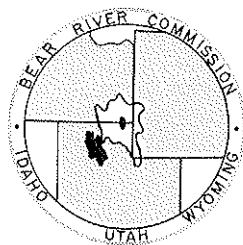


EIGHTH ANNUAL REPORT

BEAR RIVER
COMMISSION

1965



For the Report Year October 1, 1964 to

September 30, 1965

LOGAN, UTAH

April 1, 1966

BEAR RIVER COMMISSION

P. O. BOX 413
LOGAN, UTAH

April 1, 1966

Mr. President:

Submitted herewith is the Eighth Annual Report of the Bear River Commission, as required by Article III D 2 of the Bear River Compact.

A copy of the report is being transmitted to the Governor of each signatory State to the Bear River Compact.

Very truly yours,

A handwritten signature in cursive script that reads "Wallace N. Jibson".

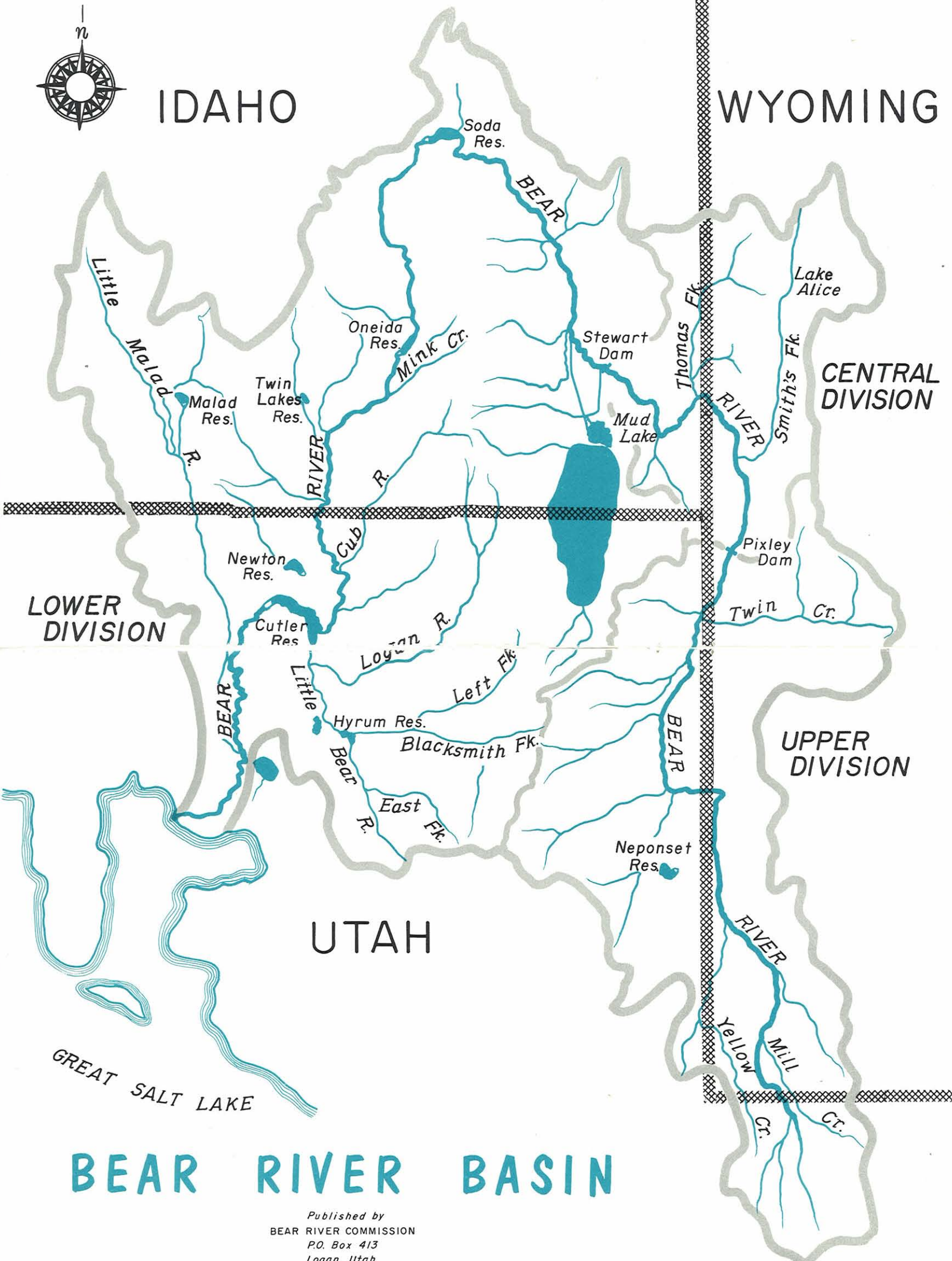
Wallace N. Jibson
Assistant Secretary

The President
The White House
Washington, D. C.



IDAHO

WYOMING



UTAH

CENTRAL DIVISION

LOWER DIVISION

UPPER DIVISION

BEAR RIVER BASIN

Published by
BEAR RIVER COMMISSION
P.O. Box 413
Logan, Utah

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EIGHTH ANNUAL REPORT

OF THE

BEAR RIVER COMMISSION

April 1, 1966

INTRODUCTION

The Bear River Compact determines the rights and obligations of the signatory States of Wyoming, Idaho, and Utah with respect to the waters of Bear River. Federal consent to the Compact was given by the Congress and signed by the President, March 17, 1958. The Bear River Commission was organized as an interstate agency to administer the Compact.

Article III D 2 of the Compact provides that the Bear River Commission shall compile annually a report covering the work of the Commission for the water year ending the previous September 30 and transmit it to the President of the United States and to the Governors of the signatory States on or before April 1 of each year.

Activities of the Bear River Commission during the water year ending September 30, 1965 are summarized in this report. Financial report of the auditors and daily streamflow records are shown in the appendixes.

ORGANIZATION

Ten commissioners, three representing each State and one the United States, constitute the Bear River Commission. The Federal representative serves as Chairman without vote.

Dr. Evan M. Kackley, Soda Springs, was appointed in April 1965 to the Bear River Commission as a member from Idaho. He succeeded Melvin Lauridsen who passed away in October 1964. Dr. Kackley served only a few months before resigning to accept an appointment to the Idaho Water Resources Board, and Lloyd Dunn was appointed in his place.

Cleo L. Swenson, Preston, was elected Vice-Chairman of the Commission at the annual meeting, April 23, 1965. Other officers were re-elected by acclamation.

OFFICERS

ChairmanE. O. Larson, Salt Lake City, Utah
Vice-ChairmanCleo L. Swenson, Preston, Idaho
Secretary-TreasurerJay R. Bingham, Bountiful, Utah
Assistant SecretaryWallace N. Jibson, Logan, Utah

MEMBERS

Idaho

Carl E. TappanBoise, Idaho
Lloyd DunnGeorgetown, Idaho
Cleo L. SwensonPreston, Idaho

Utah

Jay R. BinghamBountiful, Utah
Lawrence B. JohnsonRandolph, Utah
A. V. SmootCorinne, Utah

Wyoming

Floyd A. BishopCheyenne, Wyoming
S. Reed DaytonCokeville, Wyoming
J. W. MyersEvanston, Wyoming

United States

E. O. LarsonSalt Lake City, Utah

Budget

A. V. SmootCorinne, Utah
J. W. MeyersEvanston, Wyoming
Lloyd DunnGeorgetown, Idaho

Operations

Cleo L. SwensonPreston, Idaho
Lawrence B. JohnsonRandolph, Utah
S. Reed DaytonCokeville, Wyoming

MEETINGS

An amendment to the bylaws was adopted November 23, 1964 changing the Regular Meeting date to the fourth Monday in November each year. Accordingly, Commission meetings were held as follows:

Regular Meeting — November 23, 1964 — Salt Lake City, Utah

Annual Meeting — April 23, 1965 — Salt Lake City, Utah

BUDGET AND FISCAL DISBURSEMENTS

ADOPTED BUDGET

	<i>Fiscal Year Ending 6-30-1965</i>	<i>Fiscal Year Ending 6-30-1966</i>	<i>Total Biennium Ending 6-30-1966</i>
Compact Administration			
Personal Services	\$ 7,201	\$5,690	\$12,891
Travel and Subsistence	1,400	1,000	2,400
General Office Expense	400	300	700
Fiscal and Administrative	427	300	727
Washington Office Tech. Charge	922	710	1,632
Printing and Reproduction	700	500	1,200
Treasurer (Bond and Audit)	400	300	700
Transcribing Minutes	150	150	300
Legal Retainer Fee	300	300	600
Miscellaneous	100	100	200
Sub-Total	\$12,000	\$9,350	\$21,350
 Stream-Gaging Program			
U.S. Geological Survey	\$38,344	\$45,800	\$ 84,144
Total	\$50,344	\$55,150	\$105,494

ALLOCATION OF BUDGET

U. S. Geological Survey	\$19,594	\$22,900	\$42,494
State of Idaho	10,250	10,750	21,000
State of Utah	10,250	10,750	21,000
State of Wyoming	10,250	10,750	21,000
Total	\$50,344	\$55,150	\$105,494

All disbursements of Commission funds are made by check on vouchers signed by the Secretary-Treasurer, and approved and countersigned by the Chairman or Vice-Chairman.

The audit of accounts and records, including balance sheet of June 30, 1965 and statement of budget revenue and appropriation accounts for the fiscal year ended June 30, 1965, are included in this report as appendix A.

STREAM-GAGING PROGRAM

A cooperative, basin-wide program of stream gaging is administered by the Geological Survey project engineer at Logan, Utah. The Geological Survey and Bear River Commission contribute equally to finance the collection of daily streamflow records at about 50 gaging stations. An additional eight gaging stations in the basin are operated by Utah Power & Light Company in connection with Federal Power Commission projects. Streamflow records of significance to the Commission are published herein as appendix B.

New gaging stations in 1965 include one on Muddy Creek, tributary of Smiths Fork in Wyoming, being operated to determine potential reservoir storage on this creek. Also, collection of a supporting record was started in November 1965 on Mill Creek above its confluence with Muddy Creek.

Seasonal daily or partial records were collected on about 130 diversions above Bear Lake by district water commissioners under the general supervision of the Geological Survey. These records include all of the diversions from Bear River main stem and Smiths Fork, as they are required to administer the Bear River Compact. Daily discharge records for canals in the Central Division (see frontispiece map) are listed in tables 1-5; those in the Upper Division are not published herein but are maintained in the Commission files.

WATER SUPPLY

Watershed yield in 1965 from the upper Bear River basin and Smiths Fork exceeded that of any year back to the early twenties. However, the total basin runoff reaching Bear Lake was exceeded in 1950 and 1952, and runoff from most tributaries below Bear Lake was exceeded in several years during the period. Snowmelt peaks generally were below maximum of record but were followed by exceptionally high base flows that have been maintained above average into the spring of 1966.

Monthly and yearly runoff in 1965 at three representative gaging stations is compared with a longtime average in the bar graphs of figure 1 and is summarized for the irrigation season and water year in the tables below. Runoff at two of these stations is the major supply to the Upper and Central Divisions so it is plotted also on daily hydrographs in figures 2 and 3.

Runoff in Acre-feet May-September

	Average 1943-65	1964	1965
Upper Bear River	113,200	120,600	189,600
Smiths Fork	108,300	117,600	153,000
Logan River	118,300	114,100	165,800

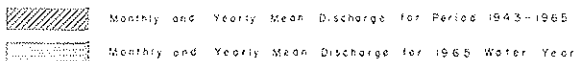
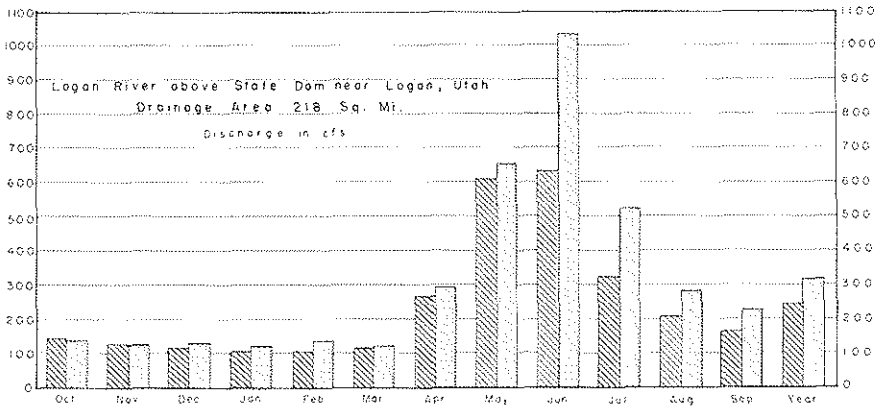
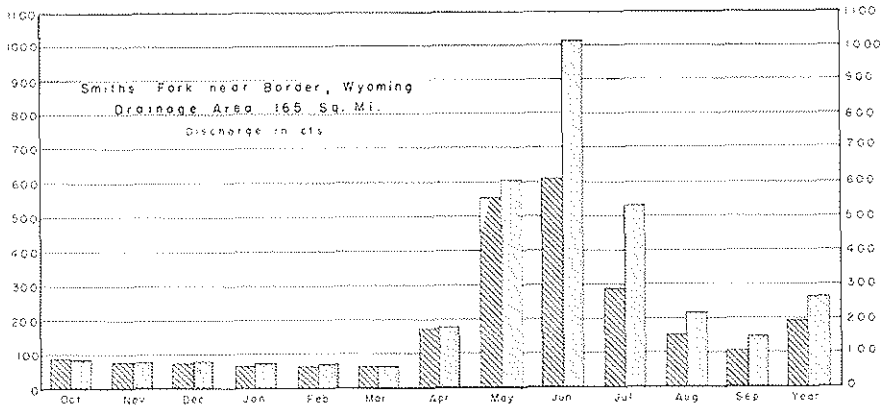
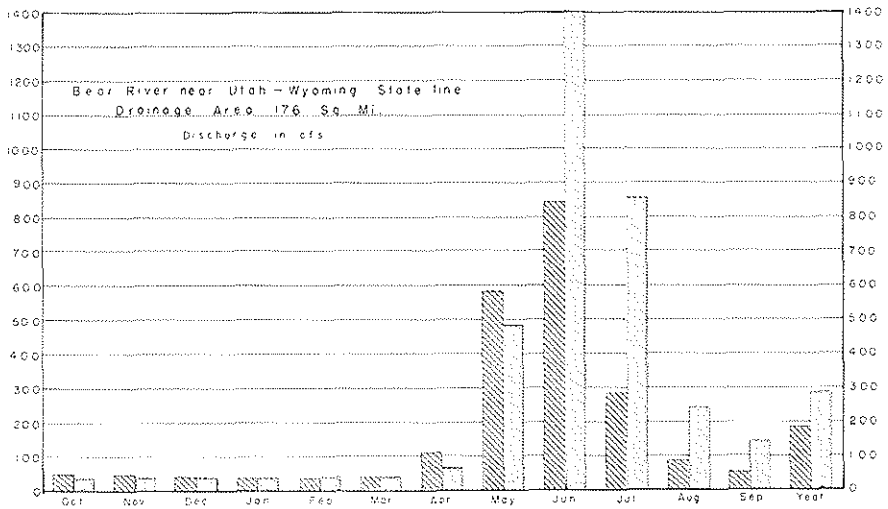


Figure 1 Comparison of discharge at three representative gaging stations in 1965 with average discharge for period 1943-65

UPPER DIVISION - BEAR RIVER SUPPLY *
CUBIC FEET PER SECOND

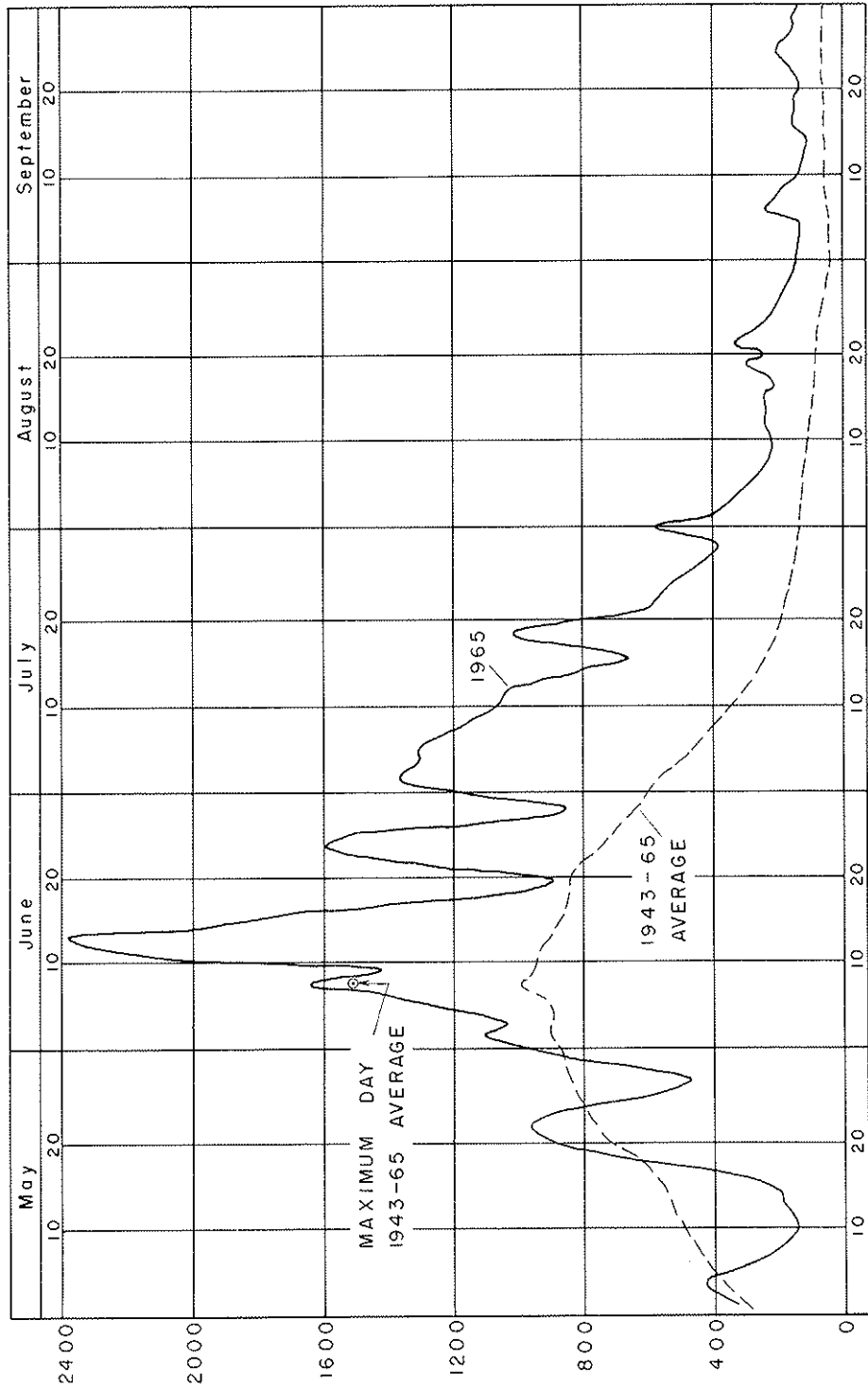
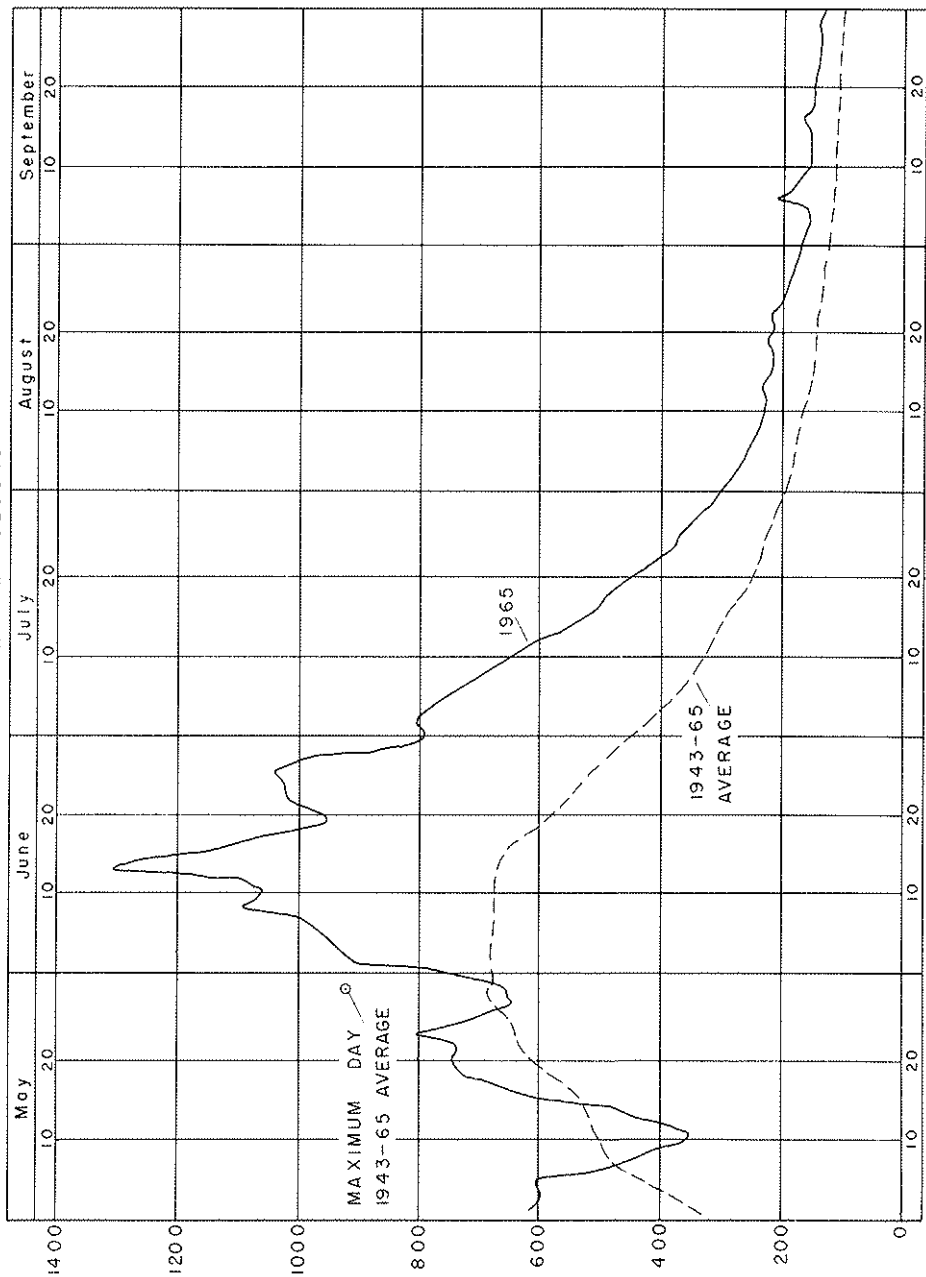


Figure 2

* Bear River near Utah-Wyoming State Line

CENTRAL DIVISION — SMITHS FORK SUPPLY *

CUBIC FEET PER SECOND



* Smiths Fork near Border, Wyoming

Figure 3

*Runoff in Acre-feet
Water Year*

	1943-65	1964	1965
Upper Bear River	134,700	135,600	206,800
Smiths Fork	140,100	149,500	190,500
Logan River	177,700	159,200	230,200

The amount of water diverted to storage in Bear Lake exceeded that of any previous year; however, the amount available for storage from Bear River was exceeded in the early twenties, in 1950, and in 1952. The seasonal peak elevation of 5,922.74 feet (1,357,000 acre-feet) was 0.91 foot below the previous maximum. Subsequent demand for storage water was less than in any other year and depleted the lake by only 64,000 acre-feet.

The bar graph in figure 4 illustrates the operation of Bear Lake in 1965 in comparison with a longtime average. A daily hydrograph in figure 5 shows elevation and content, and a table of daily contents is included with streamflow records in appendix B.

*Bear Lake Elevation
Utah Power & Light Co. Datum*

<i>Water Year</i>	<i>Beginning of Water Year</i>	<i>End of Storage Period</i>	<i>End of Water Year</i>
1963	5,913.43	5,915.63	5,912.93
1964	5,912.93	5,917.67	5,915.23
1965	5,915.23	5,922.74	5,921.83

ADMINISTRATION OF BEAR RIVER COMPACT

Provisions of the Compact are administered and enforced by direction of the Bear River Commission. However, water rights within each State are adjudicated and administered in accordance with State law subject to limitations provided in the Compact.

Cooperative stream-gaging agreements with the Geological Survey include a program of administrative and technical assistance to the Commission financed without matching Federal funds. This program is directed by the Geological Survey project engineer at Logan where the project office is also the principal office of the Commission.

The project engineer is Assistant Secretary to the Commission with responsibility of providing technical assistance and current stream-flow information required to administer the Compact. He establishes operational procedures, conducts hydrologic studies, compiles annual reports, and maintains the records of the Commission.

Expenses incurred by the Bear River Commission are paid equally by the signatory States. Compensation and expenses of the Federal representative, each commissioner, and each adviser are paid by the Government which he represents.

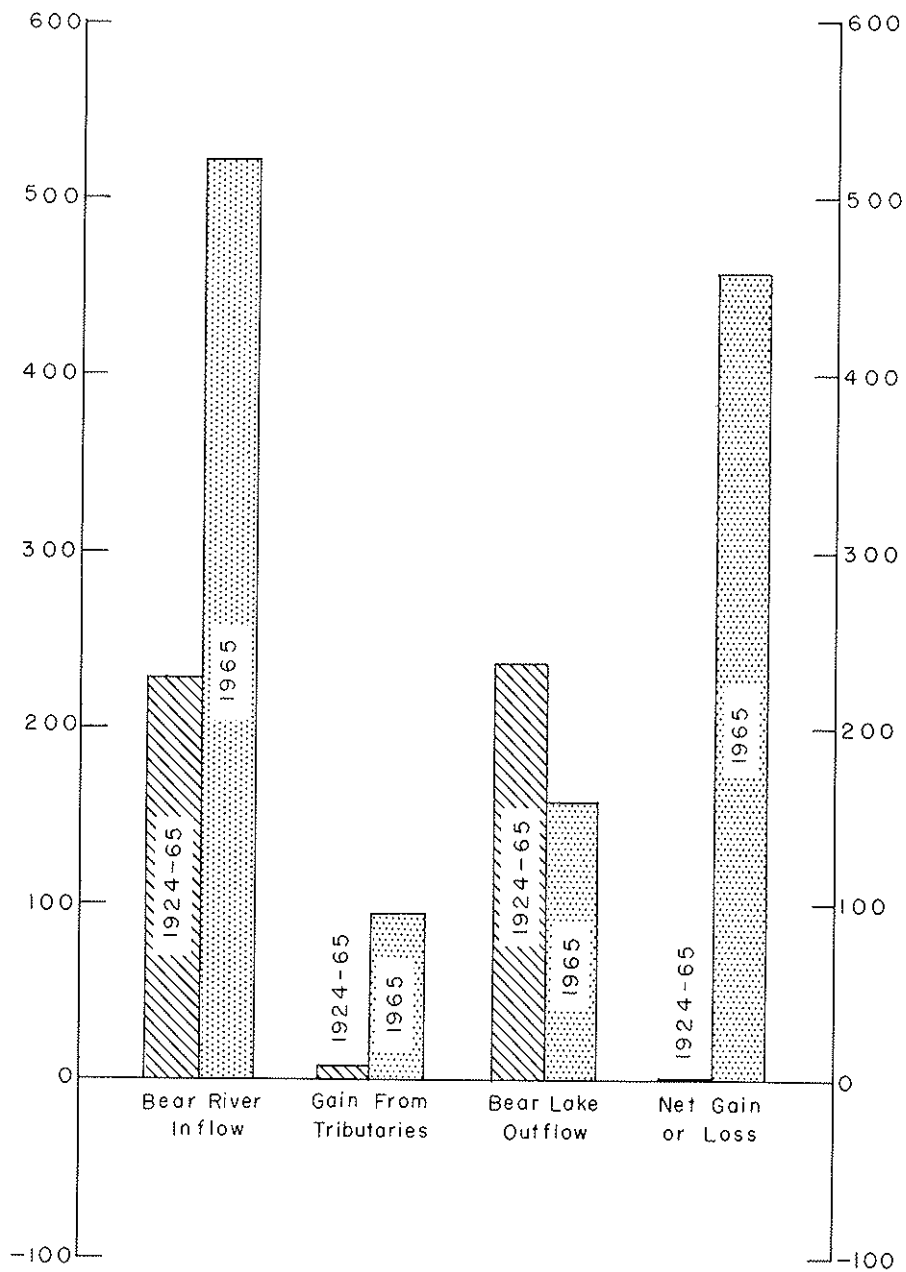


Fig 4. BEAR LAKE
Annual Quantities in Thousands of Acre-Feet

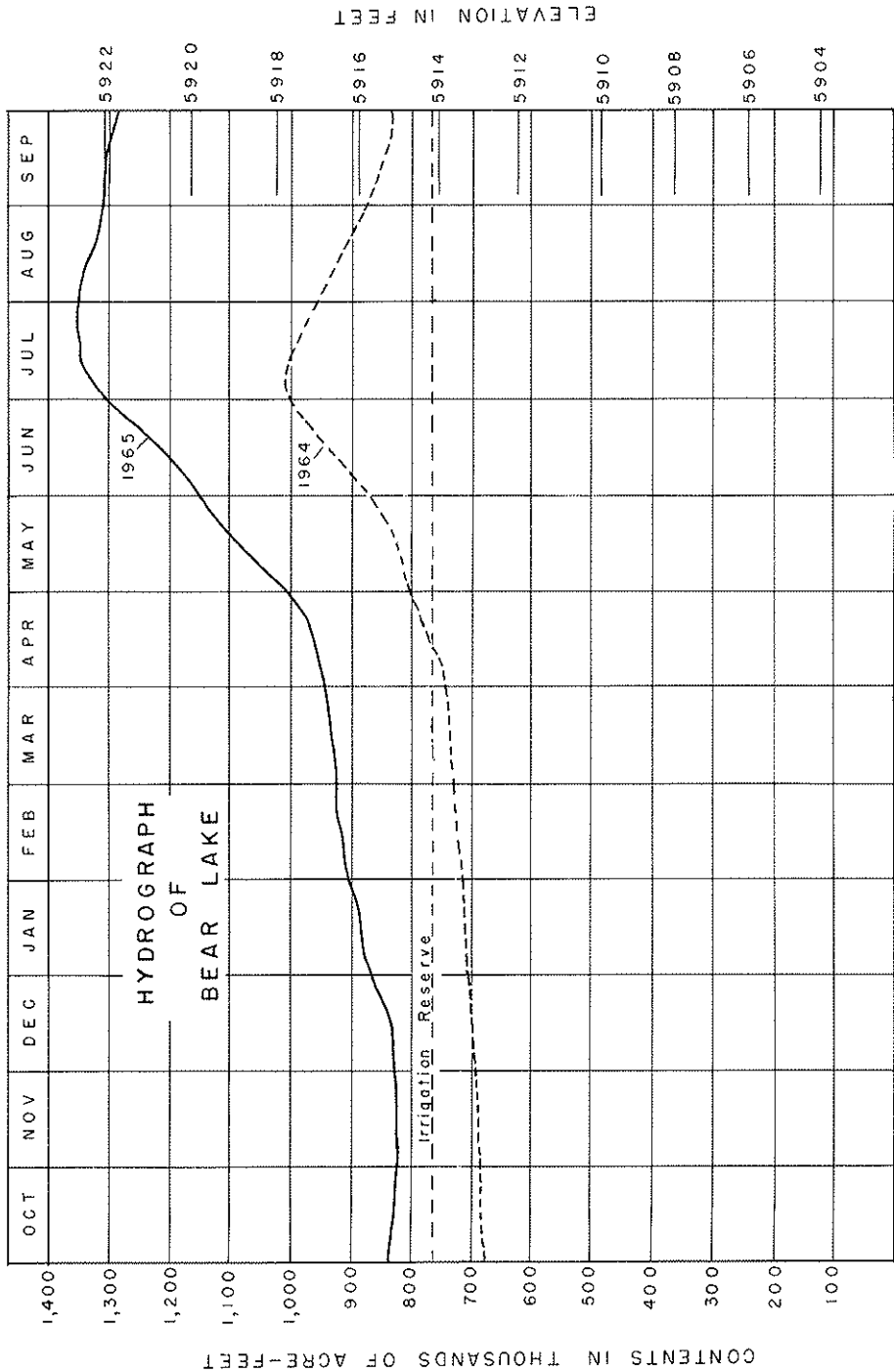


Figure 5

STREAMFLOW DISTRIBUTION

Records of diversions from Bear River main stem above Bear Lake and from Smiths Fork were collected by district water commissioners and submitted weekly to the Assistant Secretary. He computed section diversions and allocations and informed these district commissioners and members of the Commission of the quantities diverted and of State section allocations, where applicable, for such regulatory action needed to comply with the Compact.

Upper Division

The Upper Division comprises that part of the basin above and including Pixley Dam and includes two sections in Wyoming and two in Utah. The Compact provides that when the total diversions in the division plus the flow passing Pixley Dam is less than 1,250 cfs (divertible flow), a water emergency exists and such divertible flow is allocated to sections as follows:

Upper Utah Section Diversions	0.6 percent
Upper Wyoming Section Diversions	49.3 percent
Lower Utah Section Diversions	40.5 percent
Lower Wyoming Section Diversions	9.6 percent

Diversion in the Upper Wyoming Section with Compact operational data are shown in figure 6 in which two periods of water emergency are noted, first during most of May and again after July 25. Allocation in May was based on 49.3 percent of the divertible flow and on 58.9 percent in the July-September period under the Compact provision permitting transfer of unused allocation between sections in a State. (See Lower Wyoming diversions, figure 7.) The Wyoming diversion rate was less than half the allocation during periods of water emergency.

Diversions in the lower sections of this division are shown in figure 7, also the flow leaving the division past Pixley Dam. Though Compact allocation is not shown on the graph, it was significant only for a brief period in May when all available supply (see flow passing Pixley Dam) was retained for diversion at and above Pixley Dam. Lower Wyoming was able to divert more than its allocation during this 10-day period.

Natural flow passed through the spillway at Woodruff Narrows Dam throughout most of the season. (See Figure 8.) Anticipated release of storage for fall irrigation did not take place because wet meadow land delayed haying operations much later than usual. Likewise, Sulphur Creek Reservoir remained full during most of the season with very little demand for stored water.

Central Division

The Central Division comprises that part of the basin from Pixley Dam down to and including Stewart Dam (the point of diversion to Bear Lake). It includes a section in Wyoming and one in Idaho.

Divertible flow in the Central Division is the sum of diversions from Smiths Fork and designated tributaries, diversions from Bear River in the division, and flow passing Stewart Dam. A water emergency shall exist when this divertible flow is less than 870 cfs, or when Bear River entering Idaho (gaging station at Border) is discharging less than 350 cfs. Wyoming diversions are limited to 43 percent of the divertible flow during a water emergency.

Hydrographs for Wyoming Section in the Central Division are shown in figure 9. Wyoming diversion, as in the Upper Division, was far below Compact allocation during the short period of water emergency. Interstate allocation was in effect after August 15 when the divertible flow fell below 870 cfs, yet the river flow passing Border did not decrease below 350 cfs at any time during the season. This unusual condition of these events not occurring with a few days of each other evidently will happen only in years of high runoff when a smaller proportion of the supply is diverted.

Similar hydrographs to those shown in figure 9 for Wyoming Section are shown in figure 10 for Idaho Section. In the table below is a comparison of water diverted to irrigated lands in the two sections for the past five years. The flow passing Stewart Dam and the flow diverted to Bear Lake have been excluded in computing the Idaho diversion rate, though these flows are included in the total divertible flow in the division.

Diversion in acre-feet per acre

May-September

	1961	1962	1963	1964	1965
Wyoming Section	2.16	5.82	5.06	4.48	4.96
Idaho Section	1.72	3.26	3.28	2.91	2.87

Lower Division

Authority is given the Commission upon its own motion to declare a water emergency in any division, and in the Lower Division such a declaration may be made also upon petition of an aggrieved Utah user against an Idaho user. Upon declaration of an emergency, the Commission is required to enforce water-delivery schedules based on priority of rights without regard to State lines.

There were no petitions filed with the Commission or water emergencies declared in the Lower Division in 1965.

Interstate Tributaries

An aggrieved lower-State user on an interstate tributary may petition for declaration of a water emergency and distribution of flow under direction of the Commission. Interstate arbitration on tributaries was not requested in 1965.

STORAGE

New Storage

The Compact defines storage rights in existing reservoirs above Bear Lake and provides for an additional storage allowance of 36,500 acre-feet annually. Idaho users on Thomas Fork are allotted 1,000 acre-feet of this amount and the remainder is divided equally between Wyoming and Utah.

The reservoirs shown below have been constructed under additional storage provisions of the Compact, and all were filled to capacity in 1965. A total allocation to Woodruff Narrows Reservoir for storage of 18,240 acre-feet includes 15,240 acre-feet from Utah and 3,000 acre-feet from Wyoming.

<i>Reservoir</i>	<i>Allocation</i>
Sulphur Creek Reservoir (Wyoming)	4,615 ac-ft
Sulphur Creek Reservoir Enlargement (Wyoming)	1,100 ac-ft
J. L. Martin Reservoir, Sulphur Creek (Wyoming)	88 ac-ft
A. J. Barker Reservoir, Yellow Creek (Utah)	162 ac-ft
Hatch Brothers Reservoir (Utah)	350 ac-ft
Woodruff Narrows Reservoir (Utah-Wyoming)	18,240 ac-ft
Total Allocation	24,555 ac-ft

Bear Lake

Article V of the Compact provides an irrigation reserve level in Bear Lake below which water shall not be released solely for generation of power, except in emergency, but after release for irrigation it may be used in generating power as it is conveyed to irrigation diversion works. The reserve is to be increased by designated amounts as additional storage, under terms of the Compact, is developed above Bear Lake. The irrigation reserve was increased by Commission resolution April 30, 1962 to include the water in the lake below elevation 5,914.15 feet (764,000 ac-ft) corresponding to 20,000 ac-ft of additional storage.

The hydrograph of Bear Lake in figure 5 shows the lake surface was above the irrigation reserve level throughout the 1965 water year. Discharge records of Bear Lake Outlet Canal and Bear River near Collinston (appendix B) show no release from the lake from October 1 until July 9. Then, from the latter part of July through the end of the irrigation season 127,000 acre-feet was released and about 150,000 acre-feet discharged through Cutler power plant. Releases from the lake continued through the winter of 1965-66 to lower the lake sufficiently for storage of spring runoff and thereby lessen flood potential below the lake.

APPLICATIONS FOR APPROPRIATION

Article X of the Compact states, "Applications for appropriation, for change of point of diversion, place and nature of use, and for exchange of Bear River water shall be considered and acted upon in accordance with the law of the State in which the point of diversion is located, but no such application shall be approved if the effect thereof will be to deprive any water user in another State of water to which he is entitled. The official of each State in charge of water administration shall, upon the filing of an application affecting Bear River water, transmit a copy thereof to the Commission."

Applications for appropriation presented to the Commission in 1965 generally applied to ground water development for supplemental irrigation supply in the basin below Bear Lake. In addition, an application by the Bureau of Reclamation was presented for the proposed Honeyville Reservoir in Box Elder County, Utah in the amount of 300 cfs and 150,000 acre-feet. A summary of other applications by Compact divisions is as follows:

Upper Division	4.2 cfs	Lower Division (Ida.)	10.2 cfs
Central Division (Wyo.)....	7.1 cfs	Lower Division (Utah)	31.1 cfs

UPPER DIVISION - UPPER WYOMING SECTION

CUBIC FEET PER SECOND

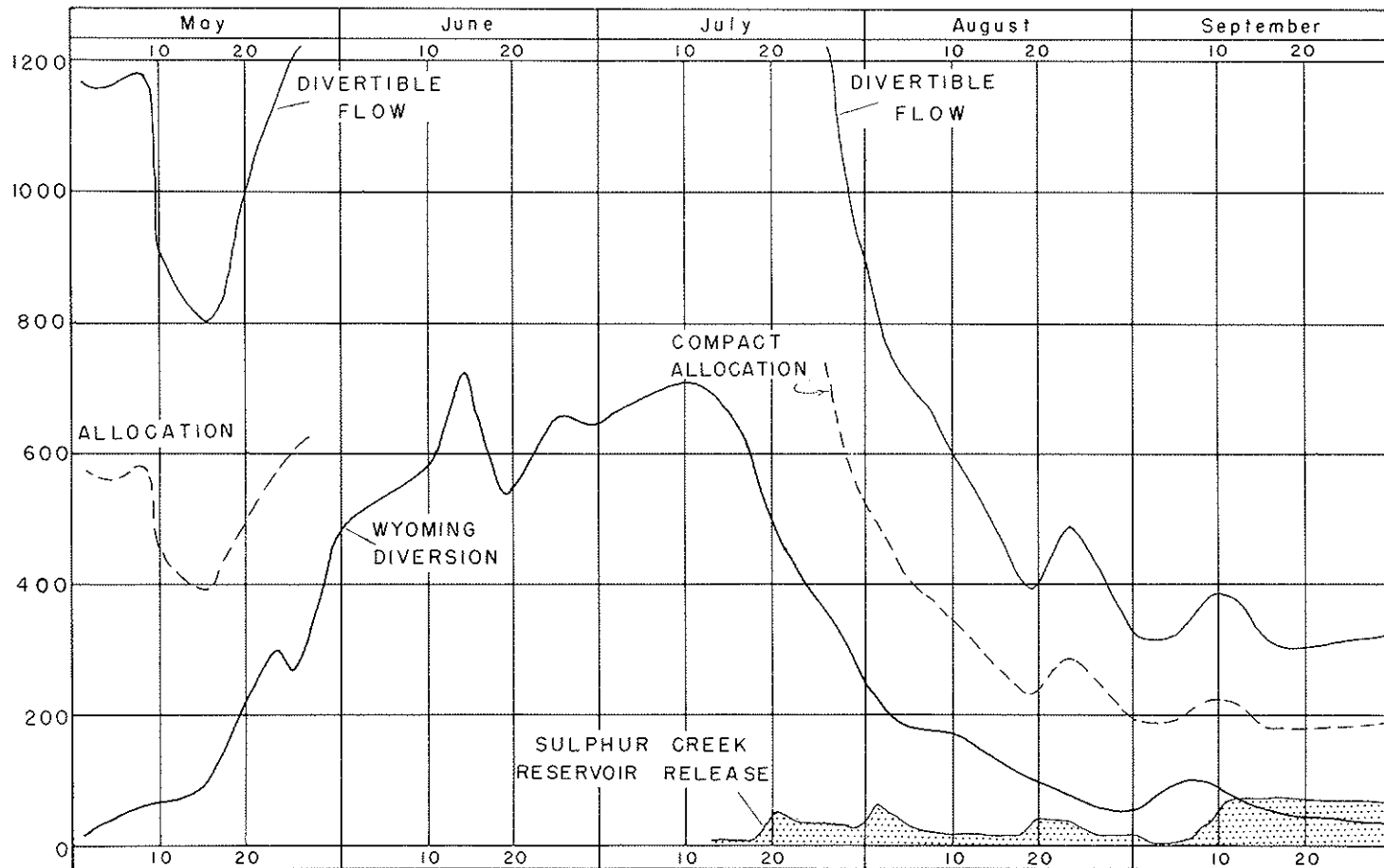


Figure 6

UPPER DIVISION - LOWER SECTIONS
CUBIC FEET PER SECOND

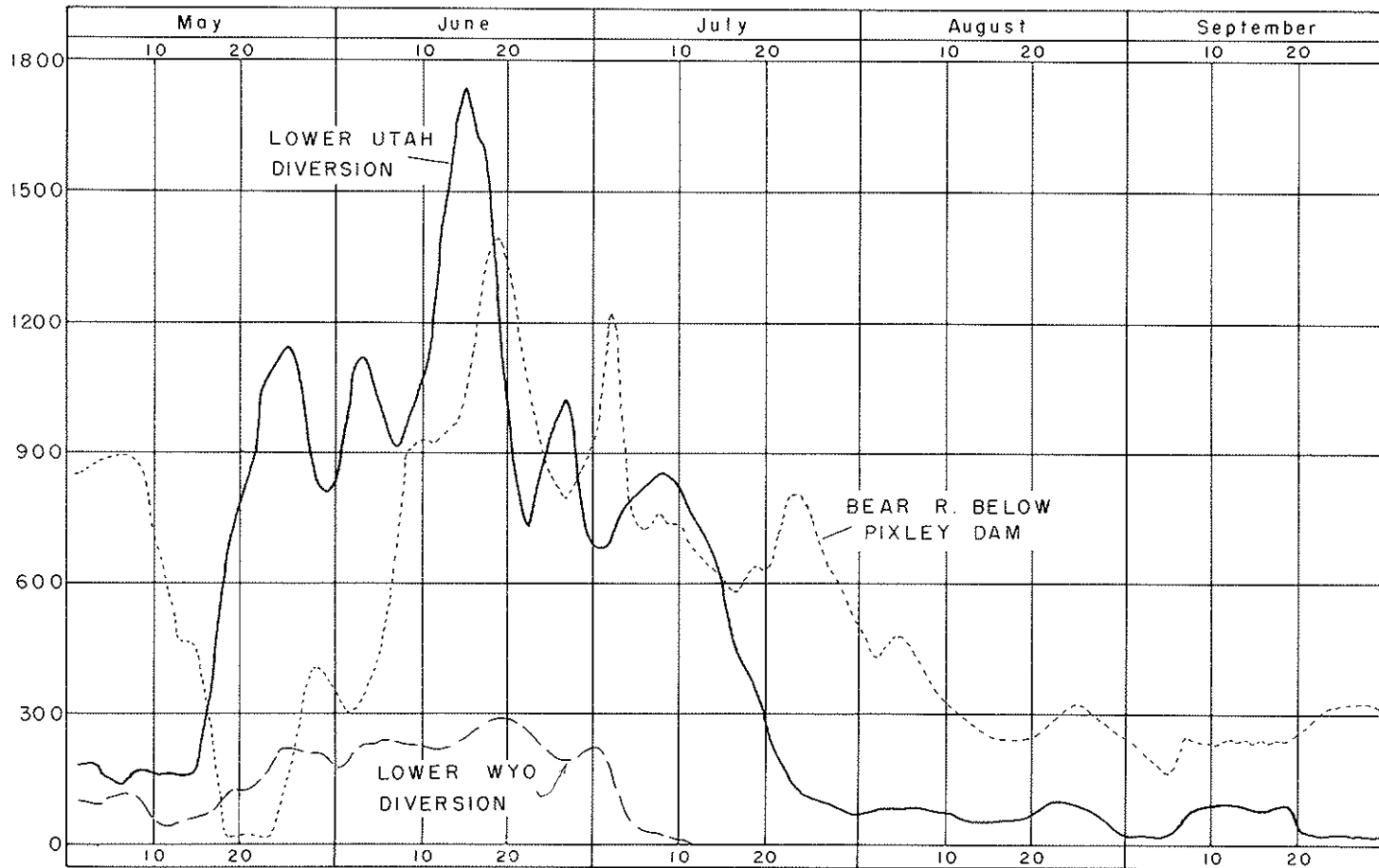


Figure 7

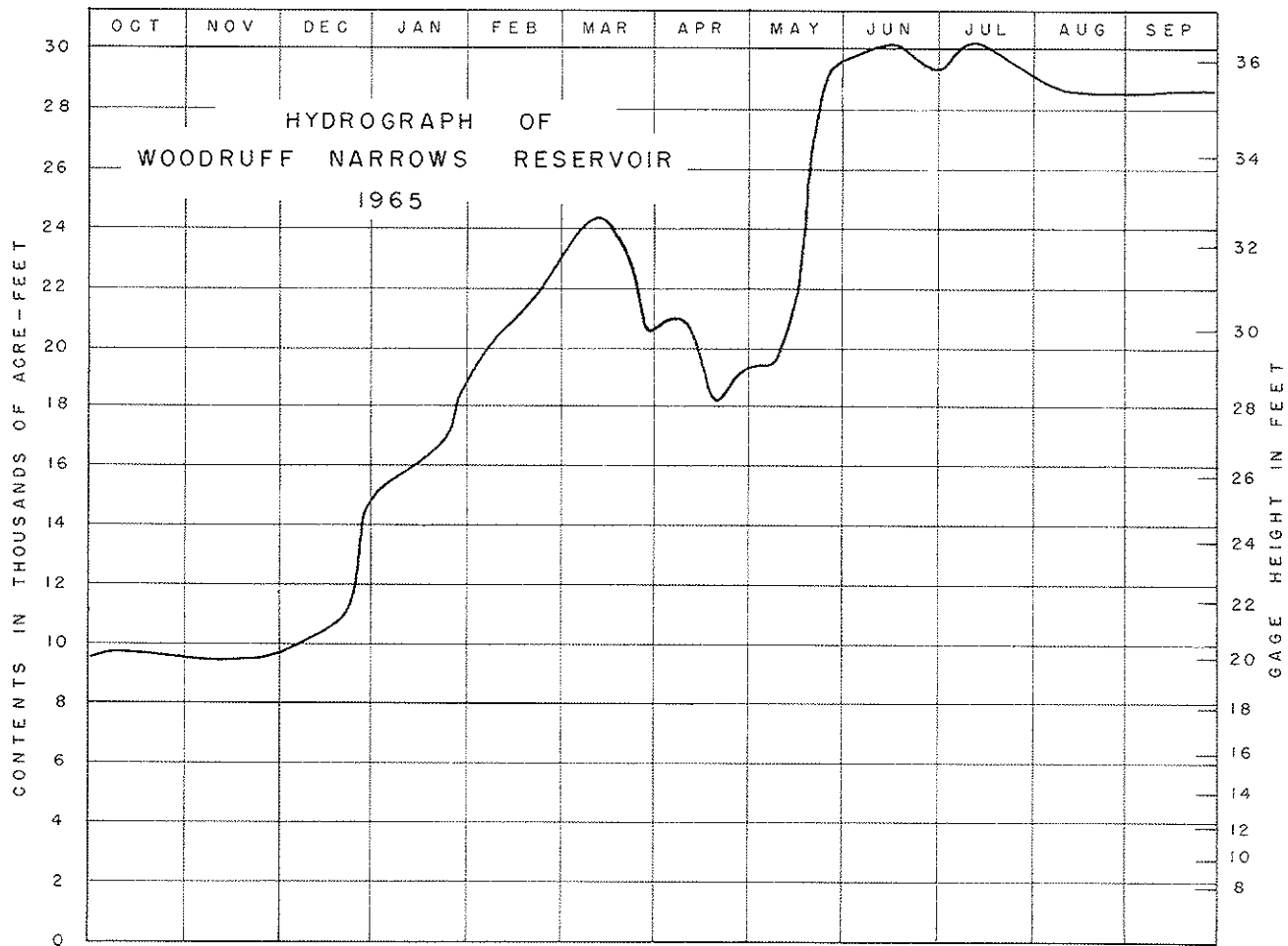


Figure 8

CENTRAL DIVISION - WYOMING SECTION

CUBIC FEET PER SECOND

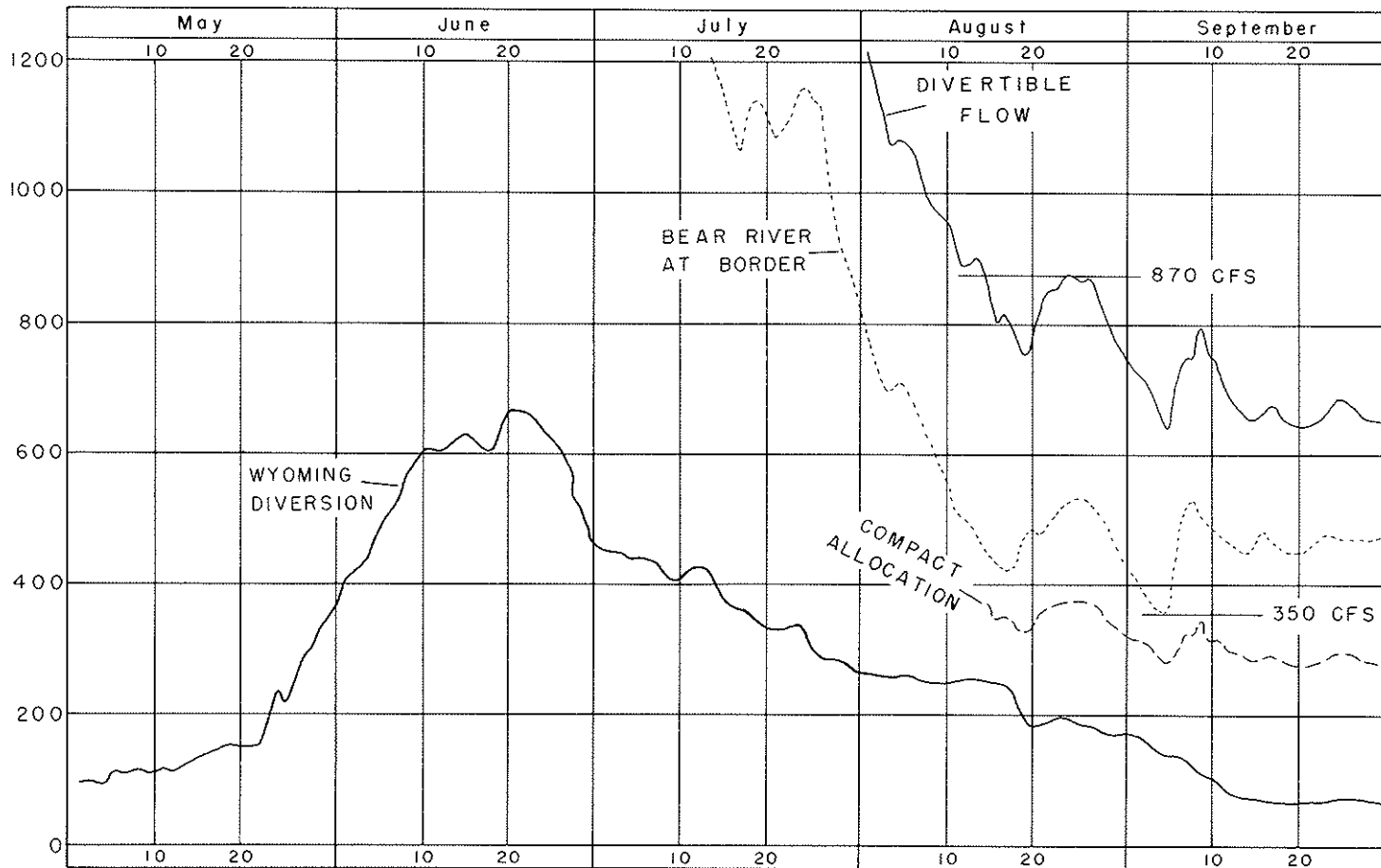


Figure 9

CENTRAL DIVISION - IDAHO SECTION

CUBIC FEET PER SECOND

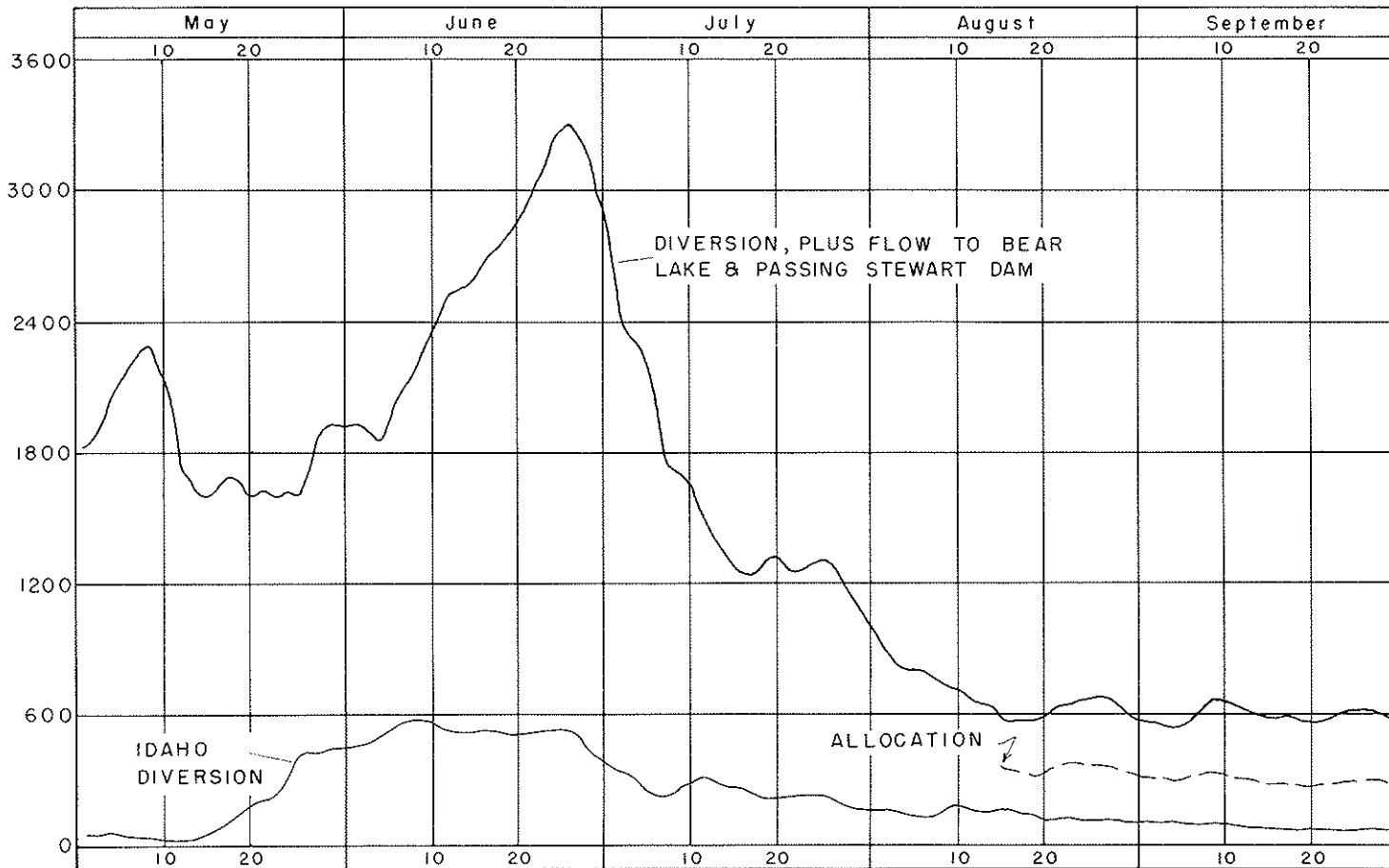


Figure 10

APPENDIX A

L. WILLIAM ANDERSON
CERTIFIED PUBLIC ACCOUNTANT
2870 EAST 3300 SOUTH * TELEPHONE 487-7176
SALT LAKE CITY 9, UTAH

November 12, 1965

Bear River Commission
Utah State Capitol Building
Salt Lake City, Utah

Gentlemen:

In accordance with your instructions, I have examined the records and accounts of the Bear River Commission for the fiscal year ended June 30, 1965 and now submit my report thereon.

My audit included a review of the financial transactions, and examination of the statement of revenue and expenditures for the year and budget estimates and related expenditures, as published with minutes of the meetings held November 23, 1964 and April 23, 1965.

I confirmed the funds available at June 30, 1965 by direct correspondence with the depository. My examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as I considered necessary in the circumstances. All cash receipts have been properly accounted for and all disbursements were duly authorized and appeared in order. Operational expenditures for the program are made directly by the United States Geological Survey and are set out in detail in my report. Locally administrative expenses amounting to \$1,696.61 were disbursed by the local office.

The results of my examination are presented herewith and include comments and explanatory detail as appropriate in the following described statements:

Exhibit "A" - Statement of Revenue and expenditures for the fiscal year ended June 30, 1965 .

Exhibit "B" - Statement of available revenue and appropriations thereof for the fiscal year, showing balances unexpended at June 30, 1965.

Schedule "A-1" - Statement of expenditures--stream-gauging program, allocated to the United States Geological Survey and to the Bear River Commission.

GENERAL COMMENTS

The Bear River Compact is a tri-state agreement between the signatory States of Wyoming, Idaho, and Utah with respect to the development and utilization of the waters of the Bear River. The Bear River Commission was organized April 5, 1958, and by-laws were adopted April 26, 1958, as an interstate administrative agency to carry out provisions of the Bear River Compact. The Commission is composed of ten Commissioners, three each with voting power, representing the States of Wyoming, Utah, and Idaho, and one, the United States, without vote. All expenses are charged to and paid by the three States on an equal basis.

As in prior years, the Commission entered into a cooperative agreement with the Geological Survey, United States Department of the Interior, at the beginning of the year, for the operation and maintenance of a gauging-station network. The expenses pertaining to this work are shared equally by the Commission and the Geological Survey, while other expenses incurred by the United States Geological Survey, which pertain directly to the compact administration are wholly financed by the Commission. Details of the financial transactions relating to this agreement for the fiscal year ended June 30, 1965, are presented in Schedule "A-1".

In my opinion, the accompanying statements of revenue and expenditures and supplemental statement of budget appropriations and related disbursements present fairly the cash position of the Bear River Commission at June 30, 1965, and the results of the financial transactions for the period then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Yours very truly,

L. William Anderson

BEAR RIVER COMMISSIONStatement of Revenue & Expenditures
For the Fiscal Year Ended June 30, 1965REVENUE:

State of Wyoming	\$10,250.00	
State of Idaho	10,250.00	
State of Utah	<u>10,250.00</u>	\$30,750.00

EXPENDITURES:

Commission's portion of direct expenses of the
stream-gauging program, Schedule "A-1"

Personal Services	\$21,043.50	
Travel and subsistence	2,341.00	
General office	1,766.00	
Fiscal and administrative	1,204.00	
Washington office charges	<u>2,645.50</u>	
Total--Schedule "A-1"		\$29,000.00

Administrative expenses:

Office Supplies and postage	\$ 65.00	
Auditing fee	200.00	
Legal consultant	300.00	
Transcript of minutes	70.00	
Printing Annual Report	972.61	
Printing By-Laws	<u>89.00</u>	
		<u>1,696.61</u>
		<u>30,696.61</u>

EXCESS OF REVENUE OVER EXPENDITURES FOR
THE FISCAL YEAR ENDED JUNE 30, 1965

\$ 53.39

FUNDS AVAILABLE AT JULY 1, 19645,705.30FUNDS AVAILABLE AT JUNE 30, 19655,758.69

Expenditures as above

\$30,696.61

Portion of expenditures incurred through
steam-gauging program allocated to and
paid direct by United States Geological Survey

19,594.00

Total expenditures as per Exhibit "B"

\$50,290.61

BEAR RIVER COMMISSIONStatement of Available Revenue and Appropriation Thereof
For the Fiscal Year, Showing Balances of June 30, 1965

<u>Cash Revenues:</u>	<u>Expected Revenue & Expenditures as Budgeted</u>	<u>Actual Revenue & Expenditures</u>	<u>Balance or Deficit (-) Compared to Budget</u>
Balance--funds on hand at July 1, 1964	\$ 5,705.30	\$ 5,705.30	\$ -0-
Revenue Receipts			
State of Wyoming	10,250.00	10,250.00	-0-
State of Idaho	10,250.00	10,250.00	-0-
State of Utah	10,250.00	10,250.00	-0-
	<u>\$36,455.30</u>	<u>\$36,455.30</u>	<u>\$ -0-</u>
<u>FUNDS FURNISHED DIRECT BY</u>			
<u>UNITED STATES GEOLOGICAL SURVEY</u>	<u>18,750.00</u>	<u>19,594.00</u>	<u>844.00</u>
<u>Total Funds Available</u>	<u>\$55,205.30</u>	<u>\$56,049.30</u>	<u>\$ 844.00</u>
<u>Appropriation Accounts:</u>			
Stream-gauging--Schedule "A-1"	\$37,500.00	\$38,344.00	\$ (844.00)
Personal Services	7,180.00	7,201.00	(21.00)
Travel and subsistence	1,400.00	830.00	570.00
Fiscal and administrative	450.00	460.00	(10.00)
Washington office charge	920.00	918.00	2.00
General office Expense	400.00	841.00	(441.00)
Printing Annual Report	700.00	972.61	(272.61)
Treasurer's Bond and Audit	400.00	200.00	200.00
Transcript of Minutes	150.00	70.00	80.00
Legal consultant	300.00	300.00	-0-
Miscellaneous	100.00	154.00	(54.00)
	<u>\$49,500.00</u>	<u>\$50,290.61</u>	<u>\$ (790.61)</u>
Unappropriated at July 1, 1964	<u>5,705.30</u>	<u>-0-</u>	<u>5,705.30</u>
	<u>\$55,205.30</u>	<u>\$50,290.61</u>	<u>\$ 4,914.69</u>
<u>BALANCE</u>	<u>\$ -0-</u>	<u>\$ 5,758.69</u>	<u>\$ 5,758.69</u>
<u>FUNDS AVAILABLE AT JUNE 30, 1965</u>		<u>\$ 5,758.69</u>	<u>\$ 5,758.69</u>

BEAR RIVER COMMISSION

Statement of Expenditures--Stream-Gauging Program
Allocated to the United States Geological Survey and to the
Bear River Commission for the fiscal Year Ended June 30, 1965

	<u>Allocable Expenditures</u>			<u>Charged Direct to Bear River Commission</u>	<u>Total Expenses to Bear River Commission</u>
	<u>Total</u>	<u>U.S. G. A. 50%</u>	<u>Bear River Commission 50%</u>		
Personal Services	\$28,529.00*	\$14,686.50	\$13,842.50	\$ 7,201.00	\$21,043.50
Travel and subsistence	3,022.00	1,511.00	1,511.00	830.00	2,341.00
General office	1,850.00	925.00	925.00	841.00	1,766.00
Fiscal and administration	1,488.00	744.00	744.00	460.00	1,204.00
Washington office	<u>3,455.00</u>	<u>1,727.50</u>	<u>1,727.50</u>	<u>918.00</u>	<u>2,645.50</u>
	<u>\$38,344.00</u>	<u>\$19,594.00</u>	<u>\$18,750.00</u>	<u>\$10,250.00</u>	<u>\$29,000.00</u>

*Unequal distribution of personal services expenditures due to supplemental Federal appropriation for salary increases during 4th quarter.

APPENDIX B

GAGING STATION RECORDS

Records of streamflow for State line and other key stations are included herein. The record consists of description of the station and a table showing the daily discharge in cubic feet per second and monthly and yearly runoff in acre-feet for the 1965 water year.

The description of the station gives the location, drainage area, records available, type and history of gage, average discharge, extremes of discharge, general remarks, and a statement of cooperation where applicable. This is essentially the same information published in annual water-supply papers of the Geological Survey.

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 second-foot-days for the month. The line headed "Mean" gives the average flow in cubic feet per second (second-feet) during the month. Flow for the month is expressed in acre-feet (line-headed "Ac-ft").

Records included herein have been collected by the U. S. Geological Survey through cooperative agreement with the Bear River Commission and by the Utah Power & Light Company.

BEAR RIVER BASIN

10-112. West Fork Bear River at Whitney Dam site, near Oakley, Utah

Location.--Lat 40°50'30", long 110°55'20", in NE¼ sec.9, T.1 N., R.9 W., on left bank, 1,380 ft below proposed Whitney Dam, 7 miles upstream from Deer Creek, 21.5 miles northeast of Oakley.

Drainage area.--7.5 sq mi, approximately.

Records available.--October 1963 to September 1965.

Gage.--Water-stage recorder. Altitude of gage is 9,120 ft (from topographic map).

Extremes.--Maximum discharge during year, 145 cfs June 13 (gage height, 1.95 ft); minimum daily discharge recorded, 1.4 cfs Apr. 14, 18, 1963-65; Maximum discharge, that of June 13, 1965; minimum, 1.2 cfs Apr. 18, 1964.

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

Discharge, in cubic feet per second, water year October 1964 to September 1965												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0				2.5	2.8	2.0	6.8	35	58	17	4.3
2	2.0				2.2	2.8	2.1	7.8	48	58	18	4.1
3	2.0				2.1	1.7	1.9	9.0	56	56	14	4.6
4	2.0				2.1	1.7	1.7	10	73	55	18	4.3
5	2.0				2.1	1.7	1.7	12	68	52	11	4.9
6	2.0				2.2	1.6	1.7	13	70	49	10	10
7	2.0			±2	2.2	1.6	1.6	11	68	48	9.3	8.7
8	2.1				2.2	1.7	1.8	7.8	78	*42	8.0	6.8
9	2.2				2.1	1.7	1.8	8.2	73	40	5.7	6.8
10	2.2				2.1	1.7	1.6	8.8	*161	37	7.9	8.8
11	2.0				2.1	1.7	1.7	5.8	112	35	7.8	4.5
12	2.1				2.1	1.7	1.7	5.8	112	36	7.3	3.9
13	2.1				2.1	2.6	1.6	8.6	120	27	6.2	2.8
14	2.1			*2.2	2.0	1.8	1.2	8.2	108	22	5.7	3.2
15	2.0			2.2	2.0	1.8	1.2	8.0	94	21	7.9	2.8
16	2.0	±2	±2	2.1	1.9	1.6	1.7	17.0	81	22	7.0	8.2
17	2.0			2.1	1.9	1.6	2.0	18.0	89	28	7.8	8.8
18				2.1	1.9	1.6	1.8	*32	82	27	10	5.2
19				2.1	1.7	1.6	2.1	53	52	26	10	8.2
20				2.1	1.7	1.6	3.2	824	62	8.0	6.7	4.7
21				2.1	1.9	1.6	2.2	128	71	18	6.7	4.7
22	±2			2.3	1.9	1.6	2.8	128	-73	13	8.7	5.2
23				2.3	1.9	1.7	3.6	27	70	21	7.3	6.0
24				2.4	1.9	1.7	4.1	26	77	17	6.8	7.3
25				2.4	1.9	1.7	4.5	20	70	16	8.0	7.0
26				2.4	1.9	1.7	4.7	16	66	18	5.2	6.2
27				2.3	1.9	1.7	4.8	15	47	*13	8.2	8.8
28				2.4	1.9	1.7	4.8	18	48	19	4.7	6.0
29				2.1	-	1.6	6.2	23	47	11	4.3	8.2
30	±2			2.4		*1.6	8.0	31	54	15	6.3	8.4
31				2.4		1.7		38		22	4.3	
Total	62.8	60	62	66.7	68.2	61.7	61.3	484.8	2,161	808.0	265.8	161.6
Mean	2.03	2	2	2.15	2.01	1.87	2.72	14.7	72.0	28.3	8.87	6.38
Ac-ft	128	119	122	132	121	105	161	902	4,290	1,900	527	320
Calendar year 1964: Max 81	Min -	Mean 8.60	Ac-ft 8,240									
Water year 1964-65: Max 120	Min -	Mean 12.0	Ac-ft 8,710									

* Discharge measurement made on this day.
 ± No gage-height record.
 † Stage-discharge relation affected by ice.

BEAR RIVER BASIN

10-115. Bear River near Utah-Wyoming State Line.

Location.--Lat 40°58', long 110°51', in SW 1/4 sec. 30, T.3 N., R.10 E., on left bank just downstream from West Fork, 2.8 miles upstream from Utah-Wyoming State line.

Drainage area.--176 sq. mi.

Records available.--July 1962 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 7,968 ft (from micro-profile map).

Average discharge.--63 years, 166 cfs (134,700 acre-ft per year).

Extremes.--Maximum discharge during year, 2,686 cfs June 12 (gage height, 3.52 ft); minimum, not determined, occurred during period of no gage-height record.

1942-68: Maximum discharge, 2,686 cfs June 12, 1968; minimum determined, 18 cfs Apr. 12, 1961, Nov. 5, 1964, Dec. 1, 1965, Oct. 30, 1966.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Two diversions above station for irrigation of about 200 acres each and 2,600 acres below station.

Discharge, in cubic feet per second, water year October 1964 to September 1968

Dec.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	37	<58	38	38	38	45	308	1,100	1,350	120	133
2	32	38	38	38	<38	41	390	1,040	1,360	989	126	126
3	32	38	38	38	40	38	40	420	1,080	1,330	238	128
4	32	<38	34	38	43	38	48	413	1,140	1,300	810	117
5	32	37	32	40	42	38	41	352	1,270	1,310	220	117
6	<32	33	32	40	42	40	38	262	1,380	1,270	262	118
7	32	34	32	40	40	40	40	312	1,380	1,200	214	120
8	32	38	32	40	38	40	37	382	1,310	<1,160	212	122
9	32	32	38	40	38	40	38	358	1,400	1,100	218	122
10	32	34	38	40	37	40	38	328	<1,380	1,000	208	123
11	32	30	38	40	36	40	38	332	2,130	1,040	212	122
12	32	29	34	38	37	40	38	338	2,330	1,040	226	120
13	32	28	32	34	37	39	38	328	2,280	838	228	111
14	32	32	32	<38	38	38	38	328	1,780	832	228	108
15	32	28	38	38	40	32	32	320	<1,300	888	228	<101
16	32	29	<38	34	41	32	42	308	1,600	684	200	129
17	32	30	38	32	42	38	50	424	1,330	788	208	134
18	32	31	37	31	42	38	56	<422	588	888	240	130
19	32	31	37	38	42	38	58	788	908	1,000	300	135
20	32	32	38	30	42	38	72	912	912	728	268	135
21	32	34	38	38	41	38	82	822	1,140	634	228	128
22	32	32	38	38	41	37	88	266	<1,320	878	228	130
23	32	32	31	32	41	32	108	308	1,580	802	222	132
24	34	36	38	37	41	38	108	788	1,610	608	232	176
25	34	38	41	38	40	38	100	648	1,610	482	212	176
26	34	32	38	37	40	38	98	<222	1,280	482	188	168
27	34	38	38	38	40	38	88	284	888	<484	170	169
28	32	38	37	38	40	38	<108	488	848	380	168	143
29	37	37	38	38	-	37	148	644	<528	374	188	148
30	38	37	32	38	-----	38	208	848	1,120	488	188	143
31	38	-----	38	38	-----	<31	-----	244	-----	888	<140	-----
Total	1,060	1,007	1,120	1,182	1,121	1,127	2,008	18,068	12,145	26,822	7,277	4,279
Mean	32.9	32.8	32.7	37.8	40.0	32.3	62.9	468	1,405	888	244	143
Ac-ft	2,080	2,000	2,200	2,500	2,420	2,280	2,960	26,280	16,580	62,610	12,000	8,480

Calendar year 1964: Max 1,680 Min - Mean 156 Ac-ft 134,200
 Water year 1964-68: Max 2,500 Min 28 Mean 256 Ac-ft 208,600

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-20	2100	2.70	1,160	6-12	2300	3.52	2,680

* Discharge measurement made on this gage.

Remarks.--No gage-height record Oct. 7 to Nov. 4. *Gage-discharge relation selected by 1964 Mar. 22-27, 28, Dec. 8-20, Dec. 27 to Jan. 11, Jan. 16-18, 20-22, 24-27, Feb. 1 to May. 12, Mar. 14, 16-21, 22-27.

BEAR RIVER BASIN

10-157. Sulphur Creek above reservoir, near Evanston, Wyo.

Location.--Lat 41°03', long 110°46', in SW¹/₄ sec.35, T.14 N., R.119 W., on right bank 1 1/2 miles downstream from Millon Creek, 2 miles upstream from Sulphur Creek Dam, and 1 1/2 miles southwest of Evanston.

Drainage area.--64 sq mi, approximately.

Records available.--December 1967 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 7,170 ft (from river-profile map).

Average discharge.--7 years (1965-68), 11.6 cfs (2,400 acre-ft per year).

Extremes.--Maximum discharge during year, 2,280 cfs Apr. 21 (gage height, 5.02 ft); no flow Oct. 1-5. 1967-68: Maximum discharge, that of Apr. 21, 1968; no flow at times in each year.

Remarks.--Records good except those for periods of ice effect, which are poor. Several diversions for irrigation above station.

Rating table, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 8 to Nov. 11)

1.3	0	2.1	11
1.4	.1	2.3	20
1.5	.3	2.7	43
1.6	.6	3.4	123
1.7	1.4	4.0	213
1.8	3.0	4.5	303
1.9	5.1	4.9	403

Discharge, in cubic feet per second, water year October 1964 to September 1968

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.2	(*)				20	145	170	11	21	2.6
2	0	.2			(*)		12	146	132	6.0	17	2.2
3	0	.2	3.8			(*)	10	132	121	6.0	4.8	2.2
4	0	.2					18	111	101	6.2	6.1	2.7
5	0	.2					23	108	107	6.7	3.8	2.9
6	*.1	.2		x7		6	21	89	106	8.4	3.2	1.0
7	.1	.2					18	70	90	8.9	3.2	1.2
8	.1	.2					16	87	94	8.9	3.0	1.2
9	.1	.2					14	80	77	8.6	2.8	3.2
10	.1	.2					13	88	83	7.8	3.0	3.0
11	.2	.2					12	37	289	5.1	3.0	7.2
12	.2	.2					12	45	182	4.8	2.8	5.3
13	.2	.2	3.0		7		12	108	141	4.8	4.8	4.8
14	.2	.2					12	213	86	4.7	5.2	3.4
15	.2	.2					20	235	*73	5.1	3.4	3.4
16	.2	.3				5	40	145	64	5.4	5.1	7.7
17	.2	.3					30	182	59	6.0	5.1	1.0
18	.2	.3					35	168	46	20	7.2	1.2
19	.2	.3					30	*182	36	35	12	1.2
20	.2	.3		8		8	239	207	23	32	23	1.2
21	.2	.5	4.0				*402	168	27	10	16	1.6
22	.2	.5	5.0				237	170	19	6.8	22	1.3
23	.2	.5	15				167	167	20	11	14	1.0
24	.2	.5	12				168	138	24	11	12	1.2
25	.2	.5	10				172	120	27	5.9	9.2	1.0
26	.2	2.0	8.0		6		191	101	32	6.6	7.2	3.5
27	.2	2.0	8.0		6		90	77	25	*6.8	4.2	7.7
28	.2	2.0	7.5		6		*76	75	19	8.2	5.1	8.0
29	.2	2.0	7.0		-		94	117	*17	5.4	4.0	9.9
30	.2	2.0	7.0				130	154	12	5.4	3.0	11
31	.2	7.0	7.0			(*)		164		33	*2.4	
Total	4.8	17.0	183.0	235	212	155	7,965	3,913	2,552	366.7	324.5	232.2
Mean	0.16	0.57	4.94	7.7	7.6	5	82.2	126	85.1	11.8	8.53	5.44
Ac-ft	9.5	34	303	572	422	307	4,590	7,760	3,070	727	526	502
Calendar year 1964	Max	145	Min	0	Mean	16.5	Ac-ft	12,170				
Water year 1964-68	Max	403	Min	0	Mean	28.0	Ac-ft	21,020				

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Apr. 19.

BEAR RIVER BASIN

10-159. Sulphur Creek below reservoir, near Evanston, Wyo.

Location.--Lat 41°08', long 110°49', in SE[SW] sec.28, T.14 N., R.118 W., on left bank 400 ft downstream from Sulphur Creek Dam, 6.3 miles upstream from mouth, and 10½ miles southeast of Evanston.

Drainage area.--88 sq mi, approximately.

Records available.--March 1958 to September 1965.

Gage.--Water-stage recorder and concrete V-notch control. Altitude of gage is 7,110 ft (from river-profile map).

Extremes.--Maximum discharge during year, 343 cfs June 11 (gage height, 4.96 ft); no flow for many days. 1958-59: Maximum discharge, that of June 11, 1965; no flow at times in each year.

Remarks.--Records good. Flow regulated by Sulphur Creek Reservoir (capacity, 7,100 acre-ft) enlargement completed November 1964. Records prior to 1965 do not include flow over spillway of the dam.

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	0	(*)			0	22	179	148	8.0	58	8.8
2	25	0			(*)	0	22	192	147	8.0	58	0
3	25	0				0	14	12	136	8.0	44	.2
4	25	0				0	14	12	134	8.0	53	.1
5	25	0				0	14	12	116	8.0	28	.2
6	*27	0		(*)		0	*14	12	113	8.0	20	.2
7	25	0				0	14	12	103	8.0	17	6.0
8	25	0				0	14	12	101	8.0	18	25
9	25	0				0	14	12	97	8.0	13	24
10	25	0				0	14	12	169	8.3	13	48
11	24	0				0	16	13	322	8.3	14	67
12	24	0				0	22	18	293	8.3	14	66
13	24	0				0	33	13	232	8.3	14	66
14	25	0				1.4	33	27	181	8.3	15	65
15	25	0				3.0	34	155	*144	8.3	14	64
16	22	0				3.0	23	207	117	8.5	14	63
17	22	0				3.0	34	181	108	8.8	14	62
18	21	0				3.0	34	178	106	8.1	14	62
19	20	0				3.0	35	*175	104	26	22	62
20	7.8	.1				3.0	35	192	97	52	38	62
21	.1	.1				3.0	*37	177	59	48	38	62
22	0	0				3.0	36	185	47	38	38	62
23	0	.1				3.0	161	186	41	34	34	61
24	0	.1				3.0	185	195	8.7	38	27	61
25	0	.1				3.0	228	167	8.7	30	22	60
26	0	0				3.0	265	145	7.3	28	17	60
27	0	0				3.0	253	124	6.8	26	14	60
28	0	0				6.3	*265	95	8.8	*27	12	58
29	0	.1				12	234	95	*6.8	24	10	58
30	0	.1				15	181	108	6.0	21	18	60
31	0	-----				13	-----	125	-----	34	+17	-----
Total	481.9	0.7	0	0	0	86.7	2,310	3,208	3,158.5	528.4	705	1,355.5
Mean	15.5	0.02	0	0	0	2.76	77.0	104	105	17.1	22.8	45.2
Ac-ft	956	1.4	0	0	0	170	4,580	6,380	8,260	1,050	1,400	2,690

Calendar year 1964: Max 100 Min 0 Mean 24.7 Ac-ft 17,910
 Water year 1964-65: Max 322 Min 0 Mean 32.4 Ac-ft 33,470

* Discharge measurement or observation of no flow made on this day.

BEAR RIVER BASIN

10-195. Chapman Canal at State Line, near Evanston, Wyo.

Location.--Lat 41°24', long 111°02', in SE¹/₄ sec.36, T.17 N., R.121 W., on left bank at highway bridge, 6¹/₂ miles downstream from headgates and 10 miles northwest of Evanston.

Records available.--April 1962 to September 1965 (prior to October 1944 irrigation seasons only). Monthly discharge only for some periods, published in MSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 8,870 ft (from river-profile map). Prior to Oct. 11, 1946, staff gage and Oct. 11, 1946, to Aug. 2, 1961, water-stage recorder at site 20 ft downstream at same datum.

Average discharge.--21 years (1944-65), 16.1 cfs (13,630 acre-ft per year).

Extremes.--1942-65: Maximum daily discharge, 133 cfs June 16, 1964; no flow at times each year.

Remarks.--Records good except those for period of ice effect, which are poor. Canal diverts water from Bear River in NW¹/₄ sec.36, T.16 N., R.121 W. Many diversions above station for irrigation in Wyoming. Flow at station is for storage in Neponset Reservoir, Utah, and irrigation in Salaratus basin, Utah.

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.2	34	82	0	**2	0	35	26	37	72	73	3.0
2	.7	37	*30	0	0	*0	35	28	58	74	23	3.0
3	.4	*20	42	0	0	0	40	28	54	73	23	3.0
4	.1	19	48	0	0	0	48	26	35	67	21	2.6
5	*0	15	28	*0	0	0	38	26	44	72	18	2.0
6	0	18	8	0	0	0	45	27	64	72	17	2.8
7	.7	19	0	0	0	0	*25	25	65	75	16	2.9
8	.2	16	0	0	0	0	43	23	70	75	16	2.8
9	.3	14	0	0	0	0	48	22	76	68	14	2.4
10	1.4	28	0	0	0	0	45	22	75	64	14	2.0
11	2.6	30	0	0	0	0	42	21	85	60	12	1.6
12	3.0	28	0	0	0	0	39	20	86	56	13	2.6
13	2.8	28	0	0	0	0	39	20	86	*55	11	2.4
14	4.5	29	0	0	0	0	39	21	65	85	9.7	2.1
15	5.1	30	0	0	0	0	38	26	88	49	9.7	2.1
16	6.6	31	0	0	0	0	42	28	*85	51	10	1.8
17	13	32	0	0	0	0	48	37	92	59	10	1.4
18	17	35	0	0	0	0	50	25	66	65	3.7	1.4
19	18	34	0	0	0	0	51	32	35	108	12	2.4
20	19	35	0	0	0	0	55	48	28	91	13	1.3
21	16	36	0	0	0	0	*50	74	41	68	12	2.1
22	11	37	0	0	0	0	63	96	86	60	16	.9
23	9.7	38	3	0	0	0	60	102	64	58	17	.6
24	12	39	7	0	0	0	62	88	109	55	13	.6
25	10	40	10	0	0	0	60	60	123	53	6.4	.5
26	9.7	41	6	0	0	0	38	*37	127	*59	5.6	.6
27	8.7	42	3	0	0	0	48.6	29	97	54	5.6	.6
28	10	43	1	0	0	0	28	24	65	66	8.3	1.4
29	9.7	43	0	0	-	5	25	20	77	45	4.5	.7
30	10	*43	0	0	-	8	25	20	*70	41	*4.3	.4
31	12	-----	0	5	-----	*10	-----	22	-----	38	-----	-----
Total	219.5	855	254	5	3	25	1,895.8	1,301	2,193	1,966	456.2	48.0
Mean	7.08	29.8	8.2	0.2	0.1	0.8	43.2	39.5	72.8	63.4	14.1	1.85
Ac-ft	435	1,790	504	10	6	50	2,570	2,160	4,330	3,900	665	61

Calendar year 1964: Max 133 Min 0 Mean 24.5 Ac-ft 17,700
 Water year 1964-65: Max 127 Min 0 Mean 23.1 Ac-ft 16,720

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day (less than 0.1 cfs Oct. 5).

Note.--Stage-discharge relation affected by ice Nov. 14 to Apr. 6 (no gage-height record Mar. 27 to Apr. 6).

BEAR RIVER BASIN

10-201. Bear River above reservoir, near Woodruff, Utah

Location.--Lat 41°36'05" N, long 111°01'00" W. In NW¼ sec. 25, T.17 N., R.12C W., in opening on right bank 9.5 miles upstream from Woodruff Reservoir Dam and 10 miles southeast of Woodruff.

Drainage area.--780 sq mi, approximately.

Records available.--October 1961 to September 1965.

Gage.--Water-stage recorder. Altitude of gage is 6,455 ft (from river-profile map).

Extremes.--Maximum discharge during year, 3,340 cfs June 13, 14 (gage height, 5.95 ft); minimum, 1.4 cfs Oct. 7, 1961-65; Maximum discharge, unit of June 13, 14, 1965; minimum, 0.1 cfs Aug. 24, 1964.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 10,000 acres above station.

Rating table, except periods of ice effect (gage height,
in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 20 to Sept. 30)

0.8	0.4	1.6	82	4.3	1,480
1.0	2.3	2.1	170	5.0	1,820
1.1	6.0	2.8	318	5.5	2,200
1.2	12	3.0	548	5.7	2,300
1.6	45	4.0	1,130	5.9	3,400

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	5.2	*28	120	100	78	320	844	1,820	928	824	*128
2	1.7	8.0	29	122	*102	*72	380	940	1,670	1,070	757	120
3	1.7	5.6	27	125	105	70	335	874	1,620	1,080	398	101
4	1.5	*6.0	27	120	105	72	358	790	1,300	1,060	343	99
5	1.7	5.6	27	*120	105	72	322	754	1,270	1,060	288	80
6	1.7	5.6	22	118	108	74	*302	863	1,620	1,010	858	120
7	*1.4	7.3	22	115	102	75	335	533	1,730	378	234	224
8	1.7	8.6	26	110	100	75	322	534	1,750	378	227	234
9	2.3	6.6	70	100	88	75	322	490	1,850	844	302	164
10	2.3	8.2	72	86	92	75	298	443	2,010	754	180	160
11	2.7	12	70	86	85	75	254	400	*2,260	722	128	188
12	3.8	14	88	88	82	75	227	327	2,350	710	*125	163
13	4.2	12	88	84	80	75	221	410	*2,380	*678	176	176
14	4.2	11	70	84	80	75	227	513	*2,380	533	161	164
15	3.4	13	72	82	80	75	227	518	2,450	524	161	161
16	2.7	18	70	80	80	75	281	558	2,140	478	173	180
17	2.1	12	68	80	82	75	356	552	2,010	462	171	221
18	2.1	18	88	88	84	75	337	1,200	1,840	534	180	234
19	4.2	15	70	88	88	75	400	1,270	1,440	1,080	216	234
20	4.5	18	72	66	88	75	*760	1,410	1,250	916	306	261
21	4.2	20	72	88	88	75	1,030	863	1,150	619	281	258
22	4.8	*21	72	88	88	75	1,040	1,210	1,250	302	388	281
23	3.8	*22	80	88	88	75	822	1,840	1,320	478	358	281
24	3.4	*23	160	80	88	75	576	1,660	1,500	452	281	277
25	3.0	*23	200	80	88	75	522	*1,520	1,580	418	242	258
26	3.4	*23	180	82	88	75	822	1,270	1,780	398	205	288
27	3.0	*23	170	92	88	75	576	1,000	1,340	382	208	273
28	3.0	*24	270	94	82	75	*744	890	968	*331	173	288
29	3.4	*27	180	86	88	75	100	718	892	888	288	261
30	4.5	*28	180	96	88	75	180	758	1,050	*850	254	244
31	4.9	-----	140	88	-----	250	-----	1,300	-----	325	141	273
Total	94.0	445.9	2,655	3,087	2,814	2,886	18,518	29,551	51,734	20,865	7,405	6,241
Mean	3.03	14.9	85.8	82.6	83.6	83.4	617	266	1,724	673	229	208
ac-ft	196	584	5,270	6,120	4,890	5,130	30,750	58,810	102,000	31,330	14,880	12,330
Calendar year 1964:	Max 1,950	Min 0.2	Mean 222	Ac-ft 181,100								
Water year 1964-65:	Max 2,950	Min 1.4	Mean 391	Ac-ft 268,200								

* Discharge measurement made on this day.

2 No gage-height record.

Note.--Stage-discharge relation affected by ice Dec. 8 to Apr. 1 (no gage-height record Jan. 8-23, Feb. 2 to Mar. 2).

BEAR RIVER BASIN

10-203. Bear River below reservoir, near Woodruff, Utah

Location.--Lat 41°30'20", long 111°00'50", in NW¼ sec.32, T.16 N., R.120 W., in Wyoming, on right bank, 1,100 ft below Woodruff Narrows Dam, 1.6 miles upstream from Salt Creek, 8.4 miles upstream from Wyoming-Utah State line, and 7.7 miles east of Woodruff.

Drainage area.--810 sq mi, approximately.

Records available.--October 1961 to September 1965.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 6,400 ft (from river-profile map). Prior to Sept. 26, 1962, at site 178 ft upstream at same datum.

Extremes.--Maximum discharge during year, 3,000 cfs June 14 (gage height, 7.26 ft); minimum daily, 6.0 cfs Oct. 11-19, Nov. 16-23, Dec. 2, 3.

1961-65: Maximum discharge, that of June 14, 1965; no flow July 4, 8, 1962.

Remarks.--Records excellent. Flow regulated by Woodruff Narrows Reservoir beginning January 1962 (capacity, 25,000 acre-ft). Diversions for irrigation of about 45,500 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31		Apr. 1 to Sept. 30	
2.7	5.2	3.8	100
2.8	13	4.0	133
3.2	32	4.5	286
3.8	100	5.0	440
4.8	257	6.0	1,010
4.7	325	7.0	1,880
		7.8	3,030

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	8.3	8.3	16	18	20	304	852	1,150	619	351	130
2	12	8.3	8.3	17	18	20	304	852	1,150	743	423	128
3	11	8.3	8.3	17	18	20	304	852	1,150	908	423	118
4	8.3	8.3	8.3	17	18	20	304	852	1,470	964	390	105
5	*9.3	8.3	8.3	17	18	20	304	749	1,410	978	340	102
6	8.5	8.3	10	17	18	20	*304	824	1,430	978	284	114
7	8.6	8.6	14	18	19	20	304	419	1,810	958	256	146
8	8.3	8.6	14	18	19	20	304	257	1,830	958	256	164
9	8.4	8.6	14	18	19	20	304	257	1,720	906	273	158
10	8.3	8.6	14	18	19	20	304	301	1,660	822	184	178
11	8.0	8.6	15	18	19	20	304	301	*2,070	758	167	167
12	8.0	8.6	15	18	19	20	304	301	2,320	713	148	163
13	8.0	8.6	15	18	19	48	321	301	2,640	877	146	158
14	8.0	8.6	15	18	19	116	376	304	*2,840	830	148	180
15	8.0	8.6	15	18	19	118	376	304	2,320	878	144	194
16	8.0	8.0	15	18	19	118	374	307	2,640	818	146	144
17	8.3	8.0	15	18	19	148	427	472	2,360	476	144	148
18	8.3	8.0	14	18	19	178	560	630	2,020	418	141	167
19	8.3	8.0	15	18	19	179	560	630	1,560	581	153	179
20	8.3	8.0	15	18	19	176	*560	624	1,280	534	198	194
21	8.3	8.0	15	18	19	176	560	1,050	1,020	761	258	210
22	8.3	8.0	15	18	19	178	638	1,330	907	647	264	210
23	8.6	8.0	15	18	19	178	788	1,360	1,120	686	301	216
24	8.6	8.3	16	18	19	178	788	1,330	1,350	503	297	221
25	8.6	8.3	16	18	20	196	848	*1,400	1,480	472	268	230
26	8.6	8.3	16	18	20	242	964	1,380	1,520	432	233	239
27	8.3	8.3	16	18	20	242	858	1,080	1,470	402	210	239
28	8.3	8.3	16	18	20	238	852	886	1,120	362	182	230
29	8.3	8.3	16	18	-	281	*852	803	845	323	163	224
30	8.3	8.3	16	18	-----	302	852	761	*852	287	143	221
31	8.6	-----	18	19	-----	302	852	886	862	362	137	-----
Total	273.3	249.3	430.9	551	531	3,796	15,581	23,068	50,448	20,092	7,086	8,248
Mean	8.82	8.31	13.8	17.8	19.0	122	519	744	1,052	648	225	175
Ac-ft	542	494	855	1,090	1,650	7,330	30,360	45,730	100,100	36,880	14,080	10,410

Calendar year 1964: Max 2,080 Min 1.0 Mean 220 Ac-ft 139,800

Water year 1964-65: Max 2,360 Min 6.0 Mean 349 Ac-ft 252,600

* Discharge measurement made on this day.

BEAR RIVER BASIN

10-265. Bear River near Randolph, Utah

Location.--Lat 41°18', long 111°05', in SHIMED sec.7, T.12 N., R.8 E., on left bank 3.6 miles upstream from Twin Creek, 4.8 miles upstream from Utah-Speming State line, and 11 miles northeast of Randolph.

Drainage area.--1,840 sq mi, approximately.

Records available.--October 1943 to September 1965. Monthly discharge only for some periods, published in WSP 1914.

Gage.--Water-stage recorder. Altitude of gage is 6,205 ft (from river-profile map).

Average discharge.--28 years, 182 cfs (131,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,400 cfs June 17 (gage height, 8.99 ft); minimum daily, 9.7 cfs Oct. 1-18.

1943-65: Maximum discharge, 2,660 cfs May 8, 1952 (gage height, 8.80 ft); minimum, 1.6 cfs Nov. 12, 1961.

Remarks.--Records good except those few periods of ice effect, which are fair. Dimensions for irrigation of about 24,000 acres above station. Flow regulated by Woodruff Narrows Reservoir beginning January 1962 (capacity 24,000 acre-ft).

Rating table, except periods of ice effect (gage height,
in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 1 to May 7, June 8 to July 1, July 10-24)

1.6	5.1	3.0	136	7.0	1,290
1.8	13	4.0	370	8.0	1,848
2.0	48	5.0	802	8.8	2,450
2.5	108	6.0	865		

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.7	40	46	60	*80	82	674	664	888	1,140	418	*206
2	9.7	42	44	60	88	82	845	888	888	884	411	181
3	9.7	*42	48	60	66	*82	899	898	827	631	462	161
4	9.7	43	46	*60	88	82	868	802	1,020	886	485	160
5	9.7	44	44	60	84	80	866	923	1,180	874	671	142
6	9.7	44	46	60	83	78	839	850	1,300	620	439	184
7	*9.7	44	44	60	82	79	*820	897	1,380	880	398	184
8	9.7	44	44	60	81	78	454	778	1,380	888	364	208
9	9.7	44	48	60	79	80	490	818	1,320	673	324	208
10	9.7	45	50	60	78	80	466	854	1,380	670	302	208
11	9.7	48	60	60	77	80	468	496	1,440	629	266	215
12	9.7	47	50	60	77	80	466	468	1,600	820	271	213
13	9.7	48	60	60	76	82	448	488	1,620	*610	280	213
14	9.7	48	50	60	75	84	441	448	*1,280	882	284	212
15	9.7	48	50	60	75	85	457	418	2,060	886	288	208
16	9.7	48	60	60	74	85	466	312	2,220	844	280	212
17	9.7	48	60	60	74	120	489	218	2,380	866	218	213
18	9.7	48	60	60	74	170	443	178	2,370	610	213	215
19	16	48	60	60	75	175	508	132	2,780	881	217	220
20	27	48	60	60	78	230	888	133	2,060	618	223	226
21	35	60	61	62	78	267	881	167	1,840	787	287	241
22	38	60	62	63	90	*289	*888	167	1,870	889	280	284
23	32	60	54	64	90	267	889	340	*1,340	684	282	273
24	32	65	60	64	62	257	880	884	1,100	788	304	275
25	32	81	70	64	82	281	708	887	988	708	322	278
26	33	46	74	68	82	241	728	*737	1,060	*686	312	280
27	35	47	76	68	82	288	764	818	1,220	618	296	284
28	36	48	75	68	82	281	812	902	1,310	878	269	286
29	37	60	70	72	82	306	889	833	1,380	884	285	286
30	35	*82	66	80	82	360	884	683	1,380	488	284	284
31	38	-----	63	86	-----	443	-----	882	-----	450	220	-----
Total	602.8	1,328	1,663	1,982	2,227	3,220	17,288	17,734	48,678	20,207	9,400	8,722
Mean	19.4	48.2	53.6	63.0	78.3	108	578	572	1,483	638	303	224
Ac-ft	1,700	2,780	3,500	3,870	4,440	10,380	34,290	38,170	87,080	40,080	18,640	13,330
Calendar year 1964: Max	1,700	Min	9.7	Mean	168	Ac-ft	120,100					
Water year 1964-65: Max	2,370	Min	9.7	Mean	351	Ac-ft	284,400					

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14-19, 28, 29, Dec. 5 to Mar. 20.

BEAR RIVER BASIN

10-285. Bear River below Pixley Dam, near Cokeville, Wyo.

Location.--Lat 41°56'20", long 110°55'05", in SE1/4 sec.25, T.23 N., R.170 W., 600 ft downstream from Pixley Dam, 11 miles south of Cokeville, and 17.5 miles downstream from Twin Creek.

Drainage area.--2,040 sq mi, approximately.

Records available.--October 1941 to November 1943 (published as Bear River near Cokeville), October 1982 to September 1986, May 1988 to September 1988 (irrigation seasons only). Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 8,168 ft (from river-profile map). Oct. 31, 1941, to Nov. 30, 1943, at site 200 ft downstream at different datum.

Average discharge.--3 years (1941-43, 1982-88), 137 cfs (82,180 acre-ft per year).

Extremes.--Maximum discharge during season, 1,430 cfs June 18 (gage height, 8.61 ft); maximum gage height, 8.54 ft June 19 (backwater from return flow); minimum daily discharge, 23 cfs May 19. 1941-43, 1982-86, 1988-88: Maximum daily discharge, 2,300 cfs Mar. 25, 1988; minimum daily recorded, 0.3 cfs Aug. 21, 1981.

Remarks.--Reeds good. Natural flow of stream affected by diversions for irrigation and return flow from irrigated areas. No diversion between station and Colletts Creek Branch of Snake Park.

Discharge, in cubic feet per second, May to September 1988												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20							858	318	1,040	487	*222
2	22							863	202	1,230	427	215
3	22							878	327	1,070	441	198
4	22							886	361	851	479	178
5	22							888	437	725	281	170
6	22							900	839	725	461	154
7	*22							900	712	782	427	248
8	-							878	903	782	398	221
9	-							809	614	*740	363	258
10	-							878	943	735	352	251
11	-							803	*828	705	316	234
12	-							839	923	878	362	240
13	-							469	653	648	237	224
14	-							487	*884	*638	229	257
15	-							438	998	814	288	222
16	-							321	1,140	884	240	230
17	-							170	1,210	884	258	254
18	-							29	1,380	628	222	238
19	-							23	1,400	838	273	237
20	-							29	1,330	821	249	243
21	-							28	1,220	670	250	258
22	-							27	1,110	750	271	279
23	-							28	*872	605	283	300
24	-							54	908	815	306	310
25	-							141	882	768	384	313
26	-							222	606	705	331	311
27	-							*306	738	658	316	316
28	-							402	828	618	254	318
29	-							*220	410	878	*577	277
30	-							830	339	*888	839	283
31	-							351	436	436	246	-----
Total								15,972	28,475	22,342	10,091	7,821
Mean								451	662	721	326	251
Ac-ft								27,710	52,510	44,350	20,020	14,220
Calendar year	: Max		Min		Mean		Ac-ft					
The season	: Max	-	Min	-	Mean	-	Ac-ft	189,500				

* Discharge measurement made on this day.

BEAR RIVER BASIN

10-320. Smiths Fork near Border, Wyo.

Location.--Lat 42°17', long 110°42', in NW¼ sec.32, T.27 N., R.113 W., on left bank ½ mile upstream from Howland Creek, 6 miles downstream from Hobble Creek, and 12 miles northeast of Border.

Drainage area.--165 sq mi.

Records available.--May 1942 to September 1965.

Gage.--Water-stage recorder. Altitude of gage is 8,850 ft (from topographic map). Prior to Oct. 16, 1948, at site 0.5 mile downstream at different datum.

Average discharge.--23 years, 190 cfs (139,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,350 cfs June 13 (gage height, 4.42 ft); minimum, 40 cfs Mar. 26, 1942-cfs. Maximum discharge, 1,800 cfs June 7, 1957 (gage height, 4.56 ft); minimum recorded, 35 cfs Mar. 21, 1955, result of freezeup.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. One diversion for irrigation of about 200 acres above station.

Rating table, except periods of ice effect (gage height, in feet,
and discharge, in cubic feet per second)

1.8	58	3.0	471
1.8	83	4.0	1,060
2.2	169	4.4	1,340
2.7	348		

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	50	75	175	70	88	*72	218	890	787	253	161
2	51	52	*78	175	172	168	70	239	820	609	276	*183
3	59	50	75	175	171	168	83	239	840	737	268	180
4	58	79	74	175	*170	*168	86	200	880	772	261	180
5	58	*79	175	164	170	168	88	208	863	759	*257	180
6	58	79	170	168	69	168	88	203	891	754	246	205
7	58	78	168	168	168	168	88	234	1,010	738	243	175
8	*58	78	168	168	168	168	88	*200	1,080	625	238	175
9	58	75	171	168	168	168	83	232	1,070	667	232	164
10	58	80	174	162	168	65	88	253	1,050	650	229	183
11	58	78	174	160	168	168	85	253	1,080	621	225	150
12	50	78	174	160	168	168	88	239	1,100	589	222	183
13	58	78	174	78	168	168	88	280	1,210	587	225	180
14	58	76	172	75	168	88	85	276	1,280	537	219	147
15	58	175	172	*74	168	83	82	210	1,170	617	216	180
16	58	175	172	174	168	64	88	286	1,120	603	209	164
17	58	78	170	174	168	64	84	716	1,080	489	209	180
18	58	178	168	174	168	64	23	723	288	489	209	185
19	58	178	170	174	168	164	102	746	282	467	202	145
20	53	78	174	170	168	183	126	783	382	484	212	162
21	53	178	175	168	168	162	147	734	591	484	209	142
22	52	178	160	168	167	82	212	700	1,020	400	219	140
23	52	178	160	168	167	62	314	603	1,020	386	206	137
24	52	78	113	163	167	163	316	750	1,020	370	196	137
25	50	78	73	160	167	163	337	716	1,040	378	180	135
26	50	78	88	168	166	163	418	679	1,040	352	184	133
27	50	86	83	168	88	82	399	*844	578	337	178	130
28	50	88	88	88	88	80	484	610	890	326	178	125
29	50	79	152	80		82	*482	850	818	*314	169	123
30	57	78	161	88		83	512	8700	730	310	168	128
31	52	-----	173	82	-----	68	-----	890	-----	238	164	-----
Total	2,848	2,314	2,422	2,242	1,890	1,480	5,340	18,892	30,480	16,525	6,781	4,477
Mean	68.4	78.1	78.3	72.3	67.5	64.2	178	609	1,016	533	218	149
Ac-ft	1,250	1,850	1,610	1,450	1,270	1,050	10,580	37,470	60,450	32,786	13,410	5,880

Calendar year 1964: Max 1,130 Min - Mean 207 Ac-ft 150,000
 Water year 1964-65: Max 1,310 Min 58 Mean 283 Ac-ft 190,500

- * Discharge measurement made on this day.
- † No gage-height record.
- ‡ Stage-discharge relation affected by ice.

BEAR RIVER BASIN

10-327. Muddy Creek above Mill Creek, near Cokeville, Wyo.

Location.--Lat 42°11'36", long 110°45'55", in S½ sec.31, T.28 N., R.118 W., on right bank, one-third mile up-stream from Mill Creek, 12 miles upstream from mouth, and 8 miles northeast of Cokeville.

Drainage area.--26.7 sq mi.

Records available.--October 1964 to September 1965.

Gage.--Water-stage recorder, and sharp-crested trapezoidal weir. Altitude of gage is 8,490 ft (from topographic map).

Extreme.--Maximum discharge during year, 136 cfs Apr. 30 (gage height, 3.77 ft); minimum recorded, 0.7 cfs several days.

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

Rating table, except period of ice effect (gage height,
in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 8 to Sept. 2, Sept. 14-30)

0.5	0.4	1.5	20
.4	.8	2.0	28
.5	1.8	2.5	37
.7	3.8	3.0	51
1.0	6.8	3.5	103

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			31.0	2.4	36	1.3	*4.7	2.01	51	39.2	5.1	1.7
2			1.0	1.8	24	1.3	14	50	50	37.0	3.0	*1.0
3			1.0	1.9	36	1.3	12	19	28	38.7	3.8	1.0
4			1.0	1.4	34	1.2	16	77	*27	38.0	3.8	1.0
5			1.0	1.6	3.7	1.2	13	78	28	37.7	3.2	1.0
6			1.0	1.3	3.2	1.2	13	56	28	37.8	1.8	3.1
7			1.0	1.4	2.7	1.2	12	47	28	37.0	1.2	5.5
8			.8	1.4	2.6	1.2	11	52	21	37.0	1.2	4.6
9			.8	1.4	2.3	1.2	12	48	24	*6.2	1.0	3.6
10			.7	1.4	2.0	1.2	9.6	40	23	6.2	1.0	2.8
11			.8	1.4	1.8	1.2	10	37	*23	5.8	1.1	1.6
12			.8	1.3	1.7	1.2	8.3	39	21	5.8	1.2	1.7
13			.8	1.3	1.6	1.2	7.8	45	21	5.2	1.4	1.8
14			.8	1.2	1.5	1.2	7.4	43	20	5.0	1.4	1.4
15			.8	*1.2	1.5	1.2	7.8	51	19	4.8	1.0	1.9
16		31	.8	1.2	1.4	1.2	11	52	20	4.7	1.0	6.5
17			.8	1.2	1.4	1.2	12	53	20	4.8	1.2	6.2
18			.8	1.1	1.3	1.2	12	48	18	6.2	1.0	4.2
19			.8	1.1	1.4	1.2	24	47	18	5.3	2.2	4.4
20			.8	1.0	1.4	1.2	21	*48	14	5.2	2.2	3.7
21			.8	1.0	1.4	1.2	71	48	13	4.4	1.9	3.7
22			1.3	1.0	1.4	1.2	37	44	12	4.0	2.4	3.2
23			1.0	1.0	1.4	1.2	*33	42	12	4.0	2.2	2.7
24			38	1.0	1.4	1.2	78	40	12	3.7	2.4	2.3
25			27	1.0	1.3	1.2	65	37	10	4.0	1.7	2.2
26			4.2	1.0	1.3	1.2	81	35	18	4.2	1.4	1.8
27			3.2	1.0	1.3	1.2	69	34	16	3.7	1.4	1.4
28			3.0	.9	1.3	1.2	73	32	12	3.4	1.3	1.2
29			2.6	1.6	-	1.3	*76	30	10	*3.2	1.1	1.2
30			2.4	1.3	-	1.5	84	30	8.6	3.1	1.3	1.3
31			2.6	1.7	-	2.3	-	30	-	3.4	1.0	-
Total	31	30	52.1	47.7	60.3	39.2	1,080.4	1,522	588.6	170.4	10.4	37.7
Max	1	1	2.04	2.53	2.15	1.28	35.0	48.3	12.7	8.50	1.33	2.32
Ac-ft	61	60	128	58	120	78	2,140	3,030	1,170	333	100	174

Calendar year 1964: Max - Min - Mean - Ac-ft -
 Water year 1964-65: Max 101 Min - Mean 10.4 Ac-ft 7,190

* Discharge measurement made on this day.
 † No gage-height record.
 ‡ Stage-discharge relation affected by ice.

BEAR RIVER BASIN

10-395. Bear River at Border, Wyo.

Location.--Lat 42°11', long 111°03', in NE¼ sec. 16, T.14 S., R. 4E E., in Idaho, on left bank a quarter of a mile west of Wyoming-Idaho State line, half a mile west of Border, and 2.1 miles upstream from Thomas Fork.

Drainage area.--6,980 sq mi, approximately.

Records available.--October 1937 to September 1965.

Gage.--Water-stage recorder. Datum of gage is 6,051.83 ft above mean sea level, unadjusted.

Average discharge.--28 years, 384 cfs (856,200 acre-ft per year).

Extremes.--Maximum discharge during year, 3,240 cfs June 5 (gage height, 6.73 ft); minimum, 104 cfs Oct. 9, 1957-58; Maximum discharge, 3,680 cfs May 11, 1952 (gage height, 6.26 ft); minimum daily, 30 cfs Aug. 18-22, 1940.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions for irrigation of about 122,000 acres above station.

Rating table, except periods of ice effect (gage height,
in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 20 to July 7)

1.2	95	4.0	870
1.5	144	5.0	1,700
2.2	281	6.0	3,010
3.0	484	8.3	3,300

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	128	128	237	225	268	276	1,090	1,800	1,450	2,020	783	418
2	127	178	*203	225	218	170	1,350	1,620	1,380	2,030	770	*358
3	129	178	188	225	220	170	1,370	1,700	1,380	2,060	697	369
4	128	171	184	225	*220	*180	1,410	1,780	1,420	1,970	697	358
5	128	*189	168	225	220	180	1,200	1,790	1,610	1,740	708	358
6	128	168	158	*218	230	180	1,300	1,950	1,700	1,580	654	436
7	128	178	178	218	230	180	1,020	1,780	1,750	1,520	658	408
8	*118	178	178	210	220	180	*872	1,700	1,850	1,580	632	532
9	104	164	170	208	230	180	818	1,610	2,050	*1,470	698	408
10	127	162	178	208	225	180	872	1,450	2,140	1,420	661	450
11	108	190	168	200	210	180	820	1,280	2,180	1,280	517	470
12	111	166	170	203	210	180	778	1,160	2,200	1,300	502	461
13	127	194	170	198	200	188	761	1,180	2,210	1,240	490	458
14	126	184	158	200	210	180	754	1,130	2,270	1,280	458	458
15	127	170	180	200	200	200	747	1,200	*2,370	1,250	441	447
16	127	160	155	200	205	205	738	1,240	2,390	1,110	530	481
17	120	158	150	200	200	205	730	1,230	2,470	1,080	419	464
18	128	178	148	198	200	215	738	1,160	2,580	1,110	416	482
19	128	180	140	180	200	230	722	1,110	2,710	1,140	358	447
20	118	160	140	180	190	250	788	1,120	2,860	1,120	487	444
21	127	188	148	188	190	290	864	1,130	3,180	1,080	470	447
22	126	170	170	188	190	340	860	1,130	*3,240	1,000	490	458
23	144	188	360	190	180	350	1,080	1,080	2,720	1,130	614	472
24	146	190	368	198	178	340	1,130	1,130	2,180	1,160	823	378
25	144	198	370	190	170	340	1,160	1,160	3,060	1,160	828	470
26	150	200	360	188	170	360	1,270	1,280	3,030	1,130	838	467
27	153	188	350	188	170	368	1,320	*1,380	2,960	1,020	830	467
28	160	178	350	180	170	380	1,380	1,480	2,840	958	508	467
29	164	188	360	178	-	430	1,380	1,480	2,350	*898	494	484
30	147	168	270	190	-----	520	*1,440	1,420	2,180	860	458	467
31	171	-----	250	210	-----	700	-----	1,480	-----	828	484	-----
Total	4,022	8,447	6,888	6,220	5,688	8,215	21,280	42,590	70,040	40,460	16,848	13,871
Mean	128	183	218	201	202	268	1,042	1,374	2,335	1,305	542	462
Ae-ft	6,120	10,800	13,220	12,340	11,240	16,260	62,000	84,480	138,500	80,280	33,710	28,220
Calendar year 1964: Max 1,280 Min - Mean 388 Ae-ft 288,800												
Water year 1964-65: Max 3,240 Min 104 Mean 688 Ae-ft 488,000												

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-28, Dec. 9 to Mar. 31.

BEAR RIVER BASIN

10-460. Rainbow inlet canal near Dingle, Idaho

Location.--Lat 42°13'00", long 111°17'30", in SE1/4 sec. 3, T.14 S., R. 34 E., on left bank 1 1/2 miles west of Dingle and 1-3/4 miles downstream from benchmarks at Stewart Dam.

Records available.--January 1922 to September 1923. Monthly discharge only prior to October 1923, published in WSP 1013.

Gage.--Water-stage recorder. Altitude of gage is 5,060 ft. (from topographic map). Prior to Oct. 1, 1923, at site 300 ft. downstream at different datum. Oct. 1, 1923, to Oct. 23, 1924, to site half a mile downstream at different datum.

Average discharge.--43 years, 307 cfs (222,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,800 cfs June 28 (gage height, 7.37 ft); minimum daily, 65 cfs Oct. 1, 1922-23; Maximum discharge, 4,180 cfs Mar. 7, 1922 (gage height, 6.68 ft); minimum daily, 1 cfs on several days in 1921, 1924, 1940, 1945.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made three to six times a week. Canal diverts from Bear River at Stewart Dam in NE1/4 sec. 31, T. 13 S., R. 34 E., for storage in Bear Lake. At times flow in canal is augmented by surplus water from Blackfoot Slough entering at the station and by seepage and wastage from irrigation lands on both sides of canal.

Cooperation.--Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1924 to September 1925

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	96	122	201	250	220	242	680	1,700	1,400	2,250	2,200	450
2	122	126	208	270	228	158	1,320	1,840	1,450	2,270	2,200	450
3	122	127	208	230	220	158	1,680	1,910	1,450	1,970	2,200	450
4	122	127	210	224	230	158	1,220	2,010	1,420	1,950	2,200	450
5	120	129	190	223	222	155	1,480	2,030	1,380	1,940	2,200	450
6	120	124	190	250	238	155	1,340	2,120	1,460	1,920	2,200	450
7	120	122	108	238	238	155	1,240	2,220	1,350	1,810	2,200	450
8	122	201	128	222	228	155	1,180	2,250	1,400	1,460	2,200	450
9	122	200	122	219	228	155	1,100	2,170	1,280	1,460	2,200	450
10	127	203	128	222	230	150	1,060	2,100	1,210	1,370	2,200	450
11	116	201	184	201	230	150	1,000	2,250	1,200	1,220	2,200	450
12	124	201	180	201	223	150	940	1,390	1,220	1,190	2,200	450
13	124	201	170	183	220	135	810	1,200	1,020	1,250	2,200	450
14	122	125	160	203	215	200	820	1,200	1,000	1,000	2,200	450
15	122	129	155	210	210	200	810	1,200	1,070	1,020	2,200	450
16	122	206	125	212	210	230	825	1,280	2,130	1,320	2,200	450
17	122	219	125	212	208	230	825	1,250	2,200	1,000	2,200	450
18	124	180	22	197	212	225	825	1,200	2,200	1,040	2,200	450
19	122	175	27	180	202	220	872	1,200	2,270	1,100	2,200	450
20	122	201	108	193	210	220	825	1,200	2,310	1,100	2,200	450
21	141	176	114	180	201	270	836	1,430	2,370	1,040	2,200	450
22	141	124	143	189	201	270	1,070	1,420	2,430	1,020	2,200	450
23	147	121	208	132	200	228	1,120	1,390	2,210	1,040	2,200	450
24	127	123	275	162	192	302	1,320	1,340	2,700	1,660	2,200	450
25	122	203	221	222	182	300	1,320	2,220	2,740	1,220	2,200	450
26	121	202	223	182	190	325	1,420	1,200	2,270	1,220	2,200	450
27	122	197	220	190	122	320	1,220	1,200	2,270	1,220	2,200	450
28	122	127	224	184	121	321	1,200	1,200	2,700	925	2,200	450
29	172	122	220	172	-	327	1,220	1,200	2,220	925	2,200	450
30	122	203	273	222	-	411	1,220	1,200	2,220	800	2,200	450
31	172	-	223	122	-	220	-	2,450	-	220	-	450
Total	4,244	5,722	6,353	6,422	5,297	9,023	35,529	51,220	62,420	32,220	17,220	18,220
Mean	137	192	205	207	212	230	1,127	1,220	1,220	1,220	1,220	1,220
Ac-ft	8,420	11,350	12,600	12,740	11,290	18,000	70,210	102,300	122,300	72,220	34,420	30,720

Calendar year 1924 Max 1,210 Min 26 Mean 324 Ac-ft 270,200
 Water year 1924-25 Max 2,770 Min 26 Mean 711 Ac-ft 514,200

* No gage-height record.
 Note.--Stage-discharge relation affected by ice Nov. 18, 19, 22, Dec. 5, 6, 12-17, 22, Jan. 1-3, 7, 8, 22-26, Feb. 1-18, 22, 26, Mar. 1-20, 23-25.

BEAR RIVER BASIN

10-465. Bear River below Stewart Dam, near Montpelier, Idaho

Location.--Lat 42°16'30" Long 111°17'30", in NW 1/4 sec 34, T.13 S., R.44 E., on right bank 300 ft downstream from Stewart Dam and 4 1/2 miles south of Montpelier.

Drainage area.--2,820 sq mi, approximately.

Records available.--January 1922 to September 1928. Monthly discharge only January 1922 to September 1924, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 5,350 ft (from topographic map).

Average discharge.--43 years, 57.0 cfs (41,270 acre-ft per year).

Extremes.--Maximum daily discharge during year, 84 cfs Apr. 2 (gage height, 1.37 ft); minimum daily, 1.8 cfs Oct. 12, 13.
1922-24: Maximum daily discharge, 3,040 cfs June 2, 1923; no flow July 15, 1923.

Remarks.--Records good. Discharge measurements generally made once a week. Water diverted at Stewart Dam through Rainbow Inlet canal (see station 10-460) for storage and regulation in Bear Lake. Many diversions were made for irrigation.

Organization.--Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1924 to September 1933

Day	Discharge, in cubic feet per second, water year October 1924 to September 1933											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	2.8	3.6	6.5	4.8	5.3	18	5.8	2.4	5.2	4.2	5.8
2	2.4	2.8	4.0	5.8	4.8	4.8	22	5.8	5.2	5.2	4.2	5.8
3	2.5	3.0	4.0	4.6	4.6	4.8	13	6.2	4.2	5.2	4.2	5.8
4	4.2	3.0	3.0	4.8	5.3	4.8	8.0	5.8	4.4	5.8	4.2	5.8
5	4.2	2.6	3.9	4.4	5.8	4.4	5.5	5.4	2.4	5.8	5.3	5.8
6	4.2	2.9	2.6	4.6	5.8	4.2	5.5	5.2	4.6	5.6	4.5	5.8
7	3.3	2.6	2.5	4.4	5.6	4.2	4.4	4.6	4.6	4.6	4.5	5.8
8	3.2	3.2	2.4	4.4	5.3	4.4	4.4	5.0	5.6	4.6	4.5	5.8
9	2.9	2.8	2.5	4.4	5.0	4.2	4.4	7.7	5.6	5.6	4.5	5.8
10	2.8	3.3	2.8	4.4	5.0	4.6	4.2	7.1	5.8	5.8	4.4	5.8
11	2.5	3.4	2.0	4.2	5.0	4.4	4.2	6.8	5.2	3.6	4.5	5.8
12	2.1	3.6	2.4	4.2	5.3	4.4	4.8	6.2	5.0	3.6	4.0	5.8
13	1.7	3.3	2.3	4.2	5.0	4.4	4.2	5.9	5.6	3.6	3.5	5.8
14	1.7	3.3	2.2	4.2	4.8	4.2	4.2	5.3	5.3	3.6	3.3	5.8
15	1.6	3.6	2.2	4.4	4.4	5.0	5.5	5.3	5.6	3.6	3.4	5.8
16	1.5	3.4	2.3	4.8	4.0	5.3	3.4	5.0	5.2	2.8	4.0	5.8
17	1.5	3.6	2.2	4.9	4.0	5.3	3.2	5.2	5.2	2.8	4.0	5.8
18	2.2	3.0	2.0	4.4	4.2	5.3	3.0	5.6	5.2	2.8	4.5	5.8
19	2.3	2.9	1.8	4.2	4.2	5.3	3.0	6.2	6.2	2.5	4.0	5.8
20	2.3	3.2	1.9	4.4	3.8	5.3	2.9	7.1	5.2	3.2	3.8	5.8
21	2.2	3.0	2.0	4.2	4.8	5.5	3.0	6.0	6.2	3.6	3.8	5.8
22	2.1	3.0	2.3	4.0	5.0	5.5	3.0	6.0	6.2	3.6	3.8	5.8
23	2.4	3.0	3.6	4.0	5.0	6.2	3.3	6.0	6.0	3.6	3.8	5.8
24	2.5	3.2	6.5	4.0	4.8	6.2	4.2	6.6	6.6	4.0	3.8	5.8
25	2.5	4.8	7.4	4.2	4.8	7.1	4.8	7.4	7.4	5.6	3.8	5.8
26	3.0	4.2	10	3.0	4.2	5.9	5.0	21	7.7	4.0	3.8	5.8
27	3.3	3.4	10	4.0	4.6	7.7	5.2	21	7.4	3.8	3.8	5.8
28	3.3	3.0	8.4	4.0	5.3	6.8	5.9	16	7.4	3.0	3.8	5.8
29	3.3	3.6	5.0	4.2	5.3	9.8	5.8	16	7.4	3.4	3.8	5.8
30	2.8	4.0	7.1	5.4	5.6	6	5.9	14	7.4	3.4	3.8	5.8
31	2.8	3.2	8.2	4.8	5.6	5.6	5.6	14	7.1	3.8	3.8	5.8
Total	86.0	86.3	126.1	137.3	126.6	126.8	178.2	220.4	191.2	125.2	143.3	161.8
Mean	2.77	3.30	4.07	4.43	4.64	5.22	5.57	6.98	6.37	4.04	4.78	5.06
Ac-ft	171	196	250	272	255	304	343	356	379	248	294	321
Calendar year 1924:	Max	3.0	Min	0.8	Mean	3.26	Ac-ft	2,220				
Water year 1924-25:	Max	2.4	Min	1.0	Mean	3.12	Ac-ft	3,710				

BEAR RIVER BASIN

10-555. Bear Lake at Lifton, near St. Charles, Idaho

Location.--Lat 42°07'20", long 111°39'20", in NE1 sec.18, T.18 S., R.44 E., in Lifton pumping plant of Utah Power & Light Company, 2 1/2 miles east of St. Charles.

Drainage Area.--459 sq mi, approximately (does not include Mad Lake drainage).

Records available.--October 1903 to June 1906 (gage heights only), January 1921 to September 1955. Monthly contents only January 1921 to September 1945 published in WSP 1214. Published as Bear Lake at Fish Haven 1909-6.

Gage.--Water-stage recorder. Datum of gage is 2,500 ft above mean sea level, unadjusted (Levels by Utah Power & Light Company). October 1903 to June 1906, staff gage at different site and datum.

Extremes.--Maximum contents during year, 1,357,000 acre-ft July 25 to Aug. 1 (gage height, 22.74 ft); minimum, 228,000 acre-ft Oct. 23 to Nov. 2 (gage height, 15.63 ft).
1921-25: Maximum contents, 1,443,000 acre-ft June 10, 1923 (gage height, 22.68 ft); no usable contents Nov. 8-19, 1923 (gage height, 2.00 ft, lower limit of pumps).

Remarks.--Outflow regulated by gates and pumps at Bear Lake and by gates in dike at north end of Mad Lake. Inflow to lake augmented by water diverted from Bear River through Rainbow Inlet canal and Mingle Inlet canal, which empty into Mad Lake (see station 10-560). Water from Mad Lake reaches Bear Lake by a sluice or pumping plant of 47 gates in quantity at south end of Mad Lake. Capacity, 1,421,000 acre-ft between gage heights 2.00 (lower limit of pumps) and 23.65 ft (present feasible upper limit of storage with existing facilities). Storage water used for irrigation and power development. Figures given herein represent usable contents.

Cooperation.--Gage heights furnished by Utah Power & Light Company, under general supervision of Geological Survey, in connection with a Federal Power Commission project. Contents computed by Geological Survey from capacity table based on data furnished by Utah Power & Light Company.

Capacity table (gage height, in feet, and contents, in thousands of acre-feet)

12.0	621.8	16.0	858.6
13.0	687.5	17.0	928.9
14.0	753.0	18.0	1,028.8
15.0	821.0		

Contents, in thousands of acre-feet, at 6700, water year October 1904 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	822.4	822.0	821.0	820.4	820.7	820.8	820.0	820.8	1,255.2	1,327.1	1,327.0	1,327.0
2	822.7	822.0	821.4	821.2	821.4	821.6	821.2	1,020.0	1,255.5	1,327.0	1,327.3	1,327.0
3	823.1	822.7	822.1	822.2	822.4	822.2	821.8	1,020.8	1,263.8	1,336.9	1,335.8	1,336.2
4	823.4	822.7	822.4	822.4	822.7	822.8	822.2	1,021.2	1,267.7	1,321.5	1,324.2	1,327.8
5	823.7	822.7	822.7	822.8	822.8	822.8	822.9	1,021.8	1,272.9	1,328.1	1,322.8	1,328.2
6	823.1	822.7	822.4	822.6	822.1	821.0	821.8	1,022.1	1,278.4	1,320.3	1,320.7	1,327.8
7	823.4	822.7	822.1	821.9	821.5	821.0	820.8	1,022.0	1,284.1	1,324.8	1,324.8	1,328.2
8	823.7	822.7	822.8	822.8	822.8	822.3	822.7	1,022.3	1,282.1	1,322.0	1,324.8	1,321.3
9	821.7	822.7	822.4	822.3	821.2	820.0	821.0	1,022.8	1,287.3	1,321.8	1,322.9	1,322.7
10	821.0	822.7	822.1	822.0	821.5	820.7	821.0	1,023.4	1,291.5	1,324.4	1,324.8	1,322.7
11	821.0	822.4	822.8	822.8	822.4	821.4	821.0	1,022.9	1,297.7	1,324.8	1,328.7	1,322.7
12	821.0	822.0	822.4	821.3	821.8	822.0	821.0	1,023.8	1,301.3	1,323.8	1,327.3	1,322.0
13	820.4	822.0	821.1	822.0	821.6	821.7	821.0	1,024.1	1,307.8	1,326.5	1,328.2	1,321.3
14	820.4	822.0	821.1	822.7	821.3	820.4	821.7	1,024.0	1,312.2	1,326.5	1,328.1	1,321.6
15	820.7	822.7	821.8	822.4	821.9	821.1	821.1	1,024.2	1,318.2	1,326.8	1,328.1	1,320.9
16	820.7	822.7	821.8	824.0	821.6	821.5	821.2	1,024.0	1,322.4	1,325.5	1,328.2	1,320.2
17	820.0	822.7	822.4	824.7	821.3	821.4	821.7	1,023.8	1,323.4	1,324.8	1,328.1	1,320.2
18	820.4	822.7	822.4	825.4	820.7	820.8	821.0	1,023.6	1,327.0	1,324.3	1,324.0	1,320.8
19	820.4	822.7	823.1	826.1	821.3	820.9	821.0	1,023.0	1,327.0	1,328.1	1,327.8	1,320.8
20	822.7	822.7	823.1	826.8	822.7	822.8	822.7	1,023.8	1,328.8	1,324.4	1,323.8	1,327.1
21	827.7	827.7	823.9	828.2	822.4	820.8	820.3	1,112.6	1,280.0	1,254.2	1,220.4	1,268.4
22	827.0	827.7	824.1	827.8	821.1	820.5	820.7	1,115.4	1,283.8	1,254.8	1,221.1	1,268.6
23	827.0	827.7	827.8	826.2	820.8	821.2	821.2	1,119.6	1,281.8	1,254.8	1,219.7	1,261.4
24	826.4	827.7	824.8	825.9	820.8	821.2	820.8	1,125.2	1,287.1	1,254.2	1,219.0	1,262.8
25	826.4	827.7	822.7	822.8	820.5	821.2	821.2	1,127.9	1,275.4	1,254.2	1,222.0	1,227.9
26	825.7	827.7	822.8	820.2	820.2	821.8	821.8	1,122.1	1,279.7	1,254.4	1,218.3	1,227.2
27	825.7	822.4	822.8	820.8	822.2	822.8	1,002.2	1,126.3	1,226.0	1,255.6	1,217.6	1,228.6
28	825.6	822.0	822.8	821.8	822.2	822.2	1,002.8	1,140.8	1,221.0	1,256.3	1,218.9	1,228.1
29	825.0	822.0	822.3	823.0	822.2	824.4	1,003.8	1,144.0	1,227.2	1,227.0	1,218.2	1,224.4
30	822.0	822.0	825.0	823.7	822.8	824.3	1,012.4	1,147.8	1,222.1	1,227.0	1,214.9	1,222.0
31	822.0	822.0	825.4	823.0	822.6	824.6	1,012.3	1,150.3	1,222.0	1,227.0	1,214.9	1,222.0
(+)	15.08	18.13	15.85	16.24	16.85	18.85	17.82	19.72	21.96	22.74	22.12	21.53
(-)	-11.4	+4.7	+3.7	+2.8	+2.2	+20.4	+26.8	+33.8	+41.8	+46.8	-43.8	-20.3

Calendar year 1964 +175.4
Water year 1964-65 +456.8

+ Elevation, in feet, at end of month.
+ Change in contents, in thousands of acre-feet.

BEAR RIVER BASIN

10-595. Bear Lake outlet canal near Paris, Idaho

Location.--Lat 42°13'00", long 111°20'00", in SW 1/4 sec. 8, T.14 S., R.44 E., on right bank 2,000 ft downstream from headgates (at dike) and 3 miles southeast of Paris.

Records available.--January 1922 to September 1968. Monthly discharge only January 1922 to September 1945, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 5,530 ft (from topographic map).

Average discharge.--43 years, 326 cfs (257,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,400 cfs Aug. 12 (gage height, 18.84 ft); minimum daily, 3.0 cfs Nov. 23 to July 8, 1922-65; Maximum daily discharge, 1,370 cfs Aug. 2, 1924; minimum daily, 1 cfs for many days in 1937, 1954, 1959, 1961, 1964.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Discharge measurements generally made six times a week during periods of release from Bear Lake.

Organization.--Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	3.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,280	1,160
2	4.4	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,280	1,180
3	4.3	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,330	1,120
4	4.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,330	1,080
5	4.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,330	1,010
6	4.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,280	1,040
7	4.0	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,280	1,010
8	4.0	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1,240	882
9	3.9	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	264	1,280	868
10	3.8	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	700	1,280	821
11	3.8	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	522	1,520	818
12	3.7	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	482	1,370	810
13	3.6	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	482	1,370	800
14	3.6	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	482	1,330	877
15	3.5	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	482	1,320	1,000
16	3.4	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	482	1,280	1,080
17	3.4	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	504	1,270	821
18	3.3	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	522	1,280	777
19	3.3	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	580	1,240	782
20	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	552	1,220	758
21	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	588	1,220	753
22	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	580	1,220	717
23	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	588	1,180	822
24	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	584	1,010	868
25	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	588	984	868
26	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	568	990	880
27	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	577	1,010	802
28	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	558	964	878
29	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	613	934	868
30	3.2	4.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	1,230	1,030	874
31	3.2	-----	3.0	3.0	-----	3.0	-----	3.0	-----	1,230	1,130	-----
Total	112.3	82.1	82.0	83.0	84.0	83.0	80.0	83.0	80.0	14,084.0	37,388	28,237
Mean	3.63	3.07	3.00	3.00	3.00	3.00	3.00	3.00	3.00	454	1,208	898
Ac-ft	821	482	482	484	487	486	479	484	479	27,900	74,180	53,220
Calendar year 1964	Max 1,420	Min 1.0	Mean 178	Ac-ft 159,400								
Water year 1964-65	Max 1,370	Min 3.0	Mean 217	Ac-ft 157,600								

Note.--No gage-height record Jan. 1 to July 8, Sept. 6, 7.

BEAR RIVER BASIN

10-905. Bear River near Preston, Idaho

Location.--Lat 42°10', long 111°21', in NW 2 sec. 20, T14 S., R. 23 E., on left bank 600 ft downstream from head-
waters of West Snake Canal, 2 miles downstream from Mack Creek, 3 miles north of Preston, and 2 1/2 miles upstream
from Battle Creek.

Drainage area.--4,800 sq mi, approximately.

Records available.--October 1888 to December 1916, January to September 1917 (gauge heights only), January 1944
to September 1952. Prior to 1905, published as "at Battleground." Monthly discharge only for some periods,
published in WSP 1914.

Gage.--Water-stage recorder. Altitude of gage is 4,540 ft (from topographic map). Catcher 1888 to September
1917 staff or wire-weight gages at several sites within 5 miles downstream at different datums.

Average discharge.--82 cfs (1943-52), 780 cfs (664,700 acre-ft per year).

Exceedings.--Maximum discharge during year, 3,130 cfs Dec. 24 (gage height, 4.70 ft); minimum, 0.6 cfs July 14,
18 (gage height, 0.19 ft); minimum daily, 0.6 cfs Nov. 8,
1888-1917. Maximum discharge, about 5,800 cfs June 8, 10, 1907, estimated on basis of records for station
near Collinston, Utah; maximum gage height observed, 9.64 ft Jan. 17, 18, 1917 (backwater from ice), site and
stage then in use; minimum discharge not determined.
1943-52: Maximum discharge, 4,420 cfs Apr. 17, 1950 (gage height, 5.21 ft); minimum, 0.6 cfs June 14,
1949; minimum daily, 0.6 cfs July 8, 1952.

Remarks.--Records good. Station is below all irrigation diversions from Bear River in Idaho except Cuk River
pumps in SW 2 sec. 20, T16 S., R. 23 E. Natural flow of stream affected by storage reservoirs, power develop-
ment, diversions for irrigation, and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	285	322	755	850	792	873	1,080	1,730	572	733	1,010	1,050
2	308	459	820	732	740	870	1,280	1,230	908	808	822	1,020
3	317	374	584	808	812	819	1,400	1,340	772	588	822	1,250
4	324	708	754	802	832	828	1,480	2,020	854	420	1,020	1,080
5	323	395	884	782	852	800	1,410	1,770	848	702	1,020	1,210
6	380	572	229	912	1,090	322	1,460	1,320	582	432	356	1,200
7	375	385	822	822	852	831	1,270	1,210	530	420	1,240	1,220
8	278	32	822	784	1,080	822	1,240	1,300	822	412	1,130	1,220
9	320	402	624	772	822	811	1,230	842	842	381	1,020	1,230
10	322	822	800	436	812	842	1,410	1,170	812	712	812	1,220
11	272	422	512	782	522	827	1,430	1,320	801	427	1,020	1,220
12	342	871	824	722	871	866	865	1,220	742	847	1,140	1,270
13	314	332	121	712	821	872	1,320	1,220	1,020	341	1,020	1,220
14	342	520	427	822	842	822	1,210	1,220	810	322	1,020	1,270
15	284	272	572	792	722	727	1,220	1,070	712	372	1,220	1,220
16	354	222	822	312	872	730	1,170	772	722	612	1,040	1,200
17	362	477	822	342	842	621	1,120	841	742	221	1,110	1,270
18	342	410	412	812	327	702	864	1,020	822	812	1,100	1,220
19	312	412	272	822	722	621	1,000	1,070	727	221	1,100	1,210
20	322	821	300	822	622	702	1,220	1,020	812	342	1,220	1,220
21	302	522	522	822	422	822	1,400	1,220	822	472	1,220	1,270
22	222	122	1,120	842	810	803	1,270	1,300	722	321	1,220	1,220
23	302	401	2,220	721	811	702	1,270	1,220	372	321	1,140	1,200
24	324	522	2,220	322	847	772	1,220	1,270	522	322	1,110	1,200
25	220	522	1,220	712	422	522	1,240	1,220	842	420	1,220	1,270
26	322	434	1,200	822	427	470	1,220	1,100	802	522	1,400	1,220
27	172	822	1,220	722	822	822	1,710	1,020	1,220	507	1,020	1,220
28	222	822	1,220	722	821	320	1,720	270	1,220	422	1,220	1,220
29	222	372	1,040	1,000	-	322	1,720	322	1,220	572	1,120	1,210
30	222	802	1,110	1,220	-	702	1,240	822	1,240	1,020	1,220	1,240
31	322	-	822	1,220	-	240	-	422	-	1,040	1,270	-
Total	10,212	12,441	25,742	22,702	19,220	12,772	42,222	37,222	21,722	16,412	24,222	32,222
Mean	322	422	522	722	700	802	1,222	1,222	822	522	1,122	1,222
Ac-ft	21,220	22,220	21,020	12,040	22,220	37,220	22,220	22,220	22,220	22,220	22,220	22,220

Calendar year 1952: Max 2,320 Min 77 Mean 372 Ac-ft 42,000
 Water year 1951-52: Max 2,220 Min 22 Mean 242 Ac-ft 22,220

* Discharge measurement made on this day.

BEAR RIVER BASIN

10-930. Cub River near Preston, Idaho

Location.--lat 42°08', long 111°41', in SW¹/₄ sec.8, T.18 S., R.41 E., on right bank 0.2 mile upstream from head-gates of Cub River--Korn Creek Canal, 0.7 mile upstream from forest boundary, and 10 miles east of Preston.

Drainage area.--19.4 sq mi.

Records available.--March 1940 to September 1952, October 1955 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 5,320 ft (from topographic map).

Average discharge.--22 cfs, 63.3 cfs (60,310 acre-ft per year).

Hydrology.--Maximum discharge during year, 686 cfs June 13 (gage height, 2.97 ft); no flow for part of Jan. 28, result of snowslide.

1940-52, 1955-58: Maximum discharge, 715 cfs June 7, 1957 (gage height, 3.38 ft); maximum gage height, 3.83 ft June 2, 1943; no flow for part of Jan. 29, 1953, result of snowslide.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.4	14	2.0	328
.7	27	2.6	418
1.0	36	3.0	705
1.5	118		

Discharge, in cubic feet per second, water year October 1964 to September 1968

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	22	22	24	24	24	63	208	521	518	50	51
2	30	22	24	22	22	22	64	235	*534	310	55	51
3	31	22	24	22	22	22	51	215	534	255	55	50
4	31	22	22	22	22	22	48	213	540	230	55	45
5	31	22	22	22	22	22	48	222	602	270	52	49
6	31	22	22	22	22	22	48	205	627	256	72	52
7	30	22	22	22	22	22	51	172	525	244	76	52
8	22	22	22	22	22	24	51	153	627	232	77	48
9	22	22	*22	22	24	22	52	133	602	223	74	47
10	22	22	22	22	22	22	45	121	657	213	72	46
11	22	22	22	22	22	22	45	116	648	203	*72	48
12	22	22	22	22	22	22	40	118	631	*190	70	44
13	22	22	22	22	22	22	40	122	621	175	70	44
14	*22	24	22	22	22	22	33	137	390	168	62	43
15	22	24	22	22	22	22	38	136	577	159	55	44
16	22	24	22	22	22	27	40	218	521	151	65	44
17	22	20	20	22	22	22	38	44	*168	147	64	44
18	22	21	21	22	22	27	44	307	455	143	64	43
19	22	*20	20	22	22	26	51	322	450	139	62	43
20	22	22	22	22	22	24	54	342	435	135	62	*42
21	22	22	22	22	22	24	*52	330	445	129	63	42
22	22	22	22	22	22	22	104	322	455	123	62	42
23	22	22	*22	22	22	22	120	348	450	120	59	41
24	22	22	*22	22	22	22	110	338	440	118	56	40
25	22	22	42	22	*22	22	111	336	435	117	57	40
26	27	24	35	22	22	22	116	274	420	110	56	40
27	27	24	31	*22	24	22	118	256	421	103	54	40
28	22	22	22	22	24	22	125	270	392	104	54	40
29	22	22	22	22	22	22	*22	132	330	324	101	54
30	27	22	22	22	22	22	137	402	322	98	52	39
31	22	---	24	11	---	---	---	460	---	24	52	---
Total	330	732	558	713	664	745	2,133	7,659	15,355	5,455	2,100	1,333
Mean	22.7	24.4	27.7	23.0	23.7	24.0	71.1	246	513	176	57.7	47.2
Ac-ft	1,770	1,450	1,700	1,410	1,320	1,450	4,230	15,250	30,530	10,840	4,170	2,510
Calendar year 1964	Max 355	Min 17	Mean 30.3	Ac-ft 62,520								
Water year 1964-65	Max 348	Min 15	Mean 108	Ac-ft 75,650								

* Discharge measurement made on this day.
 a No gage-height record.

BEAR RIVER BASIN

10-1060. Little Bear River near Paradise, Utah

Location.--Lat 41°55'28", Long 111°51'10", in SE2 sec.20, T.10 N., R.1 E., on right bank 1 mile upstream from headwater of Hymus Reservoir, 2 miles northwest of Paradise, and 5 miles downstream from East Fork.

Drainage area.--803 sq mi.

Records available.--January 1927 to September 1962. Monthly discharge only for some periods, published in WSP 1934.

Gage.--Water-stage recorder. Altitude of gage is 4,350 ft (from topographic map). Prior to Nov. 28, 1948, at site 150 ft upstream at different datum. Nov. 28, 1948 to Mar 18, 1962 at present site at datum 1.20 ft higher.

Average discharge.--25 years, 63.3 cfs (60,310 acre-ft per year).

Remarks.--Maximum discharge during year, 868 cfs May 1 (gage height, 8.15 ft); minimum, 27 cfs June 22, 23, Aug. 18.

1947-58: Maximum discharge, 2,000 cfs Feb. 11, 1962 (gage height, 6.82 ft), from rating curve extended above 800 cfs by logarithmic plotting; minimum, 4 cfs Aug. 14, 1940.

Remarks.--Records good. Diversion shown section for irrigation of about 10,000 acres most of which is below section. Flow regulated slightly by Evout farm about 2 miles upstream and by Forepine Reservoir (capacity, 12,800 acre-ft) completed 1962. No diversion between station and Hymus Reservoir.

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	35	77	75	120	70	182	714	*202	*48	49	*42
2	36	39	77	77	85	82	184	822	178	42	*51	41
3	42	38	85	75	78	65	128	185	185	47	51	39
4	41	38	60	74	77	68	120	492	178	53	46	39
5	39	38	56	72	77	67	126	510	174	67	42	36
6	36	37	51	72	69	62	123	428	171	60	41	274
7	41	37	47	74	77	65	143	458	168	72	41	*17
8	39	37	75	70	70	65	120	310	156	62	42	86
9	39	36	62	72	74	67	123	230	123	59	37	52
10	38	31	53	68	72	65	103	282	126	51	32	74
11	37	46	58	65	67	67	100	253	117	46	42	66
12	37	37	53	65	65	53	67	259	114	55	42	60
13	37	39	47	60	65	51	52	332	150	44	44	56
14	36	47	83	60	70	61	67	227	133	*47	44	51
15	34	44	58	60	65	55	63	300	105	51	46	38
16	34	46	55	60	65	56	103	385	106	44	44	51
17	34	47	55	58	65	55	120	370	*82	49	41	36
18	33	47	55	56	60	47	79	330	79	60	44	38
19	34	51	55	58	60	44	171	310	67	35	55	62
20	36	58	56	56	62	44	192	328	58	53	53	60
21	36	53	58	58	65	48	196	320	38	58	58	58
22	34	55	56	55	72	49	*210	288	33	58	128	56
23	36	53	*225	56	65	49	244	283	32	53	135	53
24	37	53	320	60	62	48	227	287	67	56	100	51
25	37	58	178	56	62	42	272	259	117	55	74	49
26	37	52	120	56	*67	47	278	192	126	58	56	47
27	36	53	148	58	64	49	320	122	165	53	44	44
28	34	58	111	62	67	49	438	158	162	47	49	47
29	33	56	62	117	-	58	488	165	103	47	44	51
30	*39	*59	62	*202	-----	52	*534	171	26	49	44	47
31	39	-----	*62	253	-----	*137	-----	168	-----	55	42	-----
Total	1,138	1,428	2,722	2,344	2,027	1,648	5,752	9,960	3,638	1,705	1,717	1,802
Mean	36.6	47.5	87.8	75.6	73.4	53.5	192	321	121	55.0	55.4	56.1
Ac-ft	2,250	2,830	5,400	4,620	4,020	3,280	11,410	19,760	7,210	3,360	3,410	3,570

Calendar year 1964: Max 335 Min 28 Mean 60.9 Ac-ft 58,700
 Water year 1964-65: Max 714 Min 32 Mean 96.8 Ac-ft 71,550

* Discharge measurement made on this day.

BEAR RIVER BASIN

10-1090. Logan River above State dam, near Logan, Utah

Location.--Lat 41°44'40", long 111°47'00", in NE 1/4 sec. 36, T. 18 N., R. 1 W., on right bank at Logan plant of Utah Power & Light Co., 125 ft upstream from tailrace, half a mile upstream from State dam, and 2 1/2 miles east of Logan.

Drainage area.--216 sq mi.

Records available.--June 1933 to September 1935. Published as Logan River near Logan prior to 1933. Records since May 1933 equivalent to earlier records if records for Utah Power & Light Co.'s tailrace near Logan are added. Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,890 ft (from topographic map). Prior to May 7, 1913, staff gage at various sites within half a mile downstream, below confluence of tailrace, at different datums. May 7 to Sept. 30, 1913, water-stage recorder at present site at different datum and Oct. 1, 1913, to Sept. 3, 1935, at datum about 2.5 ft lower than present datum.

Average discharge.--82 years (1913-65), 103 cfs (74,570 acre-ft per year). Average combined discharge of Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal, 88 years (1896-1965), 274 cfs (199,400 acre-ft per year).

Extremes.--Maximum discharge during year, 960 cfs June 8, 13 (gage height, 4.28 ft); minimum daily, 15 cfs Dec. 27.

Maximum combined discharge during year (Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal) 1,863 cfs June 8; minimum daily, 100 cfs Dec. 18. 1913-65: Maximum discharge, 2,000 cfs May 21, 1913 (gage height, 8.6 ft, datum then in use), from rating curve extended above 1,000 cfs; minimum daily, 6 cfs Nov. 7, 1940.

1896-1935: Maximum combined observed discharge (Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal), 2,480 cfs May 21, 1907; minimum daily, 60 cfs Jan. 31, 1935.

Remarks.--Records excellent. Water diverted from river and springs above station for power, irrigation, and municipal supply. Flow regulated by powerplants above station. For records of combined flow of Logan River, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal, see following page. Combined flow record excludes that in Logan City culinary pipe lines and one small irrigation diversion from Power Plant that siphons canyon 400 ft upstream from station. During 1963 site of gaging station for Logan, Hyde Park & Smithfield Canal was changed; records of combined flow since that time are equivalent to previous records.

Cooperation.--Records collected in collaboration with Utah Power & Light Co. in connection with a Federal Power Commission project.

Discharge, in cubic feet per second, water year October 1960 to September 1965												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	89	20	26	71	27	31	461	454	502	77	21
2	37	50	22	26	49	31	36	470	660	480	73	21
3	37	78	15	25	32	32	32	436	360	477	72	21
4	56	23	15	30	42	31	57	420	371	461	34	21
5	56	23	15	27	35	35	109	174	568	544	80	21
6	36	22	15	24	43	32	126	352	377	420	57	42
7	46	26	13	23	41	27	126	227	345	400	34	47
8	36	22	14	21	33	28	120	252	439	336	50	27
9	54	22	17	15	36	30	102	217	339	363	50	28
10	34	24	15	20	27	27	87	182	344	343	43	28
11	34	24	15	19	22	31	77	182	349	324	48	28
12	33	17	14	20	25	28	71	152	322	313	46	21
13	33	17	14	17	20	28	69	189	301	287	44	21
14	32	16	14	16	19	27	65	203	292	282	44	21
15	32	14	14	17	21	28	77	305	371	234	45	21
16	32	14	14	16	24	29	84	400	472	228	43	21
17	32	14	14	16	23	27	81	303	772	215	34	21
18	32	14	14	16	21	27	71	320	728	214	31	21
19	30	15	16	16	20	27	123	234	735	300	31	20
20	26	15	21	16	20	25	220	547	735	196	30	19
21	31	14	20	16	21	23	275	328	750	175	30	15
22	33	14	27	16	22	22	243	325	750	165	44	15
23	60	14	128	17	37	26	272	335	730	343	33	18
24	30	14	158	18	21	26	276	520	720	143	40	19
25	27	17	23	18	26	23	308	439	728	191	36	19
26	26	22	57	16	24	23	315	516	720	114	34	18
27	22	16	50	15	28	27	280	512	720	120	31	18
28	27	13	40	15	30	26	256	516	636	94	25	18
29	27	15	36	30	-	72	290	392	531	27	25	18
30	27	15	30	44	-	-	309	344	512	27	25	17
31	23	-	28	37	-	120	-	730	-	25	23	-
Total	987	585	572	694	558	1,100	4,259	13,170	23,038	8,081	1,322	282
Mean	31.8	18.8	21.4	22.4	30.6	35.5	135	428	737	281	43.9	22.7
Ac-ft	1,960	1,120	1,330	1,260	1,700	2,160	8,840	26,120	46,320	16,080	2,700	1,350

Calendar year 1964: Max 327 Min 14 Mean 55.5 Ac-ft 84,560
 Water year 1964-65: Max 504 Min 13 Mean 136 Ac-ft 113,200

* Discharge measurement made on this day.

BEAR RIVER BASIN

10-1090. Logan River above State dam, near Logan, Utah — continued

Continued discharge, in cubic feet per second, of Logan River above State dam, Utah Power & Light Co.'s Lawrence, and Logan, Hyde Park & Smithfield Canal at head, near Logan, Utah, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	146	135	130	131	130	124	131	350	1,090	740	333	254
2	149	137	130	120	127	122	126	710	1,100	735	332	236
3	137	120	117	129	127	122	121	652	1,110	722	330	232
4	140	129	112	130	130	122	122	642	1,120	710	320	228
5	140	129	112	122	122	122	121	669	1,130	698	312	222
6	146	122	110	120	121	122	127	626	1,150	691	312	226
7	148	122	103	122	122	120	200	629	1,120	672	302	220
8	146	122	106	122	122	122	126	431	1,170	626	297	240
9	143	122	119	120	122	122	213	444	1,170	623	283	241
10	142	121	116	122	124	122	120	406	1,110	622	292	222
11	142	121	119	124	127	122	122	327	1,110	607	291	220
12	141	123	120	124	123	122	122	322	1,050	602	290	222
13	141	122	102	120	124	122	122	422	1,170	622	282	224
14	140	121	103	120	124	124	122	427	1,150	622	287	221
15	140	116	112	122	124	122	122	522	1,120	607	282	212
16	140	117	102	120	120	122	121	622	1,100	422	280	222
17	122	122	102	120	120	124	222	742	1,020	424	272	224
18	122	122	100	112	122	121	212	772	622	424	272	220
19	127	121	102	122	124	120	271	600	671	422	240	222
20	122	122	102	112	122	121	272	602	671	422	272	222
21	122	122	117	112	122	120	427	724	622	441	277	222
22	127	121	124	117	120	122	602	722	320	422	222	220
23	127	121	227	120	122	122	512	720	322	402	272	212
24	127	121	222	122	122	122	424	724	322	322	270	212
25	124	122	222	120	122	112	472	724	322	322	224	214
26	122	121	122	114	122	122	422	722	371	322	222	212
27	122	122	122	122	122	122	422	722	322	372	222	202
28	124	122	122	122	122	124	221	424	722	322	242	202
29	124	122	122	122	122	122	422	622	722	322	244	272
30	124	122	122	122	122	122	510	621	722	322	242	202
31	122	122	122	122	122	122	627	622	722	322	222	202
Total	4,327	2,722	2,022	2,200	2,200	2,722	2,272	20,422	21,220	12,222	2,222	2,222
Mean	140	122	122	122	122	122	222	322	1,022	322	222	222
Ac-ft	2,200	7,220	2,220	7,220	7,220	7,220	7,220	20,220	21,220	22,220	17,220	12,220
Calendar year 1964:	Max 1,020	Min 72	Mean 222	Ac-ft 122,100								
Water year 1964-65:	Max 1,170	Min 100	Mean 212	Ac-ft 222,200								

BEAR RIVER BASIN

10-1135. Blacksmith Fork above Utah Power & Light Co.'s dam near Hyrum, Utah

Location.--Lat 41°37'20", long 111°44'00", in NE1/4 sec. 6, T.10 N., R.2 E., on right bank three-quarters of a mile upstream from diversion dam, 31 miles upstream from powerplant of Utah Power & Light Co., and 3 miles east of Hyrum.

Drainage area.--260 sq. mi.

Records available.--October 1913 to September 1933. Monthly discharge only for October 1913, published in XSF 1314.

Gage.--Water-stage recorder. Altitude of gage is 5,000 ft. (from topographic map). Prior to Oct. 2, 1933, at site 1,600 ft. upstream at different datum.

Average discharge.--83 cfs (89,680 acre-ft per year).

Extremes.--Maximum discharge during year, 717 cfs Apr. 23 (gage height, 4.94 ft); minimum daily, 60 cfs Nov. 16. 1913-33: Maximum discharge, 1,220 cfs May 18, 1917 (gage height, 6.8 ft, from floodmarks, site and datum than in use), from rating curve extended above 800 cfs; minimum daily, 28 cfs Jan. 2, 1933.

Remarks.--Records good except those for periods of no gage-height record, which are fair. A few small diversions for irrigation of about 200 acres above station. Low flow may be slightly regulated by powerplant above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifflin-control method used Oct. 1 to Nov. 2, Apr. 22-24)

2.1	55	3.0	271
2.2	72	4.0	525
2.5	125	4.2	632

Discharge, in cubic feet per second, water year October 1933 to September 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	52	51	52	121	90	122	315	324	182	143	124
2	52	52	52	72	122	90	212	322	322	182	142	122
3	52	52	72	72	122	92	122	322	322	182	142	122
4	52	52	72	72	122	92	122	322	322	182	142	122
5	52	52	72	72	122	92	122	322	322	182	142	122
6	72	52	72	72	122	92	212	322	272	182	142	122
7	72	52	52	72	111	92	222	322	372	182	142	122
8	72	52	52	72	100	92	212	322	272	182	134	121
9	72	52	52	72	101	92	221	322	282	182	131	122
10	72	72	72	72	100	92	221	312	282	182	132	122
11	72	72	72	72	92	90	202	282	282	182	131	122
12	72	72	72	72	92	90	182	222	282	182	122	122
13	72	72	62	62	92	90	182	202	242	162	121	122
14	72	72	62	62	92	90	162	212	242	162	121	122
15	72	62	72	62	67	90	172	222	222	162	121	122
16	72	50	62	62	60	92	200	222	210	152	121	122
17	72	72	70	62	62	92	222	222	200	152	122	122
18	72	72	70	62	62	92	222	222	182	142	122	122
19	62	62	70	62	67	92	221	222	182	142	122	122
20	62	62	70	62	67	92	212	222	182	142	122	122
21	62	62	72	62	60	92	222	222	182	142	122	122
22	62	62	51	62	62	92	222	212	182	142	122	122
23	62	62	62	62	62	92	207	207	182	142	122	122
24	62	62	62	62	62	92	222	222	182	142	122	122
25	62	72	62	62	62	92	222	222	182	142	122	122
26	62	72	120	62	62	92	222	222	162	142	121	122
27	62	72	112	62	62	92	201	222	172	142	122	122
28	62	72	102	62	67	92	222	212	172	142	122	122
29	62	72	92	62	-	92	221	222	172	142	122	122
30	62	72	92	120	-	92	222	222	162	142	122	122
31	62	-	67	62	-	92	222	222	142	142	122	122
Total	2,224	2,022	2,722	2,120	2,222	2,222	10,022	12,302	6,222	4,222	4,112	3,772
Mean	72.1	69.2	89.2	72.2	72.2	72.2	322	322	222	142	134	122
Ac-ft	4,220	4,180	5,220	4,620	5,220	5,220	12,220	24,220	12,220	6,220	6,220	7,220

Calendar year 1933: Max 120 Min 44 Mean 102 Ac-ft 72,220
 Water year 1933-34: Max 212 Min 20 Mean 127 Ac-ft 112,620

Peak discharge (base, 120 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-21	1230	3.50	352	4-23	0130	4.94	717
1-31	1430	3.03	222	2-8	1230	2.22	122

* Discharge measurement made on this day.
 Note.--No gage-height record Oct. 22-30, Nov. 2-30, June 12-30.

BEAR RIVER BASIN

10-1170. Hammond (East Side) Canal near Collinston, Utah

Location.--Lat 41°0', long 112°0', in SW sec.27, T.13 N., R.2 E., on right bank 3,000 ft downstream from Taylor Dam and 1 mile north of Collinston.

Records available.--June 1912 to September 1965. Prior to 1912, published as Hammond ditch near Collinston. Minimum discharge only for some periods, published in WSP 1314.

Gage.--River-gage recorder. Prior to May 22, 1914, staff gage at same site and datum.

Average discharge.--52 cfs, 50.8 cfs (34,250 acre-ft per year).

Discharge.--1914-65: Maximum daily discharge, 180 cfs June 29, 1963; no flow at times in each year.

Remarks.--Records good. Canal diverts from east side of Bear River in NW/4 sec.23, T.13 N., R.2 E., at dam at which West Side Canal and Intake of Collier generator also divert. Water from this canal and West Side Canal used for irrigation of about 35,000 acres later station in eastern Box Elder County.

Organization.--Gage-height record and flow discharge measurements furnished by Utah Power & Light Co.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Sluicing-control method used May 2-16)

0.8	0	2.0	33
1.0	1.2	2.5	44
1.1	2.3	3.0	70
1.2	3.1	4.0	132
1.3	31	4.5	175

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	75						0	123	88	149	112
2	75	75						0	162	119	180	119
3	75	75						0	166	131	148	112
4	75	75						72	165	140	148	113
5	75	75						65	157	141	149	114
6		77	10					63	153	133	180	81
7		75	10					60	153	133	180	79
8		71	10					61	153	133	148	77
9		64	10					72	152	120	148	72
10		60	10					77	151	120	153	72
11		55	10					87	152	120	159	72
12		55	0					105	157	120	151	72
13		48	0					110	147	122	130	72
14		48	0					115	130	121	130	70
15		48	0					122	151	121	130	72
16		48	0					150	148	121	138	62
17		48	0					152	131	122	137	60
18		48	0					150	140	122	138	57
19		42	0					152	142	122	148	58
20		42	0					151	140	120	148	62
21		44	0					161	140	122	153	64
22		41	0					161	133	121	138	62
23		38	0					161	134	122	138	62
24		28	0					151	134	122	138	61
25		23	0					161	130	124	138	61
26		22	0					161	82	148	124	61
27		22	0					161	46	150	122	61
28		22	0					161	42	150	122	60
29		22	0					161	48	150	122	62
30		24	0					162	52	150	113	62
31		18	0					162		150	112	
Total	1,355	1,000	0	0	0	0	0	3,612	4,069	4,025	4,231	2,205
Mean	50.8	6.97	0	0	0	0	0	117	132	132	133	72.8
Ac-ft	3,130	337	0	0	0	0	0	7,160	8,270	8,270	8,290	4,350
Calendar year 1964: Max	171	Min	0	Mean	50.8	Ac-ft	22,540					
Water year 1964-65: Max	172	Min	0	Mean	50.8	Ac-ft	23,200					

* Discharge measurement or observation of no flow made on this day.

BEAR RIVER BASIN

10-1175. West Side Canal near Collinston, Utah

Location.--Lat 41°04', long 112°04', in SW¹/₄ sec.27, T.18 N., R.2 W., on left bank 4,200 ft downstream from Cutler Dam and 4 miles north of Collinston.

Records available.--June 1924 to September 1964. Monthly discharge only for some periods, published in RFP 1214.

Gage.--Water-stage recorder. Prior to May 26, 1934 staff gage at same site and datum.

Average discharge.--23 years, 233 cfs (170,900 acre-ft per year).

Extremes.--1924-25: Maximum daily discharge, 756 cfs July 7, 1924; no flow for periods in every year except 1924.

Remarks.--Records good except those for periods of ice effect, which are fair. Canal diverts from west side of Bear River in NW¹/₄ sec.26, T.18 N., R.2 W., at dam at which Hammond (East Side) Canal and intake of Outlier powerplant also divert. Water from this canal and Hammond (East Side) Canal used for irrigation of about 55,000 acres below station in eastern Box Elder County.

Organization.--Gage-height record and 3 discharge measurements furnished by Utah Power & Light Co.

Rating table, except periods of ice effect (gage height,
in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 3 to Sept. 6)

0.2	0	2.0	82
.4	3.0	3.0	130
.6	5.5	4.0	153
.8	14	5.0	188
1.2	35	6.4	265

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	462	34	22	123	22			0	827	222	213	637
2	398	27	22	123	22			0	877	722	216	647
3	350	24	20	123	14			5.1	623	522	203	621
4	322	21	18	123	14			273	622	522	204	623
5	287	18	16	123	14			271	622	522	213	623
6	270	16	15	26	13			222	622	722	226	627
7	373	22	22	22	13			222	622	722	222	622
8	374	22	20	22	13			273	627	722	242	627
9	452	27	27	22	13			222	673	727	252	646
10	324	17	17	27	13			242	622	727	271	646
11	214	14	14	27	113			222	621	722	221	642
12	222	14	14	27	113			222	672	727	221	642
13	274	14	14	27	113			402	622	722	227	642
14	272	13	13	27	113			422	621	722	227	622
15	222	12	12	27	113			421	621	722	222	622
16	242	11	11	22	12			422	627	717	222	611
17	222	10	10	22	12			602	602	622	222	641
18	222	10	10	127	12			621	621	627	221	621
19	222	10	10	122	7.7			621	627	642	227	622
20	222	10	10	122	4.4			622	627	642	222	622
21	221	10	10	22	4.4			701	627	627	222	621
22	222	10	10	22	4.4			712	621	622	217	620
23	120	62	24	22	3.2			722	727	621	221	620
24	177	62	22	22	1.8			722	621	621	221	620
25	177	62	22	27	0			722	421	621	273	620
26	177	64	22	26	0			717	322	622	273	623
27	122	64	22	26	0			722	222	622	270	623
28	122	64	22	27	0			721	222	627	272	623
29	122	64	22	22	0			722	274	622	222	622
30	112	64	22	22	0			722	212	622	222	620
31	22	22	22	22	0			711	212	612	222	620
Total	2,221	2,221	1,222	211	270.7	0	0	14,224.1	17,222	20,222	12,727	12,222
Mean	222	72.7	32.0	27.1	2.27	0	0	522	522	622	222	222
Ac-ft	12,272	2,222	2,100	1,222	227	0	0	22,222	22,222	20,172	37,100	22,722
Calendar year 1924	Max	722	Min	0	Mean	224	Ac-ft	122,200				
Water year 1924-25	Max	722	Min	0	Mean	227	Ac-ft	122,000				

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

BEAR RIVER BASIN

10-1180. Bear River near Collinston, Utah

Location.--lat 41°00', long 112°05', in NW1/4 sec. 27, T.13 N., R.2 W., on right bank 800 ft downstream from earlier plant of Utah Power & Light Co., 2,000 ft downstream from Gutter Dam, and 8 1/2 miles north of Collinston.

Drainage area.--6,000 sq mi. approximately.

Records available.--July 1898 to September 1961. Published as "at Collinston" prior to 1900. Monthly discharge only for some periods, published in GSP 1314.

Gage.--Water-stage recorder. Datum of gage is 4,378.13 ft above mean sea level (levels by Bureau of Reclamation). Prior to Nov. 9, 1913, staff gage, and Nov. 9, 1913 to Sept. 10, 1938, water-stage recorder, at site three-quarters of a mile downstream at different datum.

Extremes.--Maximum discharge during year, 3,600 cfs May 13 (gage height, 1.83 ft); minimum daily, 22 cfs Oct. 8, 1959-1961. Maximum discharge observed, 11,600 cfs June 7-10, 1908 (gage height, 7.70 ft, site and datum when in use); minimum daily, 10 cfs Aug. 3-12, 18-23, 1908; practically no flow on 12 p.m. Aug. 8, 1920.

Remarks.--Records excellent. Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation, and return flow from irrigated areas.

Computation.--Ten discharge measurements furnished by Utah Power & Light Co.

Discharge, in cubic feet per second, water year October 1961 to September 1965

Mo.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	424	1,450	2,080	2,200	1,800	1,400	2,500	1,750	2,300	834	1,000
2	581	824	1,230	2,040	2,020	1,820	1,470	2,800	1,900	2,700	808	1,010
3	478	966	1,250	2,100	2,220	1,840	1,540	2,750	1,970	1,800	822	988
4	468	642	1,310	1,280	2,220	1,480	2,220	2,220	1,220	1,530	702	1,020
5	23	304	1,120	1,220	2,710	1,340	2,040	2,220	2,040	1,330	815	888
6	522	827	822	2,320	2,270	1,420	2,220	2,220	1,220	822	802	1,420
7	522	822	821	2,270	2,220	1,210	2,200	2,220	1,200	*22	752	2,020
8	22	321	1,020	1,270	2,020	1,320	2,270	2,270	1,270	27	322	2,020
9	322	827	1,020	1,220	2,220	1,020	2,120	2,220	1,220	222	802	2,020
10	322	824	1,020	822	1,220	1,220	2,220	2,220	1,220	222	*22	2,020
11	422	1,020	1,020	1,700	2,120	1,220	2,770	2,020	1,420	22	822	2,020
12	672	1,020	1,020	1,220	1,220	1,220	2,770	2,170	1,220	22	822	2,020
13	227	1,020	1,020	1,220	1,710	1,020	2,020	2,220	2,020	22	822	2,020
14	822	1,020	1,220	1,220	1,100	822	*2,110	2,020	1,220	122	772	1,720
15	222	722	1,120	1,220	1,220	1,220	2,220	2,020	1,220	22	222	1,220
16	321	801	1,220	1,220	1,220	1,220	2,120	1,220	2,270	22	824	1,700
17	722	822	1,220	1,220	1,220	1,220	2,220	1,710	2,220	22	*720	1,720
18	322	812	720	1,220	1,220	1,020	2,720	1,220	2,220	22	222	1,700
19	712	904	712	1,220	1,720	1,120	2,220	1,220	2,020	204	722	1,700
20	804	804	810	1,270	1,220	1,220	1,220	2,020	1,220	220	822	1,220
21	822	221	1,200	1,200	1,220	1,120	2,220	2,200	1,700	422	1,220	1,700
22	822	222	1,220	1,220	1,220	1,220	2,220	2,220	1,220	222	1,220	1,220
23	822	222	2,220	822	1,220	1,270	2,120	1,210	1,220	222	1,220	1,270
24	210	1,020	2,010	822	1,220	2,110	2,220	1,220	1,220	22	1,220	1,220
25	670	1,020	2,120	1,220	1,720	1,120	2,220	2,170	2,020	327	2,020	1,020
26	770	222	2,270	1,210	1,220	222	2,210	*2,120	2,220	221	1,220	1,120
27	802	1,220	2,220	1,120	1,220	1,120	2,220	2,220	1,220	277	1,710	227
28	620	722	2,220	1,220	1,100	1,220	2,220	1,220	2,020	222	1,270	1,220
29	422	822	2,220	1,220	1,220	1,220	2,220	1,710	2,120	22	1,220	1,220
30	770	1,120	2,220	2,220	1,220	1,220	2,220	1,220	2,220	222	1,120	1,220
31	721	-----	1,220	2,220	-----	2,220	-----	1,220	-----	422	804	-----
Total	18,712	27,222	21,070	42,222	22,020	20,204	77,720	77,220	27,270	12,220	22,220	22,220
Mean	599	862	677	1,220	1,220	1,220	2,220	2,220	1,220	222	222	1,220
Ac-ft	22,120	22,020	10,220	22,220	102,200	21,120	122,200	122,200	12,200	20,120	22,270	22,220
Calendar year 1964	Max 2,220	Min 20	Mean 1,220	Ac-ft 22,200	Calendar year 1965	Max 2,220	Min 20	Mean 1,220	Ac-ft 22,200			

* Discharge measurement made on this day.