0
Dec. 10		8.3	.05	15	2.2	1.5	.5	40	16	.5	.0	1.2	65	46	14	106	7.3	7
Jan. 24, 1958		8.6	.02	16	2.3	1.6	.5	46	15	.0	.0	1.1	68	49	12	110	7.1	5
Feb. 21		9.0	.06	16	3.0	2.4	.8	45	15	3.0	.0	1.4	73	52	16	119	6.9	5
2750. CHESTER CREEK AT ANCHORAGE																		
Jan. 24, 1958	--	12	0.06	24	7.2	3.0	0.6	94	12	3.0	0.1	1.5	109	90	12	180	7.5	10
Mar. 11	--	13	.02	24	5.6	2.8	.7	92	11	2.5	.1	2.1	107	83	8	179	7.3	7
Apr. 18	20.2	11	.02	21	6.0	2.4	.8	87	10	3.0	.0	.6	98	77	6	161	7.4	0
May 13	18.4	11	.38	20	7.3	2.6	1.0	82	12	2.0	.1	1.4	98	80	13	155	7.1	60
July 29	33.8	13	.25	19	6.9	2.7	.4	73	13	3.5	.1	.4	95	76	16	146	6.8	50
2761. SHIP CREEK AT BRIDGE ON GLENN HIGHWAY, NEAR ANCHORAGE																		
Jan. 24, 1958		8.0	0.02	21	4.1	2.3	0.5	65	19	2.0	0.1	0.3	89	70	16	152	7.4	0
Mar. 11		7.7	.17	21	3.6	2.0	.4	63	18	1.0	.1	1.0	86	68	16	145	7.4	0
Apr. 28		8.4	.02	19	5.3	2.2	.3	70	16	1.5	.0	.5	87	70	12	144	7.4	0
May 13		6.8	.02	17	3.4	2.0	.2	54	16	1.0	.1	1.1	74	56	12	124	7.2	5
July 29		5.7	.05	18	3.7	2.0	.2	49	21	2.5	.0	.2	77	60	20	130	6.9	0

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
2765. EAGLE RIVER NEAR ANCHORAGE																		
Oct. 2, 1957		3.2	0.04	24	5.1	1.9	0.4	67	28	0.5	0.0	0.3	96	81	26	166	7.6	5
Nov. 5		7.2	.02	28	4.8	2.9	.5	84	24	1.0	.0	1.2	111	90	20	192	7.6	5
Dec. 10		9.0	.02	26	6.3	3.2	.5	97	17	2.0	.1	1.7	114	91	11	187	7.4	0
May 21, 1958		4.4	.02	31	5.7	2.6	.4	94	26	1.0	.1	2.9	120	101	24	207	7.3	0
July 16		2.3	.10	13	2.9	.9	.6	38	13	1.5	.0	.2	54	44	14	91	6.4	20
Aug. 12		2.0	.02	9.9	2.4	.8	1.2	32	10	3.0	.0	.2	46	34	8	76	6.5	30
2810. KNIK RIVER NEAR PALMER																		
Oct. 2, 1957		4.3	0.04	33	5.2	3.9	0.7	91	29	3.5	0.0	0.1	125	104	30	223	7.6	5
Nov. 5		3.4	.05	20	2.8	2.0	.8	57	17	1.0	.1	.6	76	62	15	131	7.5	5
Dec. 10		4.4	.02	26	3.4	4.3	.8	79	21	2.0	.0	.7	102	80	16	175	7.2	0
Jan. 24, 1958		5.5	.02	34	7.4	3.2	.7	114	29	2.0	.0	.6	138	116	22	236	7.9	0
Feb. 21		4.9	.02	31	3.0	2.0	.5	78	23	.0	.1	2.8	105	90	26	199	7.4	0
May 21		5.0	.03	39	4.4	3.7	.7	103	37	3.5	.1	.7	145	116	31	238	7.2	0
July 16		2.2	.08	15	1.9	.7	.8	42	10	2.0	.0	.2	54	46	11	93	7.0	10
Aug. 12		1.9	.03	11	1.7	.7	1.4	36	8.0	2.0	.0	.1	45	34	5	76	6.9	30
2830. KINGS RIVER NEAR SUTTON																		
Oct. 19, 1957		8.3	0.02	24	2.5	3.0	0.3	59	24	2.0	0.1	1.0	94	70	22	155	7.5	0
June 5, 1958		4.2	.07	16	1.8	1.2	.2	38	16	1.5	.0	.1	60	48	16	100	6.0	0
June 26		5.0	.02	20	1.3	1.9	.3	42	24	1.0	.1	.3	75	56	21	122	7.2	5
Aug. 29		7.9	.08	22	3.0	2.5	.4	51	26	3.5	.0	.3	91	68	26	144	7.4	10
CLEARWATER CREEK NEAR PAXSON																		
June 12, 1958		6.0	0.02	14	4.2	1.3	0.8	50	11	2.0	0.1	0.1	64	52	11	101	6.8	0
July 21		6.2	.02	19	3.4	1.4	.7	60	14	.5	.1	.0	75	62	12	132	6.8	0
Sept. 24		12	.02	7.1	2.6	1.8	.5	31	2.0	2.5	.2	.1	44	28	2	62	6.3	5
CHULITNA RIVER NEAR TALKEETNA																		
Apr. 3, 1958		5.9	0.02	26	4.6	2.7	1.8	78	22	2.0	0.2	0.8	104	84	20	180	7.4	5

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
3000. NEWHALEN RIVER NEAR ILIAMNA																		
May 26, 1958		5.4	0.02	6.5	0.9	1.2	0.7	21	3.5	1.0	0.1	0.4	30	20	2	51	6.9	5
3030. WOOD RIVER AT ALEKNAGIK																		
Apr. 9, 1958		4.0	0.02	4.8	1.4	1.1	0.2	16	4.0	2.5	0.0	0.2	26	18	5	44	6.4	0
4735. LITTLE TOK RIVER NEAR TOK JUNCTION																		
Oct. 17, 1957		12	0.02	55	12	3.7	1.4	182	45	1.0	0.2	0.7	221	186	38	360	7.6	3
Nov. 20		8.1	.02	36	12	5.0	2.1	118	45	3.5	.1	.9	171	139	43	280	7.4	0
Dec. 29		18	.05	52	22	6.0	2.1	211	64	1.5	.2	.6	270	220	47	429	7.9	5
Feb. 11, 1958		16	.02	61	14	4.6	2.0	212	49	2.0	.0	.8	253	210	36	404	7.6	0
May 5		7.7	.13	36	7.7	2.0	1.3	118	27	.0	.2	.9	a156	122	25	234	7.3	50
June 3		6.8	.22	42	8.4	2.0	1.0	126	37	.5	.1	.4	160	140	36	277	6.9	5
June 23		7.8	.02	41	13	3.7	1.0	141	41	2.0	.2	.2	179	156	40	297	7.2	0
Aug. 27		10	.02	--	--	3.2	1.0	150	46	2.5	.2	.5	--	171	48	316	7.7	0
4739. TOK RIVER AT BRIDGE ON GLEN HIGHWAY NEAR TOK JUNCTION																		
Oct. 17, 1957		10	0.02	46	19	3.2	1.7	168	54	2.0	0.1	1.0	220	193	56	371	7.8	0
Nov. 20		15	.02	60	21	5.0	2.3	226	52	1.0	.0	1.4	289	236	51	438	7.8	0
May 5, 1958		7.2	.08	37	7.1	1.9	1.2	115	29	.0	.2	.4	a154	122	28	234	7.4	40
June 3		5.6	.14	36	11	1.0	1.0	106	44	.5	.1	.8	152	135	48	280	7.2	0
June 23		7.4	.02	46	17	2.2	1.2	151	59	1.5	.1	.4	209	185	62	346	7.3	0
Aug. 27		9.6	.04	61	8.8	2.5	1.3	158	64	3.0	.1	.6	229	188	58	359	7.8	0
4740. TOK RIVER NEAR TOK JUNCTION																		
Feb. 11, 1958		30	0.02	111	32	8.3	3.6	416	89	1.5	0.1	3.2	484	408	68	751	7.6	5
May 6		7.4	.08	35	9.0	1.6	1.3	113	32	.0	.1	.7	a160	124	32	241	7.4	35
June 4		5.4	.14	38	8.6	1.2	1.3	109	39	.5	.1	1.1	149	130	41	259	7.2	0
June 24		7.0	.25	50	16	1.8	1.1	152	61	1.5	.2	.5	208	190	66	353	7.6	0
Aug. 27		8.2	.09	52	15	2.2	1.3	153	70	1.0	.2	.6	226	191	66	372	7.9	0

a Residue on evaporation at 180°C.

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
4761. ROBERTSON RIVER NEAR TANACROSS																		
Oct. 18, 1957		4.3	0.02	52	14	2.9	2.0	124	87	2.5	0.1	0.6	226	187	86	375	7.7	0
Nov. 21		5.5	.02	49	19	3.1	3.2	142	94	1.5	.1	1.0	246	200	84	397	7.7	0
Dec. 31		6.3	.02	77	27	3.5	3.2	217	131	1.5	.0	1.4	358	303	125	578	8.2	0
May 6, 1958		3.4	.03	41	13	1.3	1.5	114	60	.0	.1	.2	176	156	62	304	7.8	15
June 4		4.0	.39	40	12	1.1	1.6	97	65	1.0	.0	.2	173	150	70	293	7.4	0
June 24		3.2	.34	36	15	1.3	1.7	94	68	1.5	.2	.2	173	152	74	295	7.3	0
Aug. 27		4.0	.04	45	15	1.9	1.7	104	82	2.5	.1	.1	203	174	88	331	7.8	0
4765. JOHNSON RIVER NEAR DOT LAKE																		
Oct. 18, 1957		4.9	0.02	43	12	3.3	3.6	113	74	2.0	0.1	0.4	199	157	64	337	7.7	0
Nov. 21		4.5	.02	40	16	3.4	3.9	119	73	1.0	.2	.2	202	166	68	333	7.4	0
Dec. 31		3.8	.02	46	12	2.2	3.1	117	72	1.0	.0	.7	199	164	68	337	7.6	5
May 6, 1958		3.1	.05	33	8.8	1.3	2.0	86	48	.0	.2	.2	139	118	48	246	7.7	10
June 4		4.0	.56	40	6.5	1.2	2.8	98	48	.5	.1	.2	152	126	46	264	7.3	0
June 24		3.2	.20	34	11	1.7	2.5	86	60	2.0	.2	.4	157	130	60	266	7.5	0
Aug. 27		3.6	.04	30	15	1.7	2.5	87	69	3.0	.1	.0	168	136	66	280	7.7	5
4766. LITTLE GERSTLE RIVER NEAR BIG DELTA																		
Oct. 18, 1957		7.0	0.02	--	--	1.9	2.7	159	48	1.5	0.3	1.3	198	180	50	345	7.5	3
May 6, 1958		3.8	.31	26	7.2	.8	1.8	86	26	.0	.2	1.0	a129	94	24	189	7.5	60
June 4		3.9	.16	28	6.0	.9	1.8	80	30	1.0	.1	.7	112	94	29	199	7.1	0
June 24		3.8	.36	36	9.8	1.6	2.5	102	48	2.0	.4	.4	155	130	46	257	7.5	0
Aug. 27		4.7	.07	44	12	1.8	2.6	118	67	1.0	.3	.7	192	160	63	324	7.7	0
4767. GERSTLE RIVER NEAR BIG DELTA																		
May 6, 1958		3.6	0.04	38	11	2.4	2.0	98	60	0.5	0.6	0.6	167	140	50	243	7.7	20
June 4		3.9	.24	30	6.3	1.8	2.2	80	36	1.5	.6	.3	122	101	36	213	7.3	0
June 24		3.1	.09	30	8.2	2.0	2.2	79	45	1.5	.6	.1	132	108	44	226	7.5	0
Aug. 27		2.7	.10	33	11	2.1	1.8	82	62	1.0	.4	.1	154	128	60	265	7.7	0

a Residue on evaporation at 180°C.

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
4780. TANANA RIVER NEAR BIG DELTA																		
Oct. 19, 1957		12.0	0.02	43	6.1	5.3	2.8	130	32	3.0	0.1	0.8	169	132	26	277	7.7	0
Nov. 24		15	.02	37	15	5.2	2.4	161	29	1.5	.2	1.0	185	154	22	302	7.8	0
Jan. 5, 1958		13	.02	40	10	4.1	2.5	146	29	1.0	.0	1.1	173	141	22	290	7.6	0
Feb. 11		11	.02	38	8.1	3.5	3.4	114	34	4.5	.0	.6	159	128	35	266	7.2	0
May 7		5.8	.11	33	7.1	3.9	2.3	110	24	3.0	.2	.9	134	112	22	232	6.6	10
June 4		8.1	.08	32	7.4	3.7	2.5	106	31	3.0	.0	.5	140	110	24	235	7.1	0
June 24		8.1	.22	28	8.9	3.9	1.7	101	28	4.0	.0	.4	133	106	24	226	7.4	10
Aug. 27		9.1	.09	28	15	4.4	1.9	113	42	3.0	.1	.3	160	132	39	264	--	0
TANGLE RIVER NEAR PAXSON																		
June 12, 1958		5.0	0.07	3.2	1.9	1.1	0.8	17	1.0	2.5	0.1	0.1	24	16	2	31	6.1	10
July 21		10	.03	6.4	1.6	1.8	.5	31	.0	.5	.0	.4	36	22	0	57	6.6	0
Aug. 29		6.7	.12	7.9	3.1	2.4	.4	35	3.0	4.0	.0	.1	45	32	4	68	6.8	0
Sept. 24		6.7	.04	8.7	2.4	3.5	.5	36	2.0	4.5	.2	.2	47	32	2	79	6.4	20
4781. DELTA RIVER NEAR RAPIDS																		
Oct. 19, 1957		6.2	0.02	37	3.5	3.9	1.4	88	37	3.0	0.1	0.6	136	107	35	226	7.5	3
Nov. 24		7.7	.02	36	13	4.8	2.2	120	52	3.0	.0	.4	178	144	45	297	7.9	0
Jan. 5, 1958		5.7	.02	39	12	5.3	2.5	121	55	3.0	.0	.6	183	147	48	308	7.5	0
June 5		5.1	.20	17	5.0	1.8	1.0	61	17	2.5	.0	.3	80	63	13	134	7.1	20
June 25		4.5	.15	22	9.4	2.1	1.8	75	32	2.5	.0	.2	112	94	32	191	7.4	0
Aug. 28		5.3	.07	22	12	3.0	1.4	81	39	4.0	.0	.0	127	104	38	208	7.6	0
DELTA RIVER AT BIG DELTA																		
Jan. 5, 1958		6.8	0.02	38	8.4	2.4	3.6	120	36	1.5	0.0	1.7	157	130	31	266	7.8	0
Feb. 14		7.6	.02	39	8.0	2.9	4.0	125	36	.5	.0	1.4	161	130	28	284	7.3	0
SHAW CREEK AT SHAW CREEK																		
Oct. 19, 1957		19	0.57	21	8.3	4.5	1.8	98	16	1.0	0.2	1.3	122	86	6	182	7.4	25
Jan. 5, 1958		14	.02	42	11	5.7	2.9	162	28	3.0	.0	1.1	188	150	17	316	7.5	0
May 7		6.4	.20	13	3.6	2.0	1.7	46	13	.5	.1	.9	a85	48	10	98	6.5	60

a Residue on evaporation at 180°C.

MISCELLANEOUS ANALYSES OF STREAMS IN ALASKA--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (calculated)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
McKINLEY RIVER AT TERMINUS MULDROW GLACIER																		
Aug. 5, 1958		5.4	0.10	22	6.1	1.1	1.5	78	19	3.5	0.1	0.2	97	80	16	157	7.5	0
5646. MELOZITNA RIVER NEAR RUBY																		
Jan. 20, 1958	b53.3	9.2	0.02	16	4.9	3.7	1.2	65	10	2.0	0.2	1.3	80	60	7	135	6.7	5
June 18	b3,440	6.3	.219	6.4	1.9	1.3	.4	24	3.6	.5	.2	1.0	34	24	4	52	6.5	80
Sept. 17	b2,310	7.2	.25	9.9	2.6	1.9	.5	39	6.0	.5	.3	.7	49	35	3	80	7.0	55
OGOTORUK CREEK NEAR POINT HOPE																		
July 10, 1958		2.2	0.07	5.6	1.9	4.1	0.8	18	10	4.0	0.1	0.5	38	22	7	70	6.5	30
July 20, 25, 30, Aug. 8		2.4	.02	4.8	1.9	4.3	.6	17	10	3.5	.1	.1	36	20	6	68	6.7	0
Aug. 11, 12		2.6	.26	5.2	1.6	3.9	1.0	18	7.5	3.5	.1	.8	35	20	4	62	6.5	55
Aug. 17		2.9	.02	5.6	1.9	4.8	.6	18	11	4.0	.1	.4	40	22	7	73	6.7	30

b Discharge at time of sampling.

INDEX

U.S. GOVERNMENT PRINTING OFFICE: 1960 O - 550195