

FIFTH ANNUAL REPORT

BEAR RIVER
COMMISSION

1962



For the Report-Year October 1, 1961 to
September 30, 1962

LOGAN, UTAH

April 1, 1963

BEAR RIVER COMMISSION

P. O. BOX 413
LOGAN, UTAH

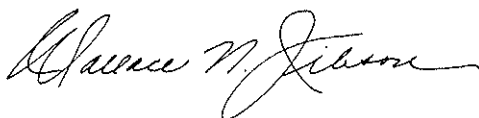
April 1, 1963

Mr. President:

Submitted herewith is the Fifth 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, appearing to read "Wallace N. Jibson".

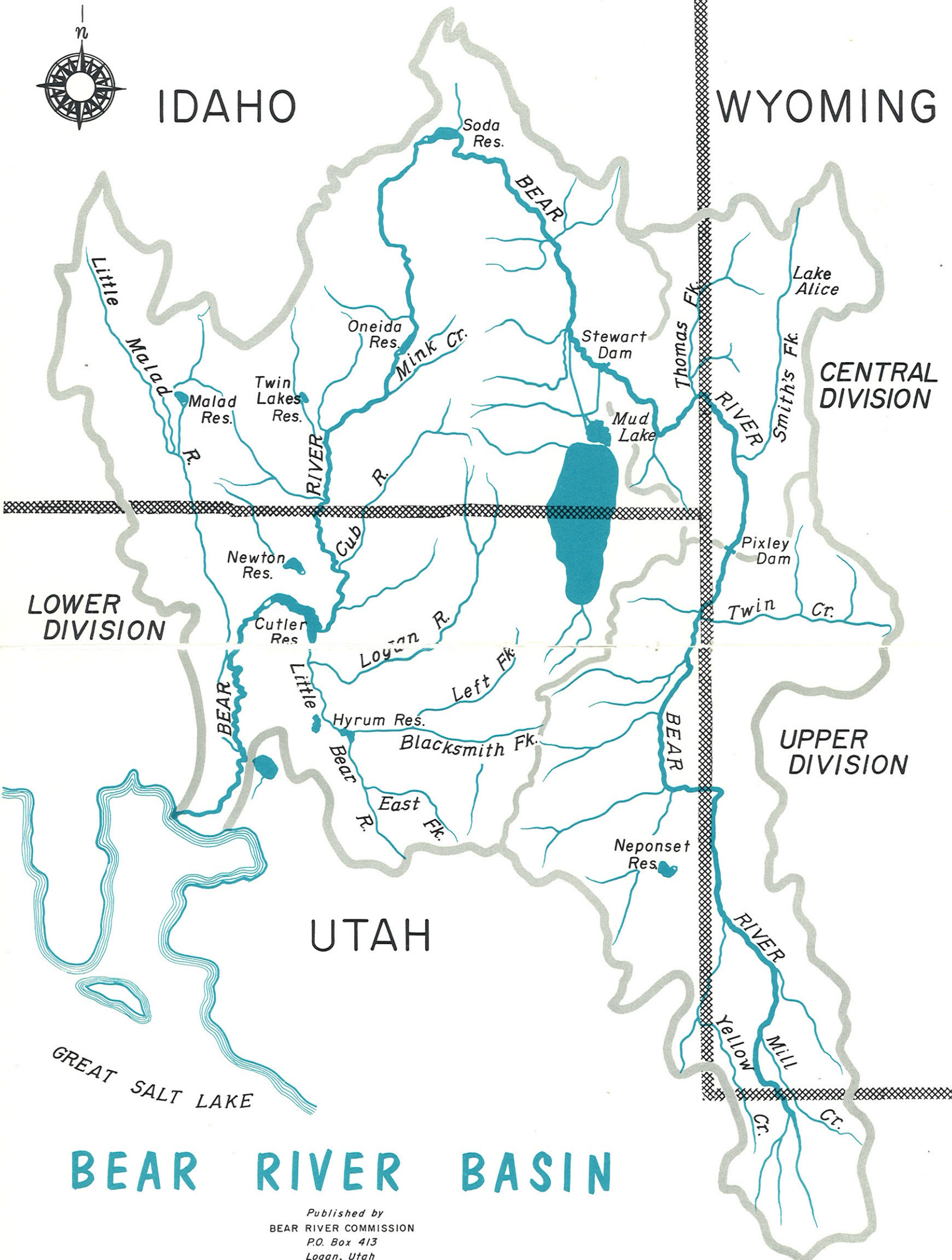
Wallace N. Jibson
Assistant Secretary

THE PRESIDENT
The White House
Washington, D. C.



IDAHO

WYOMING



LOWER DIVISION

CENTRAL DIVISION

UPPER DIVISION

UTAH

GREAT SALT LAKE

BEAR RIVER BASIN

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

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FIFTH ANNUAL REPORT OF THE BEAR RIVER COMMISSION

April 1, 1963

I. Introduction

The Bear River Compact is an interstate pact which determines the rights and obligations of the signatory States of Wyoming, Idaho, and Utah with respect to the waters of Bear River. Federal consent was given by the Congress, and legislation was approved March 17, 1958 by the President. The Bear River Commission was established as the interstate administrative agency to carry out provisions of 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, 1962 are summarized in this report. Financial report of the auditors and daily stream-gaging records are included in the appendixes.

II. 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.

Cleo L. Swenson was appointed to the Commission in December 1961 to fill a vacancy in the Idaho representation caused by the death of Fred M. Cooper.

OFFICERS

ChairmanE. O. Larson, Salt Lake City, Utah
Vice-ChairmanJ. W. Myers, Evanston, Wyoming
Secretary-TreasurerJay R. Bingham, Bountiful, Utah
Assistant SecretaryWallace N. Jibson, Logan, Utah

MEMBERS

Idaho

Cleo L. SwensonPreston, Idaho
Melvin LauridsenMontpelier, Idaho
George N. CarterBoise, Idaho

Utah

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

Wyoming

Earl LloydCheyenne, Wyoming
S. Reed DaytonCokeville, Wyoming
J. W. MyersEvanston, Wyoming

United States

E. O. LarsonSalt Lake City, Utah

COMMITTEES

Budget

A. V. SmootCorinne, Utah
J. W. MyersEvanston, Wyoming
Melvin LauridsenMontpelier, Idaho

Operations

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

III. Meetings

Meetings of the Commission were held in accordance with the bylaws as follows:

Annual Meeting — April 30, 1962 — Salt Lake City, Utah

Regular Meeting — November 2, 1962 — Salt Lake City, Utah

IV. Budget and Fiscal Disbursements

ADOPTED BUDGET (As Revised)

	<i>Fiscal Year Ending 6-30-1962</i>	<i>Fiscal Year Ending 6-30-1963</i>	<i>Total Biennium Ending 6-30-1963</i>
Compact Administration			
Personal Services	\$ 7,300	\$ 7,000	\$14,300
Travel and Subsistence	1,000	1,100	2,100
General Office Expense	370	220	590
Fiscal & Administrative	340	416	756
Washington Office Tech. Charge	740	864	1,604
Printing and Reproduction	700	700	1,400
Treasurer (Bond and Audit)	400	400	800
Transcribing Minutes	150	150	300
Legal Retainer Fee	300	300	600
Miscellaneous	100	100	200
Sub-Total	\$11,400	\$11,250	\$22,650
Stream-Gaging Program			
Geological Survey	\$30,600	\$31,500	\$62,100
Total	\$42,000	\$42,750	\$84,750

ALLOCATION OF PROPOSED BUDGET

U. S. Geological Survey	\$15,300	\$15,750	\$31,050
State of Idaho	8,900	9,000	17,900
State of Utah	8,900	9,000	17,900
State of Wyoming	8,900	9,000	17,900
Total	\$42,000	\$42,750	\$84,750

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, 1962, statement of budget revenue and appropriation accounts for the fiscal year ended June 30, 1962, are included in this report as appendix A.

V. 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 this program of water measurement which in 1962 included daily records of streamflow at 48 gaging stations. An additional 11 gaging stations in the basin are operated by Utah Power & Light Company under FPC license.

Nine gaging stations, financed by the Public Health Service, were installed during the summer on Cub River, Worm Creek, and Cub River Canal to determine streamflow for use in pollution analysis near the Idaho-Utah State line. Three gaging stations with adequate periods of record were discontinued September 30, 1962: Mill Creek at Utah-Wyoming State line, Twin Creek at Sage, Wyoming, and Mink Creek below Dry Fork near Mink Creek, Idaho.

Water commissioners, employed by irrigation district or State, collected seasonal daily or partial records on about 130 irrigation canals above Bear Lake. These records were made available once or twice each week to the Commission office and were used to determine section allocations as required by the Compact. Geological Survey personnel spot checked discharge measurements and gaging procedures for adherence to standards of the Commission. Daily discharge records for canals in the Central Division are shown in tables 1-5; those in the Upper Division are maintained in the Commission file but are not published herein.

VI. Hydrology

A. Water Supply

Water supply in 1962 from the headwater basins of Bear River and Smiths Fork exceeded longtime averages for the first time since the Bear River Compact has been in operation. Annual supply from these basins was 118 percent of the 20-year average, but runoff from most tributary basins below Bear Lake was slightly below this average.

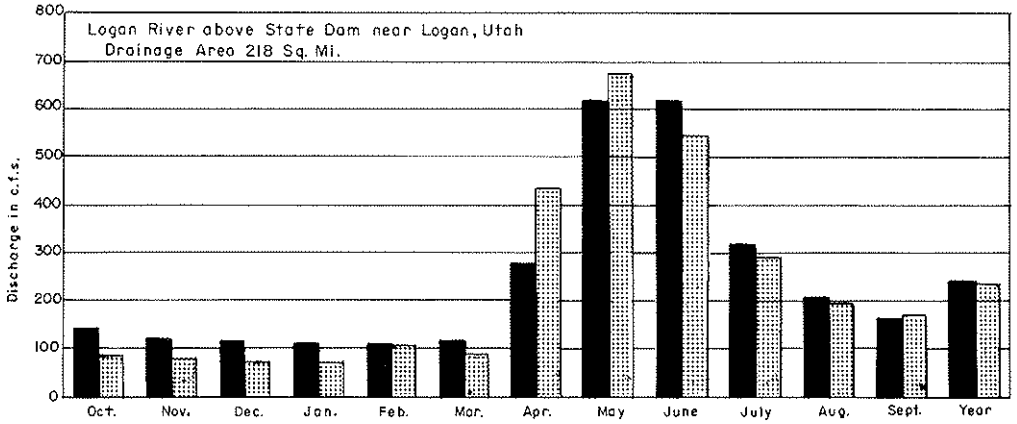
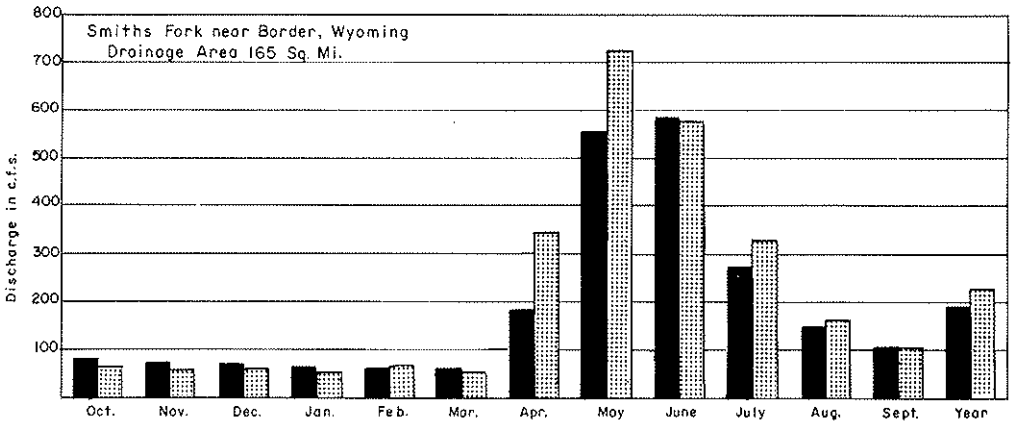
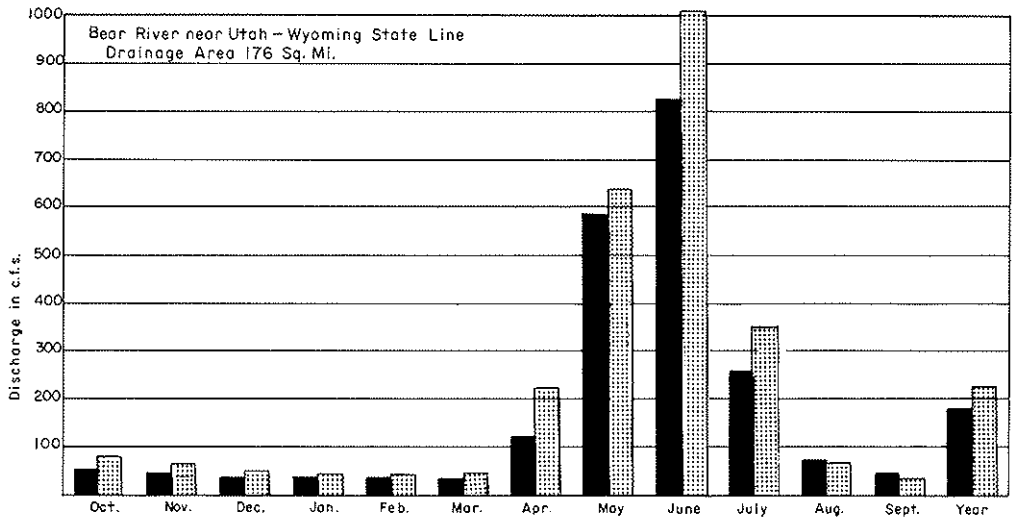
Monthly and annual discharge at three representative gaging stations in the basin compared with longtime averages is shown in figure 1. Hydrographs of Bear River and Smiths Fork runoff are shown in figures 3 and 4 and the data are summarized in the following tables:

Runoff in Acre-feet May-September

	<i>Average 1943-62</i>	<i>1961</i>	<i>1962</i>
Upper Bear River	113,700	66,300	131,800
Smiths Fork	101,600	43,400	121,200
Total	215,300	109,700	253,000

Runoff in Acre-feet Water Year

	<i>Average 1943-62</i>	<i>1961</i>	<i>1962</i>
Upper Bear River	136,200	82,500	166,700
Smiths Fork	138,000	73,100	164,200
Total	274,200	155,600	330,900



Monthly and Yearly mean discharge for period 1943 - 1962.
 Monthly and Yearly mean discharge for 1962 Water Year.

Fig. 1 Comparison of discharge at three representative gaging stations during 1962 with average discharge for period 1943-1962.

Bear Lake gained 392,000 acre-feet during the storage period and lost only 152,000 acre-feet during the irrigation season which resulted in a net gain of 240,000 acre-feet. This annual gain which has been exceeded in only a few years in the period of operation is shown with other lake data in the bar graph in figure 2. Bear Lake hydrographs are shown in figure 6, daily contents are tabulated in appendix B, and comparative elevations are shown in the following table:

*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>
1960	5,916.27	5,918.51	5,914.30
1961	5,914.25	5,914.90	5,909.75
1962	5,909.75	5,915.70	5,913.44

B. Weather Modification Program

A cloud-seeding program sponsored by Utah Power & Light Company has been in operation for the past several years and was continued during 1962. Silver iodide is released from smoke generators situated at strategic points over the upper basin.

VII. Administration of Bear River Compact

A. General

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 with the project office serving also as principal office for the Commission.

The project engineer serves as Assistant Secretary to the Commission with responsibility to provide technical assistance and current streamflow data as required to operate under terms of the Compact. He establishes operational procedures, prepares hydrologic studies, and maintains the files and records of the Commission. Annual reports are compiled by the Assistant Secretary and Secretary-Treasurer.

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.

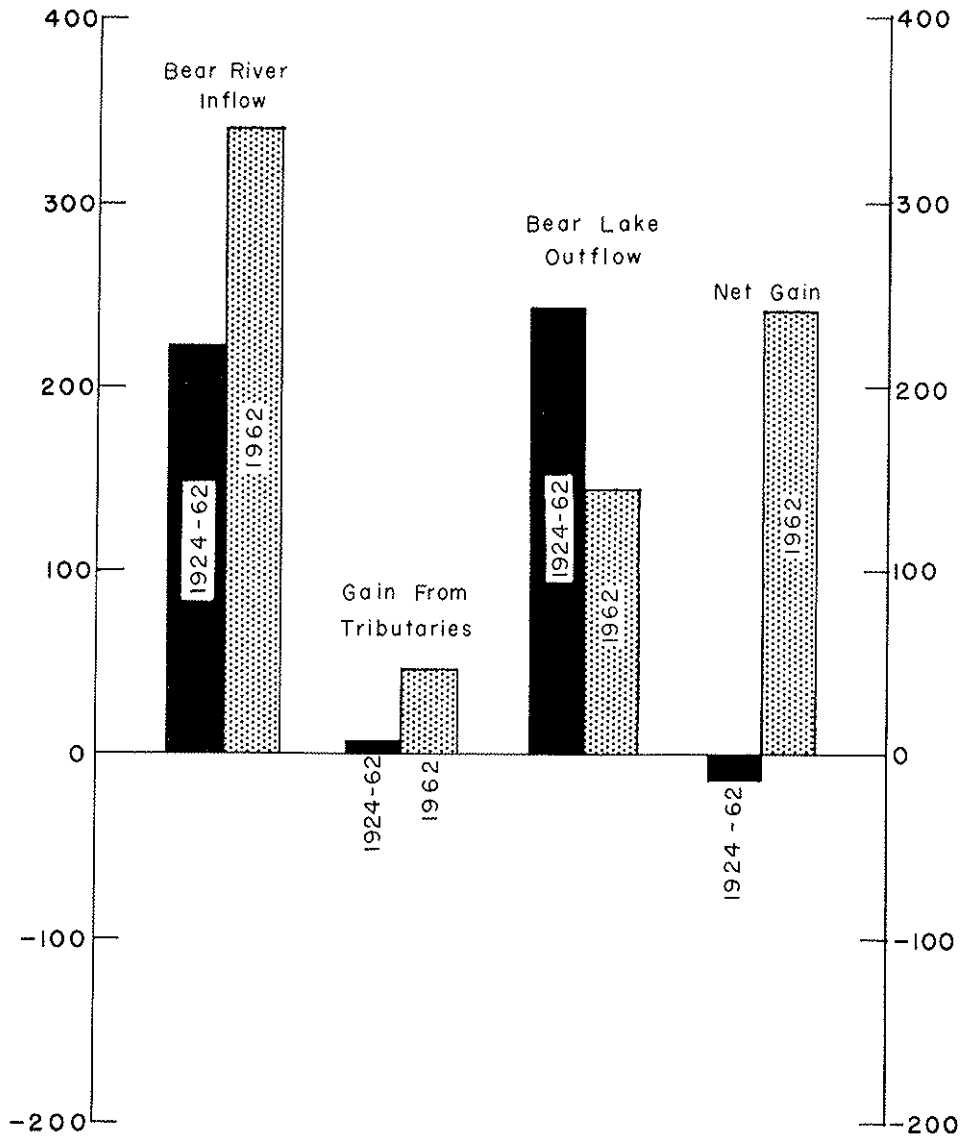


Fig 2. BEAR LAKE
Annual Quantities in Thousands of Acre-Feet

B. Distribution of Streamflow

Streamflow records of individual diversions and of the river flow at designated points were collected by the Geological Survey, local water commissioners, and Utah Power and Light Company. Records were submitted currently to the Assistant Secretary for computation of diversion and allocation data which were then reported to the Commission and local water commissioners for such regulatory action as required for compliance with the Compact.

1. Upper Division

The Upper Division comprises that portion 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

A water emergency requiring allocations to State sections existed after July 10 when the divertible flow became less than 1,250 cfs. Lower Wyoming Section had ceased diverting a few days earlier, and by July 10 relatively high flows were passing Pixley Dam. The unused Wyoming allocation, in accordance with article IV 1 e, thereby became available to the Upper Wyoming Section which for the balance of the season diverted within practical limits of allocation. (See figure 7.) Lower Utah and Lower Wyoming diversions are shown in figure 8 in which is segregated the diversion of storage water released from Woodruff Narrows Reservoir.

2. 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 periods of such emergency.

A water emergency as defined above began July 23, 1962 when the divertible flow became less than 870 cfs, and allocation of flow

was made to Wyoming Section for the balance of the season. Diversions and allocation data are shown graphically in figures 9 and 10 for the two sections in this division. Reduction in diversions was not required in Wyoming until near mid-August which is well beyond the critical period of water application for irrigation in this area. These conditions were in marked contrast to those in 1961 when regulation was required throughout the season.

*Diversion in acre-feet per acre
June-September*

	1956	1958	1959	1960	1961*	1962*
Wyoming Section	5.40	4.00	3.83	2.99	2.16	5.82
Idaho Section**	2.61	2.54	2.52	2.30	1.72	3.26

*May-September

**Excludes flow passing Stewart Dam and flow diverted to Bear Lake.

3. 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 also may be made 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 1962.

4. 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 1962.

C. Storage

1. 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 except Woodruff Narrows (capacity, 28,000 acre-feet) were filled to capacity in 1962. Woodruff Narrows Dam was completed and began impounding water shortly after January 1, 1962. By late April, the annual Compact allocation of 18,240 acre-feet was stored plus an additional 4,000 acre-feet of water dedicated for fish propagation by winter release from

the reservoir. (See figure 5.) 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
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	23,455 ac-ft

2. Bear Lake

An irrigation reserve in Bear Lake is provided by article V of the Compact which provides further that the reserve will be increased by steps as additional storage is developed above the lake. By Commission resolution adopted April 30, 1962, the irrigation reserve was increased to include the waters of Bear Lake below elevation 5,914.15 feet (764,000 ac-ft).

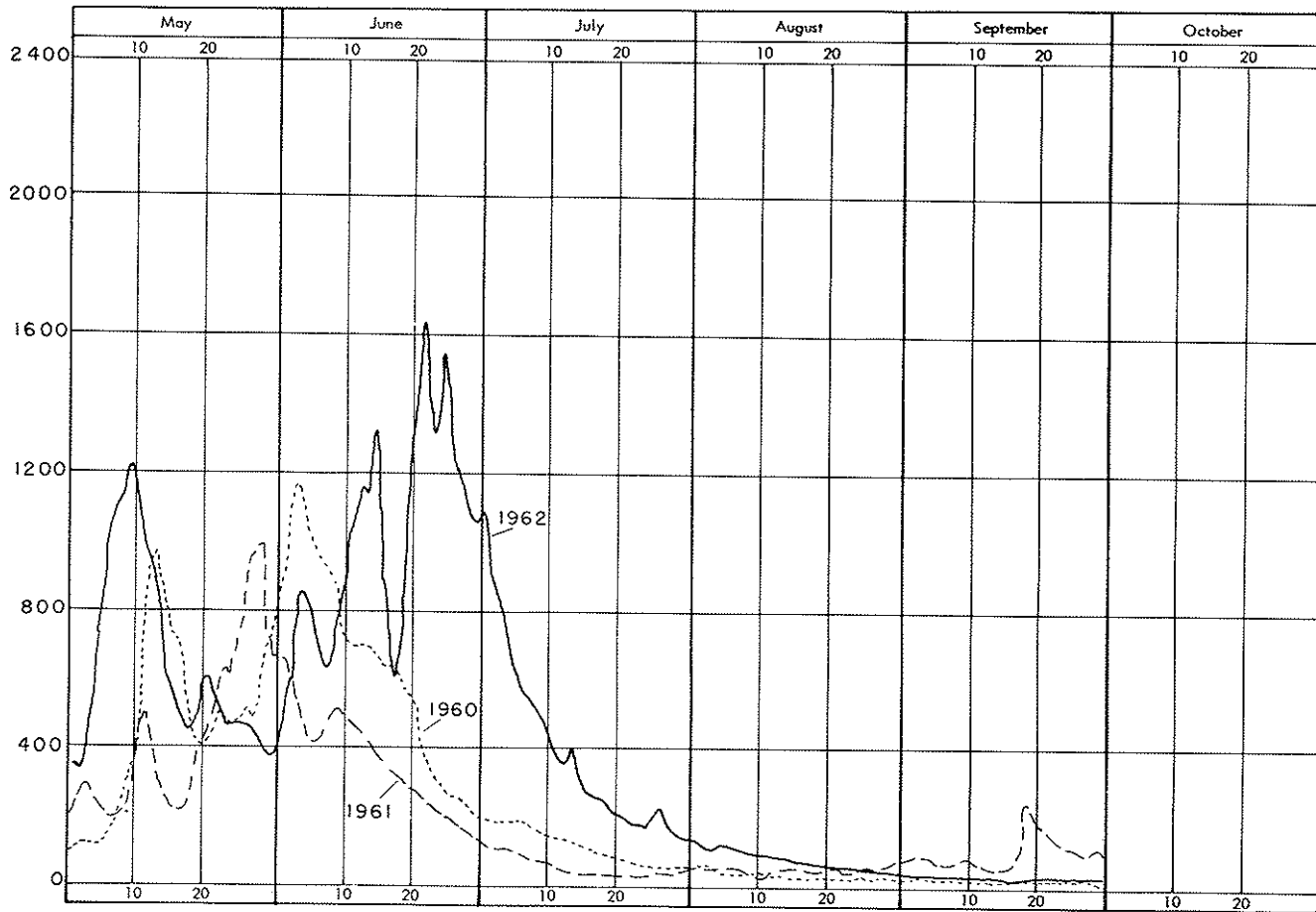
Bear Lake was below the irrigation reserve elevation throughout 1962 except May 12 to August 26. Article V provides that water of such reserve shall not be released solely for generation of power, except in emergency, but after release for irrigation it may be used for generation of power as it is conveyed to irrigation diversion works. Water was not released solely for generation of power at any time in 1962.

D. 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 presented to the Commission in 1962 included a number of filings for storage which would appropriate about 33,000 acre-feet for irrigation use principally in Franklin County, Idaho. In general, other applications were for ground water development to supplement irrigation supplies in the basin below Bear Lake. The extent of ground water use in recent years and its potential adverse effect on downstream users continued under study by a committee of State Engineers.

UPPER DIVISION - BEAR RIVER SUPPLY
CUBIC FEET PER SECOND



19

Figure 3

CENTRAL DIVISION - SMITHS FORK SUPPLY

CUBIC FEET PER SECOND

20

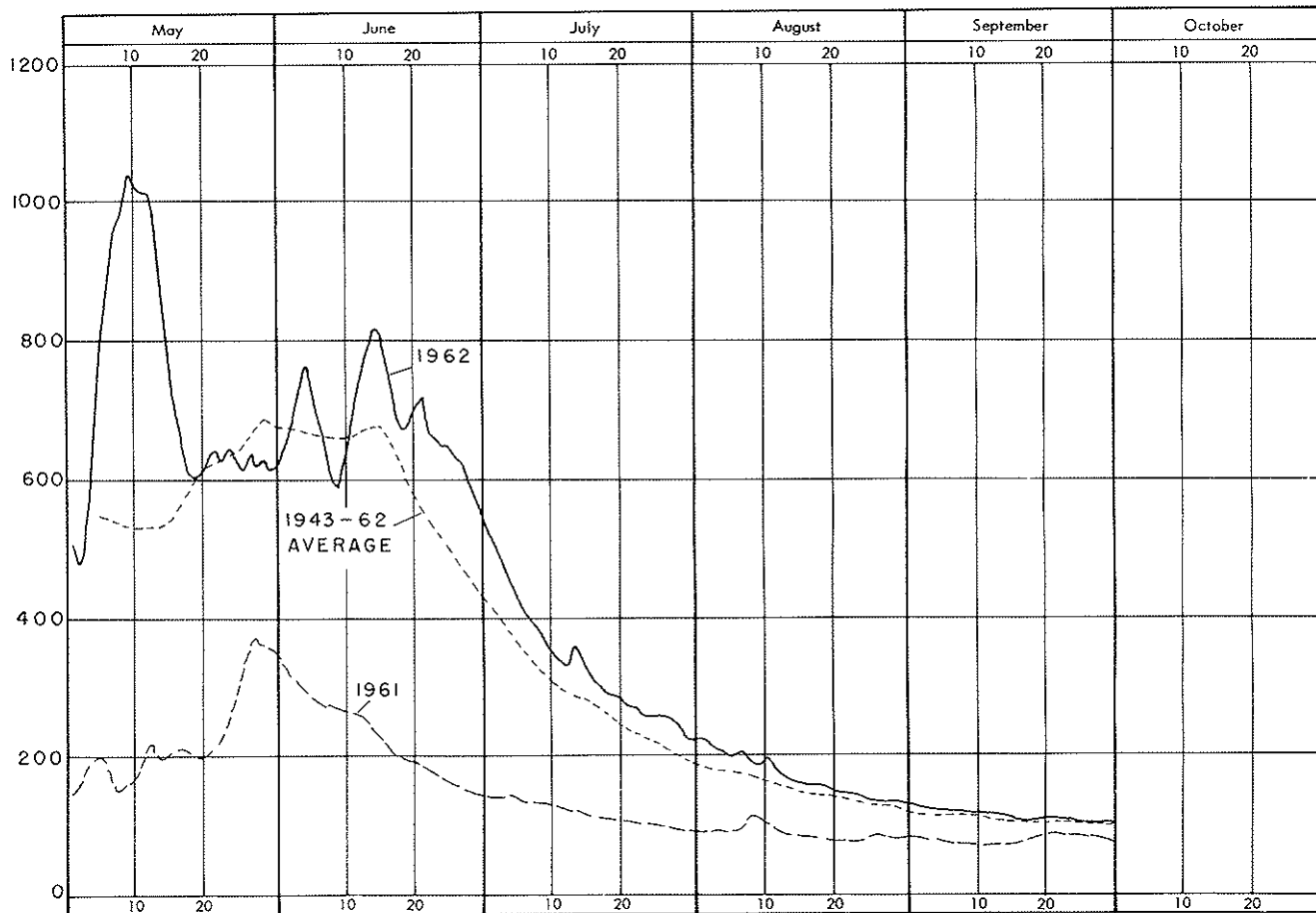


Figure 4

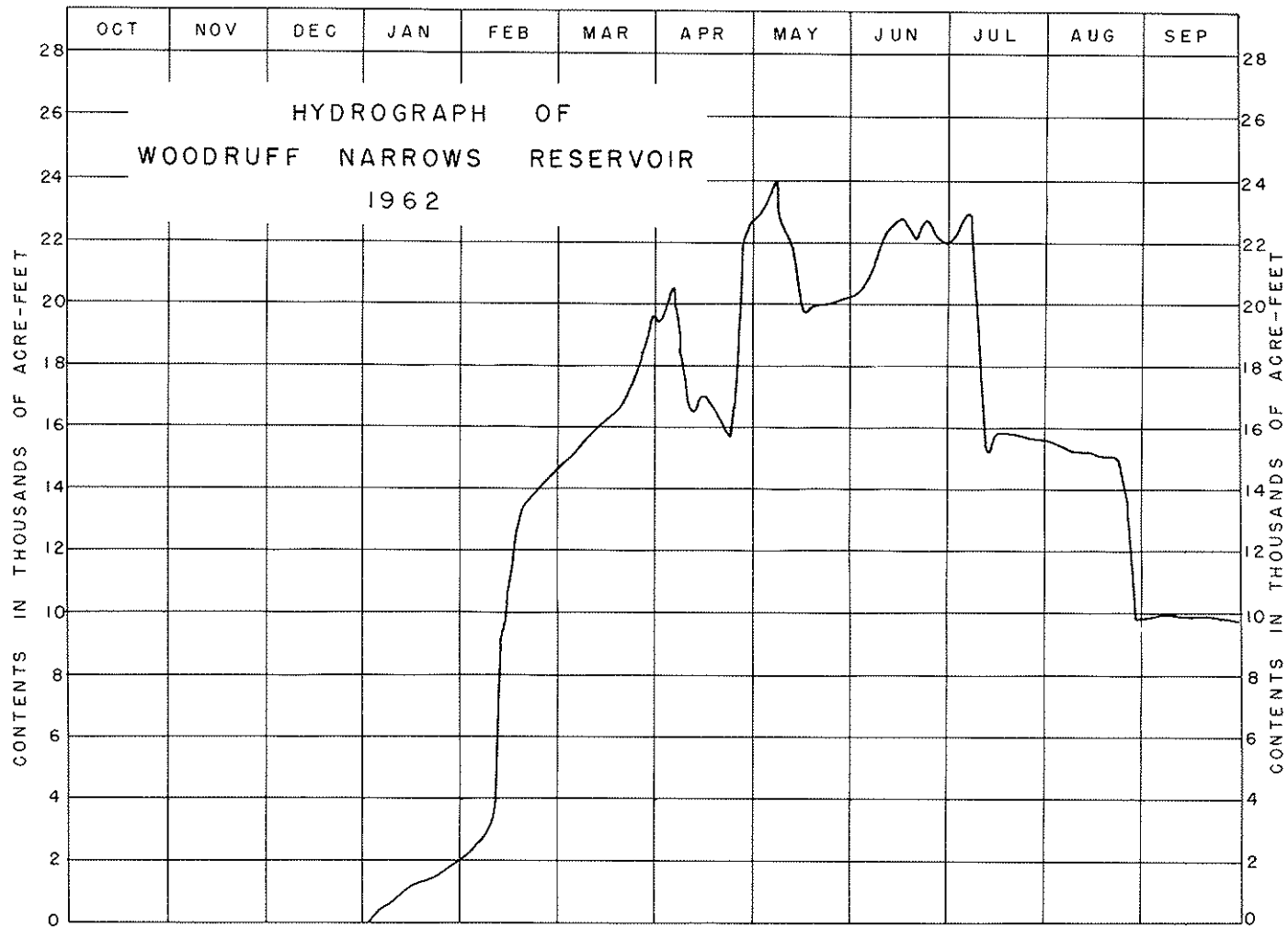


Figure 5

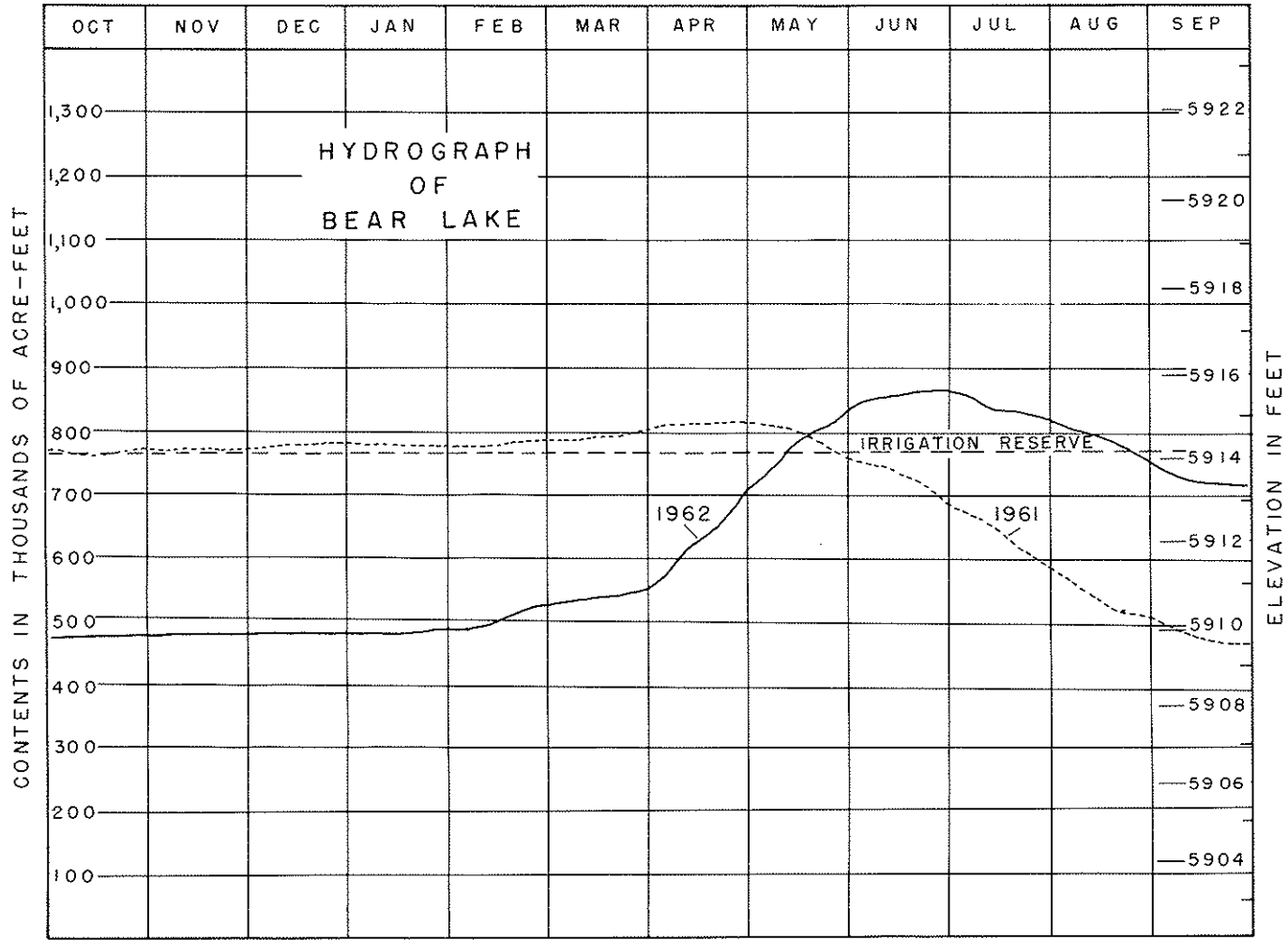


Figure 6

UPPER DIVISION - UPPER WYOMING SECTION
CUBIC FEET PER SECOND

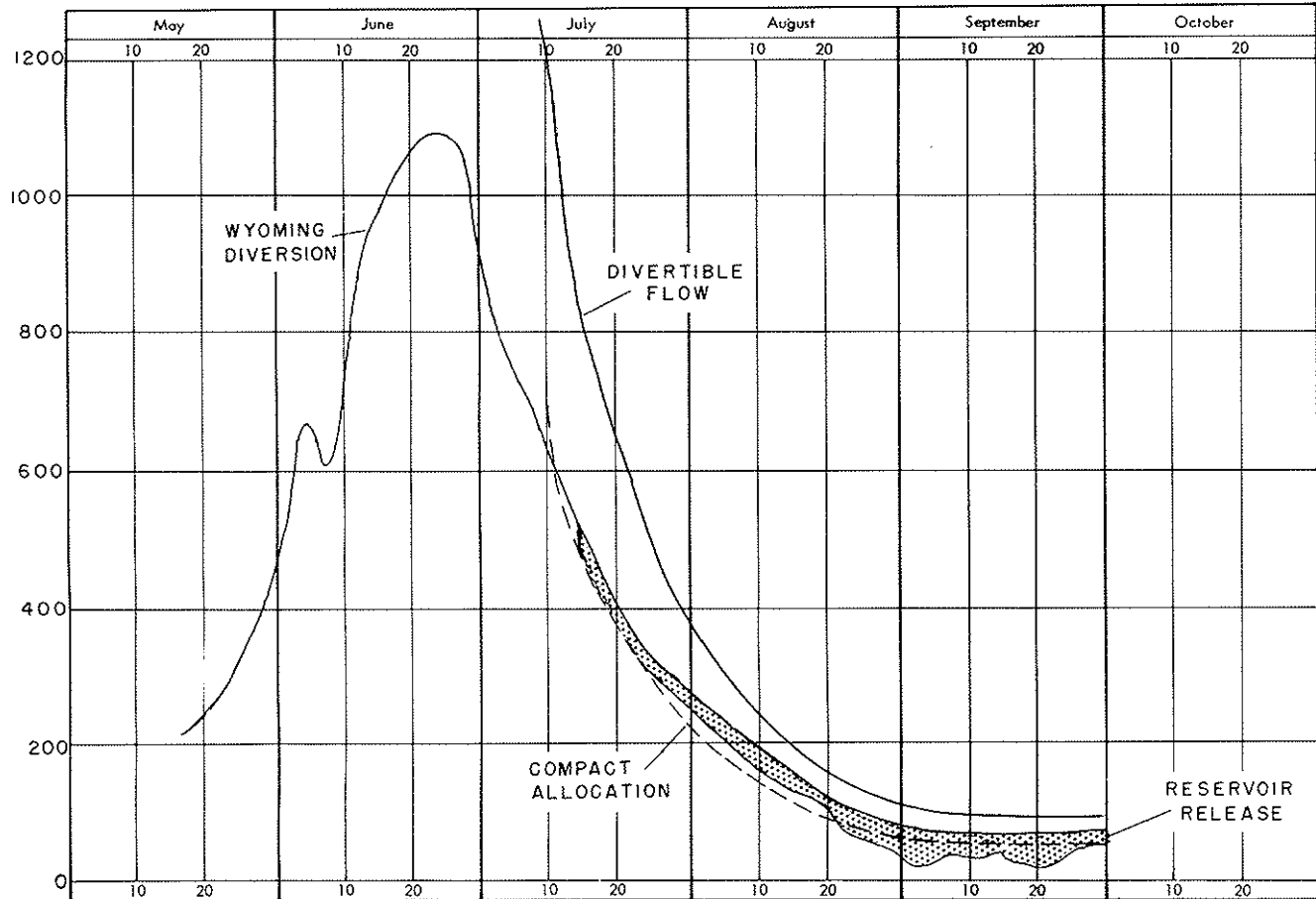


Figure 7

UPPER DIVISION - LOWER SECTIONS
CUBIC FEET PER SECOND

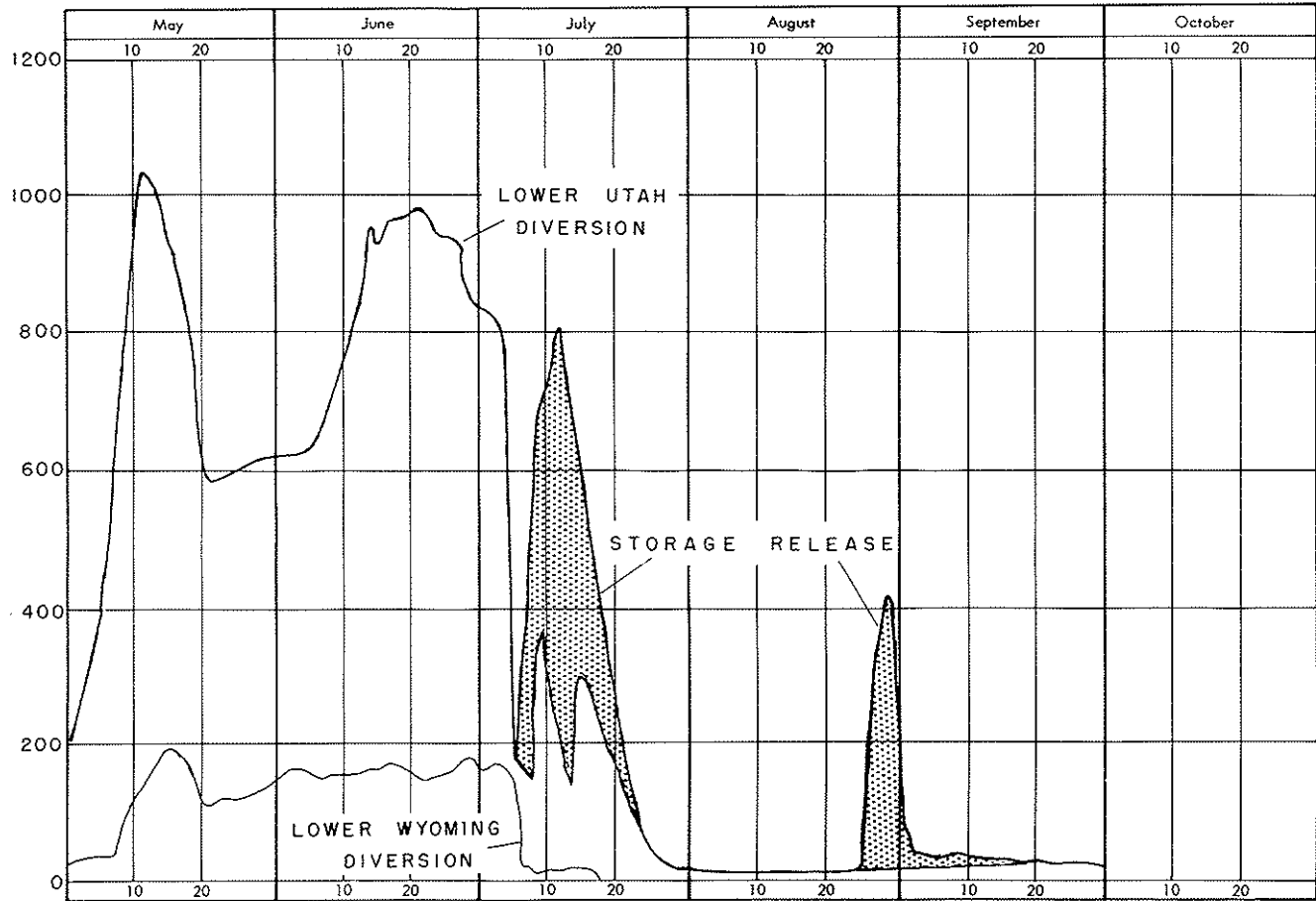


Figure 8

CENTRAL DIVISION - WYOMING SECTION

CUBIC FEET PER SECOND

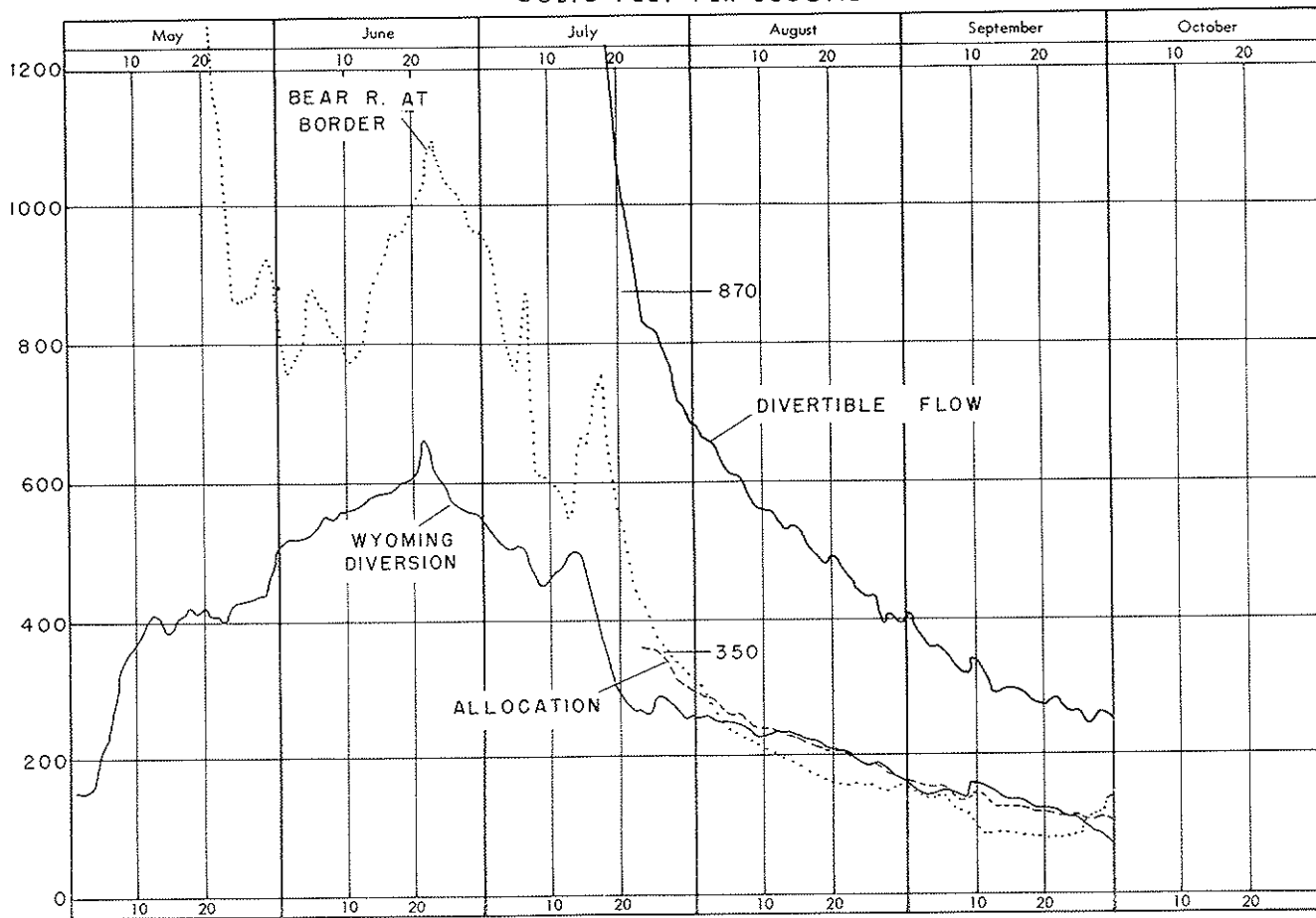


Figure 9

CENTRAL DIVISION - IDAHO SECTION
CUBIC FEET PER SECOND

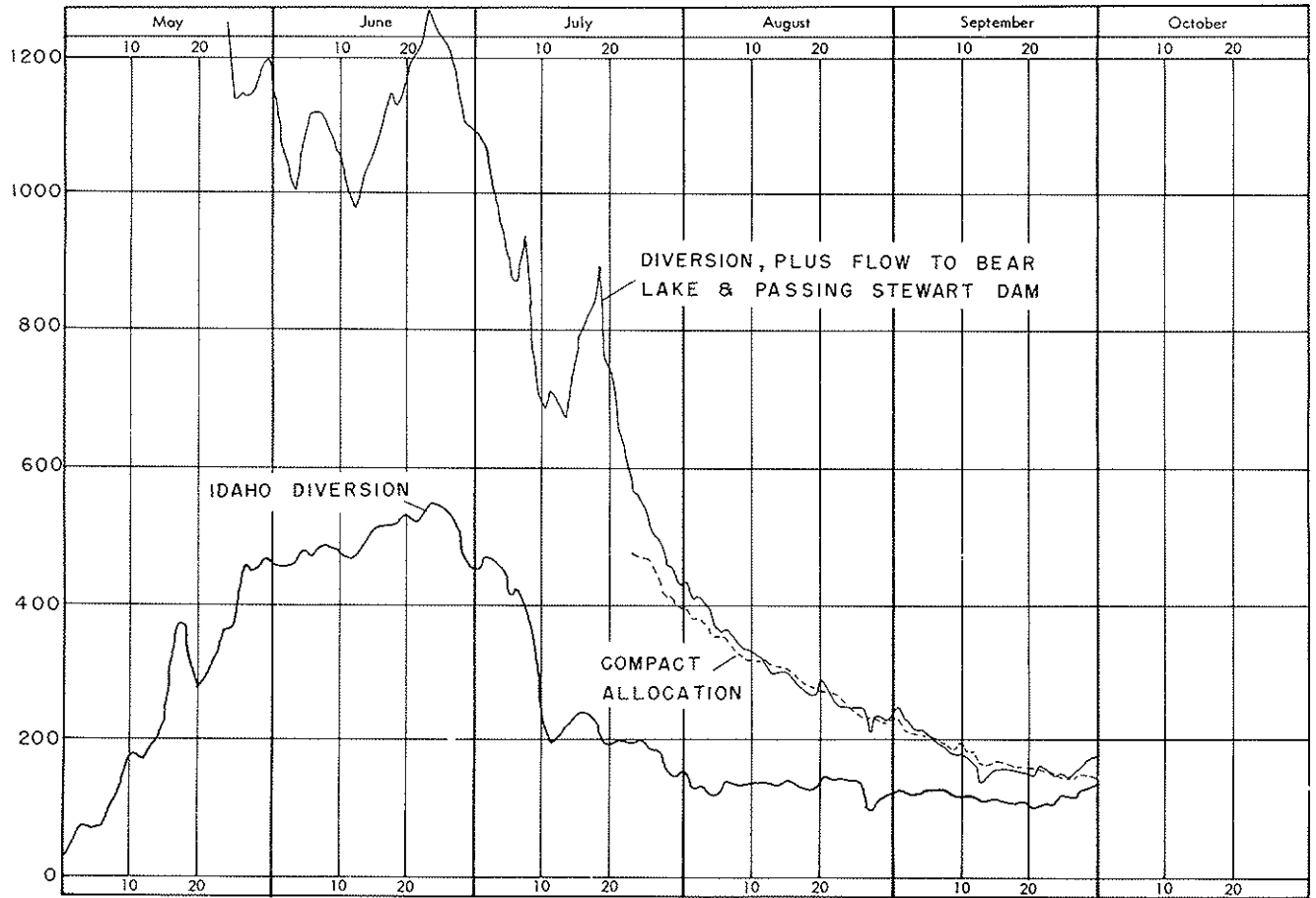


Figure 10

APPENDIX A

LYBRAND, ROSS BROS. & MONTGOMERY

CERTIFIED PUBLIC ACCOUNTANTS

WALKER BANK BUILDING

SALT LAKE CITY II

DAVIS 8-0141

September 11, 1962

BALTIMORE	HARTFORD	PORTLAND
BIRMINGHAM	HOUSTON	ROCKFORD
BOSTON	LOS ANGELES	ST. LOUIS
CHICAGO	LOUISVILLE	SALT LAKE CITY
CINCINNATI	MINNEAPOLIS	SAN FRANCISCO
CLEVELAND	NEW YORK	SEATTLE
COLUMBUS	PHILADELPHIA	SYRACUSE
DALLAS	PHOENIX	TULSA
DETROIT	PITTSBURGH	WASHINGTON

COOPERS & LYBRAND

IN AREAS OF THE WORLD
OUTSIDE THE UNITED STATES

RESIDENT PARTNERS
LINCOLN O. KELLY
LINCOLN S. KELLY
LAWRENCE S. OLSEN
CLIFFORD G. SNOW
JACK W. CUSHMAN

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

Gentlemen:

We have examined the financial records of the Bear River Commission for the fiscal year ended June 30, 1962. In connection therewith, we reviewed the financial transactions and examined the statement of revenue and expenditures for the year, the budget estimates and related expenditures, and verified the unexpended balance of cash by obtaining confirmation from the depository. Our examination was made in accordance with generally accepted auditing standards and included such auditing procedures as we considered necessary in the circumstances. Cash receipts have been properly accounted for and all disbursements were duly authorized and appeared to be regular. Except for the administrative expenses amounting to only \$1,067.70, all expenditures are made through and by the United States Geological Survey for purposes detailed in the budget.

As a result of our examination, we present this report which includes comments and explanatory detail and the following described statements:

Exhibit A--Statement of revenue and expenditures for the fiscal year ended June 30, 1962

Exhibit B--Statement of available revenue and appropriations thereof for the fiscal year, showing balances unexpended at June 30, 1962

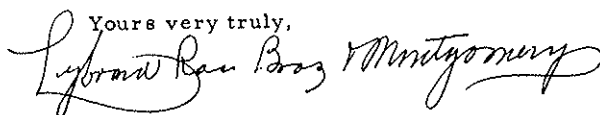
Schedule A-1--Statement of expenditures--stream-gauging program--allocated to the United States Geological Survey and to the Bear River Commission

GENERAL COMMENTS

The Bear River Commission, composed of ten Commissioners, three each representing the States of Wyoming, Utah, and Idaho, and one, the United States, was organized on April 5, 1958, and by-laws adopted April 26, 1958, as an interstate administrative agency to carry out provisions of the Bear River Compact. The Bear River Compact is an interstate pact which determines the rights and obligations of the signatory States of Wyoming, Idaho, and Utah with respect to waters of the Bear River. All expenses are to be charged to and paid by the three States on an equal basis.

On July 1, 1961, the Commission entered into a cooperative agreement with the Geological Survey, United States Department of the Interior, for operation and maintenance of a gauging-station network. 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 directly relate to the compact administration are wholly financed by the Commission. This is the same agreement that was in effect for the preceding fiscal year. Details of the financial transactions relating to this agreement for the fiscal year ended June 30, 1962, are presented in schedule A-1.

In our 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, 1962, and the results of the financial transactions for the period then ended, in conformity with generally accepted accounting principles applicable in the circumstances.

Yours very truly,


BEAR RIVER COMMISSION

Statement of Revenue and Expenditures
for the Fiscal Year Ended June 30, 1962

REVENUE:

State of Wyoming	\$ 8,900.00
State of Utah	8,900.00
State of Idaho	<u>8,900.00</u>

\$26,700.00

EXPENDITURES:

Commission's portion of direct expenses of the stream-gauging program, exhibit B:	
Personal services	\$17,770.00
Travel and subsistence	2,757.00
General office	1,406.50
Fiscal and administrative	1,084.00
Washington office charges	1,879.50
Miscellaneous	<u>53.00</u>
Total--schedule A-1	24,950.00

Administrative expenses:	
Stationery and postage	66.46
Treasurer's bond and audit	250.00
Transcript of minutes	70.00
Legal consultation	300.00
Purchase of 1947 Chevrolet truck .	300.00
Truck operation expenses	<u>81.24</u>
	1,067.70

26,017.70

EXCESS OF REVENUE OVER EXPENDITURES

<u>FOR THE FISCAL YEAR ENDED</u> <u>JUNE 30, 1962</u>	682.30
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<u>CASH ON HAND AT JULY 1, 1961</u>	<u>2,496.25</u>
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<u>CASH ON HAND AT JUNE 30, 1962--exhibit B</u> . . .	<u>\$ 3,178.55</u>
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Cash expenditures as above	\$26,017.70
Portion of expenditures incurred through stream-gauging program allocated and paid direct by United States Geological Survey . . .	<u>15,300.00</u>
Total expenditures as per exhibit B	<u>\$41,317.70</u>

BEAR RIVER COMMISSION

Statement of Available Revenue and Appropriations Thereof
for the Fiscal Year, Showing Balances Unexpended at June 30, 1962

	Available Revenue and Budgeted Estimates of Expenditures	Revenue Expended	Balance
<u>CASH REVENUES:</u>			
Balance--funds on hand at			
July 1, 1961	\$ 2,496.25	\$ 2,496.25	\$
Revenue receipts:			
State of Wyoming	8,900.00	8,900.00	. . . . .
State of Utah	8,900.00	8,900.00	. . . . .
State of Idaho	8,900.00	8,900.00	. . . . .
	<u>29,196.25</u>	<u>29,196.25</u>	<u>.</u>
 <u>FUNDS FURNISHED DIRECT BY</u>			
<u>UNITED STATES GEOLOGICAL</u>			
<u>SURVEY</u>			
	<u>15,300.00</u>	<u>15,300.00</u>	<u>.</u>
Total funds available	<u>44,496.25</u>	<u>44,496.25</u>	<u>.</u>
 <u>APPROPRIATION ACCOUNTS:</u>			
Stream gauging--schedule A-1	30,600.00	30,600.00	. . . . .
Personal services	7,300.00	7,300.00	. . . . .
Travel and subsistence	1,000.00	1,000.00	. . . . .
Fiscal unit charge	340.00	340.00	. . . . .
Washington office charge	740.00	740.00	. . . . .
General office expense	370.00	336.46	33.54
Printing annual report	595.00	. . . . .	595.00
Treasurer's bond and audit	250.00	250.00	. . . . .
Transcribing minutes	105.00	70.00	35.00
Legal consultant	300.00	300.00	. . . . .
Miscellaneous	400.00	381.24	18.76
	<u>42,000.00</u>	<u>41,317.70</u>	<u>682.30</u>
Unappropriated at July 1, 1961	<u>2,496.25</u>	<u>.</u>	<u>2,496.25</u>
	<u>44,496.25</u>	<u>41,317.70</u>	<u>3,178.55</u>
 <u>BALANCE</u>	 <u>\$</u>	 <u>\$ 3,178.55</u>	 <u>\$3,178.55</u>
 <u>FUNDS ON HAND AT</u>			
<u>JUNE 30, 1962</u>			
		<u>\$ 3,178.55</u>	<u>\$3,178.55</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, 1962

	<u>Allocable Expenditures</u>			<u>Expenses Charged Direct to Bear River Commission</u>	<u>Total Expenses to Bear River Commission</u>
	<u>Total</u>	<u>United States Geological Survey, 50 %</u>	<u>Bear River Commission, 50 %</u>		
Personal services .	\$20,940.00	\$10,470.00	\$10,470.00	\$7,300.00	\$17,770.00
Travel and subsistence	3,514.00	1,757.00	1,757.00	1,000.00	2,757.00
General office . .	2,273.00	1,136.50	1,136.50	270.00	1,406.50
Fiscal and administrative . . .	1,488.00	744.00	744.00	340.00	1,084.00
Washington office charge	2,279.00	1,139.50	1,139.50	740.00	1,879.50
Miscellaneous	<u>106.00</u>	<u>53.00</u>	<u>53.00</u>	<u>.....</u>	<u>53.00</u>
	<u>\$30,600.00</u>	<u>\$15,300.00</u>	<u>\$15,300.00</u>	<u>\$9,650.00</u>	<u>\$24,950.00</u>

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 1962 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 data as 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. Runoff 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

10-0115. Bear River near Utah-Wyoming State Line

Location.--Lat 40°58', Long 110°51', in SE¼ sec.30, T.3 N., R.10 E., on left bank just downstream from West Fork, 2.9 miles upstream from Utah-Wyoming State line.

Drainage area.--176 sq mi.

Records available.--July 1942 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 7,965 ft (from river-profile map).

Average discharge.--20 years, 183 cfs (132,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,920 cfs June 21 (gage height, 3.89 ft); maximum gage height, 4.20 ft June 20 (backwater from log jam); minimum discharge, 33 cfs Sept. 13-17, 1942-62; Maximum discharge, 2,800 cfs June 6, 1957 (gage height, 4.27 ft); minimum determined, 16 cfs Apr. 11, 1951, Nov. 5, 1954, Nov. 1, 1955, Oct. 30, 1956.

Remarks.--Records good except those for periods of ice effect which are fair. Two diversions above station for irrigation of about 200 acres above and 2,600 acres below station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	98	80	73		b40		55	348	510	802	126	42
2	88	78	66		40		55	338	644	833	113	42
3	83	78	53	b45	40	b42	55	410	650	720	115	42
4	82	82	66		42		55	571	690	335	129	40
5	79	66	69		b40		55	792	*759	586	118	40
6	73	89	61	42	b40	42	54	1,020	666	657	113	36
7	89	80		44	40	42	58	1,100	828	537	*106	36
8	73	75		44	40	42	54	1,120	651	503	101	36
9	82	74		40	40	b42	55	*1,230	825	484	98	36
10	*83	73	b60		44	b42	56	1,140	1,000	*404	101	36
11	88	68			54		61	1,030	1,070	370	96	*36
12	90	62			55		64	974	1,160	359	86	36
13	92	74		b44	48		74	875	1,130	404	82	35
14	98	82			46	b45	92	712	1,330	343	76	35
15	103	68			50		115	593	1,030	270	66	35
16	103	*66			47		140	523	712	265	66	33
17	98	74	b55		44		*173	463	600	261	64	35
18	90	78		*44	44	b47	214	446	736	244	61	36
19	73	62	(*)	44	b42	b47	274	490	1,120	206	61	35
20	73	61		48	b42	*b48	333	578	*1,380	206	61	36
21	71	59		b44	*42	48	343	614	1,630	191	61	42
22	73	76		b40	47	b48	370	543	1,430	183	64	44
23	66	66	b48	b40	42	48	433	471	1,300	*186	59	38
24	78	61		b40	b41	b49	537	471	1,850	180	55	36
25	66	59		b40	b40	51	628	477	1,260	206	54	38
26	80	56	48	42	b40	52	600	471	1,200	231	51	40
27	92	53		40	b40	55	510	464	*1,120	176	48	40
28	90	66		b40	b40	63	498	421	1,060	156	48	40
29	82	68	b45	b40	-----	b55	415	398	1,060	143	44	40
30	98	56		40	-----	b55	364	370	1,030	237	42	42
31	88	-----		b40	-----	b55	-----	421	-----	140	-----	-----
Total	2,597	2,100	1,716	1,331	1,210	1,448	6,766	19,894	30,351	10,999	2,407	1,140
Mean	83.8	70.0	55.4	42.9	33.2	46.7	226	642	1,012	355	77.6	38.0
Ac-ft	5,150	4,170	3,400	2,640	2,400	2,870	13,480	39,460	60,200	21,820	4,770	2,280

Calendar year 1961: Max 974 Min 25 Mean 118 Ac-ft 85,610
 Water year 1961-62: Max 1,630 Min 33 Mean 225 Ac-ft 162,600

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-9	2130	3.01	1,430	6-21	0230	3.89	1,920
6-14	0430	3.75	1,590				

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

BEAR RIVER BASIN

10-0157. Sulphur Creek above reservoir, near Evanston, Wyo.

BEAR RIVER BASIN

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

Location.--Lat 41°09', long 110°48' in SW $\frac{1}{4}$ sec.35, T.14 N., R.119 W., on right bank $1\frac{1}{2}$ miles downstream from Willow Creek, 2 miles upstream from Sulphur Creek Dam, and $11\frac{1}{2}$ miles southeast of Evanston.

Drainage area.--84 sq mi, approximately.

Records available.--December 1957 to September 1962.

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

Extremes.--Maximum discharge during year, 397 cfs Apr. 13 (gage height, 4.51 ft); maximum gage height, 5.56

ft Apr. 8 (backwater from ice); no flow Dec. 14-20.

1957-62: Maximum discharge, 360 cfs Apr. 18, 1958 (gage height, 5.07 ft), from rating curve extended above 100 cfs by logarithmic plotting; maximum gage height, that of Apr. 8, 1962; 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.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	0.6						11	30	18	8.0	3.2	0.2	
2	1.2						14	23	15	8.0	3.5	.1	
3	11						15	27	16	2.2	2.0	.1	
4	13						15	42	24	1.9	1.4	.1	
5	11						15	51	*24	1.9	1.0	.1	
6	11						15	84	18	1.6	.7	.1	
7	12						18	95	28	1.3	** .5	.1	
8	15						15	84	19	1.4	.5	.1	
9	17						15	*64	13	1.7	.4	.1	
10	*18						25	54	10	*1.6	.5	.1	
11	15						50	40	8.7	2.2	.5	** .1	
12	13						100	150	27	15	2.8	.5	.1
13	7.7						70	206	31	15	17	.4	.1
14	8.8						*50	162	30	12	33	.4	0
15	7.4						33	139	24	11	15	.4	0
16	7.1						30	90	20	14	14	.4	0
17	8.5						23	25	18	14	9.3	.5	0
18	8.3						25	48	17	9.6	4.9	.5	0
19	8.0						21	52	18	7.4	3.9	.5	0
20	6.5						20	54	16	8.3	3.0	.5	0
21	6.0							45	23	7.4	3.0	.5	.2
22	6.3							40	28	6.8	2.2	.5	.3
23	6.3							41	22	8.8	.7	.4	.3
24	6.5							55	23	5.7	1.2	.4	.2
25	6.5							68	33	4.6	1.2	.3	.2
26	5.4							90	40	5.2	2.4	.2	.2
27	6.0							44	48	3.0	3.5	.2	.2
28	5							57	45	1.3	3.0	.1	.3
29	5							42	44	1.4	2.6	.1	.3
30	4							*8	30	26	10	3.7	.1
31	3							8	18	4.1	.1	.1	.3
Total	251.9	55	31	31	430	73	1,666	1,125	347.2	155.3	21.5	4.0	
Mean	81.3	1.8	1	1	15.4	2.4	55.5	36.3	11.6	5.01	0.69	0.13	
Ac-ft	500	109	61	61	853	145	3,300	2,230	689	308	43	7.9	

Calendar year 1961 : Max 101 Min 0 Mean 3.76 Ac-ft 2,720
 Water year 1961-62: Max 206 Min 0 Mean 11.5 Ac-ft 8,310

* Discharge measurement made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Oct. 23, 24, Oct. 28 to Apr. 12 (no gage-height record Mar. 1-13). No gage height record Apr. 8-12, 16, 17.

BEAR RIVER BASIN

10-0159. Sulphur Creek below reservoir, near Evanston, Wyo.

Location.--Lat 41°09', long 110°49', in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.28, T.14 N., R.119 W., on left bank 400 ft downstream from Sulphur Creek Dam, 6.3 miles upstream from mouth, and 10 $\frac{1}{2}$ miles southeast of Evanston.

Drainage area.--68 sq mi, approximately.

Records available.--March 1958 to September 1962.

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

Extremes.--Maximum discharge during year, 77 cfs Apr. 15 (gage height, 2.71 ft); no flow Oct. 1 to Mar. 31.
1958-62: Maximum discharge, 164 cfs June 29, 1959 (gage height, 3.67 ft); no flow at times in each year.

Remarks.--Records good. Flow regulated by Sulphur Creek Reservoir (capacity, 4,600 acre-ft) completed December 1957. Records herein do not include flow over spillway of the dam.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							11	45	20	13	20	50
2							11	45	20	5.4	20	48
3							*11	45	20	5.7	20	48
4							12	45	20	5.7	21	46
5							12	45	*20	5.7	21	42
6							16	46	21	5.4	22	32
7							21	46	21	5.2	*22	32
8							20	46	20	5.2	23	32
9							20	*46	20	4.7	23	32
10	(*)						20	46	20	*4.4	23	32
11							20	45	20	4.2	23	*32
12							21	45	20	4.0	23	22
13							25	45	20	2.2	23	17
14					(*)		53	45	20	1.5	23	16
15							72	44	20	17	18	28
16							56	44	20	25	14	36
17							45	35	20	24	14	36
18							*45	31	21	20	14	37
19				(*)			45	31	22	17	14	39
20						(*)	45	28	17	17	14	42
21							44	20	19	17	14	42
22							44	20	16	17	21	41
23		(*)					44	20	17	17	30	41
24							44	20	17	17	29	26
25							45	20	18	17	28	14
26							45	20	19	17	29	15
27							45	20	20	17	29	16
28							45	20	19	18	32	15
29							45	20	19	18	31	15
30							45	20	18	18	31	15
31				(*)			45	20	18	18	30	15
								20	18	19	40	15
Total	0	0	0	0	0	0	1,033	1,066	580	361.3	708	940
Mean	0	0	0	0	0	0	34.4	34.5	19.3	12.3	22.9	31.3
Ac-ft	0	0	0	0	0	0	2,050	2,120	1,150	756	1,410	1,860

Calendar year 1961: Max 35 Min 0 Mean 4.19 Ac-ft 3,040
 Water year 1961-62: Max 72 Min 0 Mean 12.9 Ac-ft 9,350

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

BEAR RIVER BASIN

10-0195. Chapman Canal at State Line, near Evanston, Wyo.

Location.--Lat 41°24', long 111°02', in SE¼ sec.36, T.17 N., R.121 W., on left bank at highway bridge, 6½ miles downstream from headgates and 10 miles northwest of Evanston.

Records available.--April 1942 to September 1962 (prior to October 1944 irrigation seasons only). Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 6,570 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.--16 years (1944-62), 16.4 cfs (13,320 acre-ft per year).

Extremes.--1942-62: Maximum daily observed, 129 cfs Apr. 14, 1946; no flow at times each year.

Remarks.--Records fail. Canal diverts water from Bear River in NW¼ 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 Saloratus basin, Utah

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	87	2.3		0	0	16	60	62	84	14	0.1
2	32	90	*.8		0	0	12	*58	67	82	12	.1
3	30	81	0		0	0	8.2	56	69	78	9.8	0
4	21	72	0		0	0	8.4	58	78	73	8.4	0
5	16	91	0		0	0	5.4	63	73	87	11	0
6	10	87	0		0	0	1.6	72	64	64	12	0
7	8.7	74	0		0	0	1.6	83	*69	59	*12	0
8	12	85	0		0	0	.4	85	69	53	12	0
9	11	85	0		0	0	.4	99	71	55	14	0
10	15	85	0		0	0	0	*103	73	55	19	0
11	*18	79	0		0	0	0	95	76	*48	21	0
12	21	85	0		0	0	0	86	84	40	15	0
13	25	883	0		0	0	0	76	82	42	14	0
14	51	*81	0		a1	0	.1	72	81	67	12	0
15	58	a78	0		(**)	0	.1	67	83	68	11	0
16	53	a76	0		0	0	.1	64	79	83	9.0	0
17	56	*a73	0		0	0	0	60	75	56	5.9	0
18	55	62	0		0	0	12	70	73	52	4.1	0
19	43	41	0		0	0	36	67	79	44	2.7	0
20	40	3.9	*0		0	*0	36	69	84	37	1.1	0
21	36	11	0		0	0	39	69	67	27	.5	0
22	33	56	0		0	0	40	74	85	18	.3	0
23	36	42	0		0	0	39	72	84	14	.1	.5
24	37	42	0		0	0	39	66	81	12	0	2.5
25	52	46	0		0	0	44	66	76	12	0	5.9
26	66	36	0		0	a18	61	66	79	14	0	3.7
27	70	35	0		0	a18	70	67	78	21	0	1.0
28	84	36	0		0	a18	71	67	76	15	0	2.3
29	91	32	0		-----	a18	69	67	81	13	0	1.6
30	61	29	0		-----	*a16	65	64	86	13	.3	2.4
31	70	-----	0		-----	13	-----	61	-----	13	.2	-----
Total	1,261.7	1,863.9	3.1	0	7	103	673.3	2,216	2,306	1,359	221.4	20.1
Mean	40.7	62.1	0.10	0	0.2	3.32	22.4	71.5	76.5	43.8	7.14	0.67
Ac-ft	2,500	3,700	6.1	0	14	204	1,340	4,400	4,570	2,700	439	40

Calendar year 1961: Max 104 Min 0 Mean 25.1 Ac-ft 18,170
 Water year 1961-62: Max 103 Min 0 Mean 27.5 Ac-ft 19,910

* Discharge measurement or observation of no flow made on this day.
 ** Field estimate made on this day.
 a No gage-height record.

BEAR RIVER BASIN

10-0201. Bear River above reservoir, near Woodruff, Utah

Location.--Lat 41°26'05", long 111°01'00", in NW1/4 sec.29, T.17 N., R.120 W., in Wyoming on right bank 9.3 miles upstream from Woodruff Narrows Dam and 10 miles southeast of Woodruff.

Drainage area.--780 sq mi, approximately.

Records available.--October 1961 to September 1962.

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

Extremes.--Maximum discharge during year, 1,420 cfs May 10 (gage height, 4.44 ft); maximum gage height, 5.88 ft Mar. 28 (backwater from ice jam); minimum discharge, 1.5 cfs Sept. 13.

Remarks.--Records good except those for period of ice effect, which are fair. Diversions for irrigation of about 43,500 acres above station.

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

0.9	0	2.1	142
1.0	3.0	2.5	296
1.1	7.0	3.0	542
1.2	17	4.0	1,130
1.5	35	4.4	1,460
1.8	71		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	13	17	40				574	475	380	837	10	5.0	
2	10	20	50				*713	*420	420	495	9.5	5.4	
3	10	19					890	405	532	410	8.5	5.0	
4	9.0	18					940	490	*708	342	8.0	4.2	
5	7.5	17					309	653	741	287	7.5	3.6	
6	7.0	16					*691	872	616	233	*7.5	3.0	
7	7.5	15					691	1,140	584	190	7.5	2.4	
8	10	14					568	*1,310	553	179	7.5	2.1	
9	12	18					455	1,290	542	168	10	1.8	
10	16	20					*371	1,360	648	133	17	*2.1	
11	20	18					405	1,350	817	434	18	1.8	
12	25	17					460	1,210	884	68	22	1.8	
13	26	17					590	1,020	934	68	22	1.5	
14	19	19					637	878	946	130	19	1.8	
15	14	18					805	713	1,060	165	16	2.1	
16	13	15					730	558	860	116	12	2.4	
17	13	*11					574	480	691	84	11	2.4	
18	13	11					511	420	616	65	10	2.4	
19	12	20					490	380	*702	48	8.5	2.4	
20	12	25					542	405	915	42	8.0	2.4	
21	12	40					590	490	1,060	33	7.5	4.6	
22	10	70					616	579	1,150	25	6.6	5.4	
23	10	70					600	495	1,050	20	5.8	4.2	
24	10						859	425	994	19	5.4	4.6	
25	10						54	80	782	415	988	17	5.4
26	13						51	150	872	465	*903	12	6.6
27	15						50	300	770	455	758	*13	5.4
28	14						50	540	702	470	664	13	5.0
29	13						55	690	690	460	622	13	5.7
30	13							400	537	430	664	12	7.0
31	12							500	371		10	5.4	
Total	401.0	665	1,720	1,505	5,980	3,675	19,414	20,884	23,082	4,141	304.2	118.4	
Mean	12.9	22.2	55.5	48.5	214	119	647	674	769	134	9.81	3.95	
Ac-ft	795	1,320	3,410	2,990	11,860	7,290	38,510	41,420	45,780	8,210	603	235	

Calendar year 1961: Max - Min - Mean - Ac-ft -
 Water year 1961-62: Max 1,360 Min 1.5 Mean 224 Ac-ft 162,400

* Discharge measurement made on this day.
 Note.--Stage-discharge relation affected by ice Oct. 29 to Mar. 31 (no gage-height record Jan. 21-29, Mar. 11-19).

BEAR RIVER BASIN

10-0203. Bear River below reservoir, near Woodruff, Utah

Location.--Lat 41°30'20", long 111°00'50", in NW¼NW¼ sec.32, T.18 N., R.120 W., in Wyoming, on right bank, 1,100 ft below Woodruff Narrows Dam, 1.6 miles upstream from Salt Creek, 5.4 miles upstream from Wyoming-Utah State line, and 7.7 miles east of Woodruff.

Drainage area.--610 sq mi, approximately.

Records available.--October 1961 to September 1962.

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 175 ft upstream at same datum.

Extremes.--Maximum discharge during year, 1,530 cfs May 10 (gage height, 6.32 ft); no flow July 4, 5.

Remarks.--Records fair prior to Jan. 7, good thereafter. Flow regulated by Woodruff Narrows Reservoir beginning January 1962 (capacity, 26,000 acre-ft). Diversions for irrigation of about 43,500 acres above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a14	22	60	50	13	14	710	267	453	691	11	22
2	a12	27					13	14	710	*511	453	687	4.0	22
3	a11	24	70	(*)	*11	14	710	555	453	195	3.6	22
4	a11	24					10	14	710	551	*456	0	4.6	20
5	a10	23			10	14	714	551	466	0	5.5	*22
6	a 9	24	35	25	10	14	*714	636	511	252	*5.8	26
7	a10	22			1/4	10	14	933	885	564	544	*14	27
8	a11	21	75	1/4	10	14	1,080	*999	602	555	19	27
9	a13	26			12	10	*16	1,070	1,280	602	*550	19	27
10	*16	28	(*)	12	10	22	*870	1,450	628	634	20	*17
11	27	28			12	6	21	642	1,510	668	715	20	2.0
12	35	28	62	12	6	22	637	1,500	742	658	21	*2.0
13	32	26			12	6	22	633	1,490	660	686	21
14	33	22	62	12	*6	21	633	1,390	665	529	21	1.8
15	19	24			12	6	20	633	1,150	890	.4	21
16	16	20	75	12	6	20	633	874	885	5.8	21	1.6
17	15	*20			12	6	20	633	606	880	12	18
18	14	16	(*)	12	6	20	628	535	875	*30	16	1.5
19	14	18			*12	6	*20	628	468	*870	60	16
20	14	30		12	6	19	624	428	865	59	16	5.8
21	13	45	62	12	6	19	678	428	870	56	16	5.5
22	10	43			12	6	22	758	431	905	56	16	5.5
23	10		62	12	6	21	753	431	961	46	16	5.5
24	10				12	14	19	726	431	1,000	17	16	5.2
25	a10			12	14	19	324	431	1,050	17	233	4.6
26	a14	32	58	13	14	20	4.6	442	*1,050	17	394	84.6
27	a17					13	14	102	5.2	440	930	*16	*488	85.2
28	a16		58	13	14	233	130	449	682	15	586	5.2
29	a14				13	13	*430	316	453	691	15	467	5.2
30	a14		58	13	13	710	316	453	696	14	23	5.5
31	15		53	13	13	710	-----	453	-----	14	23	-----
Total	489	820	1,595	562	255	2,660	16,518.8	22,507	22,433	7,185.9	2,575.5	308.4
Mean	15.8	27.3	61.1	18.1	9.1	85.8	617	728	748	232	83.1	10.3
Ac-ft	970	1,650	3,760	1,110	508	5,260	36,730	44,640	44,500	14,250	5,110	612
Calendar year 1961: Max	--	--	Min --	Mean --	Ac-ft --							
Water year 1961-62: Max	1,510	Min 0	Mean 220	Ac-ft 159,100								

* Discharge measurement made on this day.

a Doubtful or no gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 20 to Mar. 8 (no gage-height record Jan. 29 to Mar. 9).

BEAR RIVER BASIN

10-0265. Bear River near Randolph, Utah

Location.--Lat 41°46', long 111°06', in SE 1/4 sec. 7, T.16 N., R.8 E., on left bank 3.5 miles upstream from Twin Creek, 4.8 miles upstream from Utah-Wyoming State line, and 11 miles northeast of Randolph.

Drainage area.--1,640 sq mi, approximately.

Records available.--October 1943 to September 1962. Monthly discharge only for some periods, published in WSP 1314.

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

Average discharge.--19 years, 181 cfs (131,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,900 cfs Mar. 30 (gage height, 8.07 ft); minimum, 1.6 cfs Nov. 12. 1943-62: Maximum discharge, 2,660 cfs May 8, 1952 (gage height, 8.80 ft); minimum, that of Nov. 12, 1961.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 94,800 acres above station. Flow regulated by Woodruff Narrows Reservoir beginning January 1962 (capacity 28,000 ac-ft).

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.8						1,580	343	224	423	65	18
2	9.6						*1,670	333	238	418	82	16
3	9.2			28			1,740	363	263	385	78	15
4	9.2						1,820	421	282	353	74	14
5	11	12			16		1,440	397	231	272	71	14
6							1,200	363	240	220	70	14
7	9.8						1,080	328	*269	195	68	13
8	22	8.0					983	355	280	202	*64	13
9	22	6.8					1,020	343	263	255	60	12
10	24	8.4			24		1,070	*361	267	231	59	12
11	*24	5.1			60	52	1,060	417	253	*220	58	12
12	24	4.5	6		200		899	484	295	231	58	*11
13	26	5.4			700		768	582	329	278	67	11
14	28	5.4			870		729	612	367	333	53	10
15	22	5.1			840		693	658	373	440	50	10
16	22	5.4			600		673	667	445	391	49	10
17	22	6.8			460		639	582	470	386	50	10
18	22	6.0	*33		350		612	466	477	272	48	10
19	22	6.4		16	260		594	395	503	231	47	10
20	23	6.8			200		592	333	*489	197	47	9.6
21	23	*6.4			180	(*)	594	299	486	172	47	9.6
22	22	8.0			120	70	607	303	501	155	45	9.2
23	22	7.2			100	82	636	297	498	141	45	9.2
24	22	6.4			80	88	647	288	520	134	43	8.2
25	24	6.0			70	99	641	255	572	126	40	8.2
26	22	5.4			62	148	625	233	600	117	36	8.2
27	20	4.8			54	500	381	233	617	114	18	9.2
28	19	4.8			52	1,340	290	240	607	107	14	11
29	19	5			-----	1,350	253	252	525	89	13	10
30	17	5			-----	1,640	285	280	448	93	15	9.6
31	12	-----			-----	1,780	-----	261	-----	90	19	-----
Total	596.4	221.1	658	568	5,006	8,188	25,631	11,714	11,897	7,168	1,563	340.0
Mean	19.2	7.37	21.2	18.3	179	264	854	378	397	231	50.4	11.3
Ac-ft	1,180	439	1,310	1,130	9,930	16,240	50,840	23,230	23,600	14,220	3,100	674
Calendar year 1961: Max	180	Min 2.2			Mean 20.9	Ac-ft 15,120						
Water year 1961-62: Max	1,780	Min 4.5			Mean 201	Ac-ft 105,900						

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31 to Nov. 7, Nov. 29 to Mar. 27 (no gage-height record Dec. 7-17, Dec. 28 to Jan. 30, Feb. 11-15, and Feb. 22 to Mar. 21). No gage-height record Sept. 4-12.

BEAR RIVER BASIN

10-0285. Bear River below Pixley Dam, near Cokeville, Wyo.

Location.--Lat 41°56'20", long 110°59'05", in SE1/4SE1/4 sec.25, T.23 N., R.120 W., 800 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 1952 to September 1956, May 1958 to September 1962 (irrigation seasons only). Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 8,185 ft (from river-profile map). Oct. 31, 1941, to Nov. 30, 1943, at site 200 ft downstream at different datum.

Average discharge.--6 years (1941-43, 1952-56), 137 cfs (99,180 acre-ft per year).

Extremes.--Maximum discharge during season, 659 cfs May 18 (gage height, 5.93 ft); minimum daily recorded, 16 cfs Sept. 16.
1941-43, 1952-56, 1958-62: Maximum daily discharge, 2,300 cfs Mar. 25, 1956; minimum daily recorded, 0.3 cfs Aug. 21, 1961.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Natural flow of stream affected by diversions for irrigation and return flow from irrigated areas. No diversion between station and Collett Creek Branch of Smiths Fork.

Discharge, in cubic feet per second, May to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								110	148	350	110	26
2								130	140	334	102	26
3								150	139	328	100	25
4								170	148	312	96	24
5								160	156	476	91	24
6								145	167	346	89	23
7								135	179	272	85	23
8								135	*179	236	*83	23
9								134	181	254	81	22
10								130	179	291	78	22
11								171	181	265	65	21
12	†33							198	179	*252	74	21
13								240	181	269	70	*21
14								304	189	306	65	20
15								499	222	380	62	19
16								621	249	459	62	18
17								614	276	382	60	19
18								652	310	314	60	20
19								608	328	280	59	20
20								500	348	205	59	20
21								325	364	184	58	20
22								240	360	171	57	20
23								200	352	167	55	21
24								170	350	161	54	21
25								150	348	150	62	22
26								135	340	140	50	21
27								130	352	137	46	21
28								135	362	134	38	25
29								140	372	151	31	26
30								150	368	122	28	26
31								163		115	27	-----
Total								7,745	7,647	7,942	2,057	660
Mean								250	255	256	66.4	22.0
Ac-ft								18,360	18,170	18,750	4,080	1,310

Calendar year : Max Min Mean Ac-ft
The season : Max -- Min -- Mean -- Ac-ft 51,670

* Discharge measurement made on this day.

† Result of discharge measurement.

Note.--No gage-height record May 1-8, 20-30, July 30 to Aug. 8, Aug. 11 to Sept. 11.

BEAR RIVER BASIN

10-0320. Smiths Fork near Border, Wyo.

Location.--Lat 42°17', long 110°52', in NW¼ sec.33, T.27 N., R.118 W., on left bank 4½ miles upstream from Howland Creek, 6 miles downstream from Hobble Creek, and 16 miles northeast of Border.

Drainage area.--165 sq mi.

Records available.--May 1942 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 6,650 ft (from topographic map). Prior to Oct. 16, 1945, at site 0.8 mile downstream at different datum.

Average discharge.--20 years, 190 cfs (137,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,030 cfs May 9 (gage height, 4.02 ft); minimum, 43 cfs Mar. 12. 1942-62: Maximum discharge, 1,500 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, 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)
(Shifting-control method used July 11-15)

1.5	49	2.7	345
1.8	85	3.0	471
2.2	169	4.0	1,080

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	69	64			b61	64	*503	650	512	222	324
2	66	69	64			b64	69	476	675	289	208	321
3	66	b66	66		b58	b64	75	503	722	462	206	119
4	66	b60	b54			b64	80	516	765	441	199	119
5	66	b64	b62			b64	88	778	716	415	196	117
6	69	b64			b58	b60	63	393	679	403	199	117
7	73	b64			58	60	68	359	633	390	190	115
8	73	b65			58	60	83	978	*594	378	187	115
9	70	b66			59	58	82	1,040	589	361	*161	115
10	71	b65			63	59	*82	1,020	827	345	193	115
11	70	b65			75	59	85	*1,010	691	333	178	113
12	*69	b64			82	68	95	1,010	753	*326	169	111
13	65	b60			78	b56	109	978	784	361	164	*109
14	65	b62			75	b58	145	874	818	345	158	109
15	65	*b62		b58	74	b58	206	784	809	316	156	107
16	65	b61			66	b60	279	703	746	302	153	107
17	64	b61		(*)	65	b61	353	662	697	295	153	107
18	64	b58	b62		65	60	428	610	667	283	153	105
19	64	b62			63	59	512	598	673	283	147	105
20	63	b62	(*)		*b60	60	616	610	697	276	145	103
21	63	64			62	58	605	633	*716	268	142	107
22	66	b66			63	57	552	638	662	264	142	105
23	64	69			65	58	610	627	656	261	140	103
24	68	66			63	58	697	644	644	257	137	101
25	65	68			b62	57	716	627	644	254	133	101
26	68	64			b62	56	772	610	627	254	128	101
27	70	64			b58	69	740	638	621	250	130	101
28	73	64			b60	63	790	616	594	243	130	103
29	69	b64			-----	64	644	627	567	229	130	107
30	70	b64			-----	62	557	610	537	219	128	101
31	74	-----			-----	64	-----	616	-----	219	128	-----
Total	2,091	1,922	1,932	1,798	1,769	1,859	10,298	22,486	20,249	10,036	5,026	3,283
Mean	67.5	64.1	62.3	56.0	63.9	60.0	343	725	675	324	162	109
Ac-ft	4,150	3,810	3,830	3,570	3,550	3,690	20,430	44,600	40,160	19,910	9,970	6,510
Calendar year 1961:Max		361	Min	-	Mean	99.2	Ac-ft	71,800				
Water year 1961-62:Max		1,040	Min	-	Mean	227	Ac-ft	164,200				

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

BEAR RIVER BASIN

10-0395. Bear River at Border, Wyo.

Location.--Lat 42°11', long 111°03', in NE¼ sec.15, T.14 S., R.46 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.--2,490 sq mi, approximately.

Records available.--October 1957 to September 1962.

Gage.--Water-stage recorder. Datum of gage is 6,051.63 ft above mean sea level, unadjusted.

Average discharge.--25 years, 389 cfs (261,600 acre-ft per year).

Extremes.--Maximum discharge during year, 3,360 cfs Apr. 3 (gage height, 8.18 ft); minimum, 69 cfs Oct. 6. 1957-62: Maximum discharge, 5,680 cfs May 11, 1952 (gage height, 8.89 ft); minimum daily, 30 cfs Aug. 16-22, 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 tables, except periods of ice effect (gage height in feet,
and discharge, in cubic feet per second)
(Shifting-control method used Mar. 25 to Apr. 10, Apr. 21 to May 29)

Oct. 1 to Dec. 3		Dec. 4 to Sept. 30	
0.8	58	1.1	62
.9	73	1.2	96
1.4	152	1.5	144
1.5	178	2.2	281
		3.0	484
		4.2	900
		5.8	1,610
		7.0	2,200
		8.0	3,010
		8.3	3,300

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	122	127			230	1,900	1,340	756	904	296	149
2	82	122	117			210	*2,810	1,230	761	852	281	149
3	72	114	127	120		200	3,290	1,170	790	805	263	148
4	70	122	120			190	2,840	1,180	868	776	248	137
5	72	117	105		110	185	2,640	1,270	880	758	236	125
6	70	129	110				2,520	1,400	852	876	234	124
7	75	152	105				2,470	1,460	848	694	224	124
8	79	168	106	130		160	2,200	1,500	*813	612	218	116
9	86	162	105		115		1,960	1,420	802	599	*210	102
10	87	150	100		125		1,780	1,320	772	599	208	96
11	107	150	85		130		1,650	1,320	776	583	205	88
12	*102	124	90		250		1,640	1,300	809	*539	195	90
13	92	136	92	140	400		1,660	1,320	860	593	193	*89
14	93	142	95		700		1,660	1,320	888	666	190	88
15	93	*133	105		1,000	175	1,630	1,290	924	656	186	89
16	95	136	110		1,200		1,800	1,420	960	711	178	88
17	88	115	115	(*)	1,100		1,580	1,410	948	756	173	86
18	61	115	120		1,050		1,540	1,420	956	658	169	88
19	61	138	115		1,000		1,540	1,380	984	605	166	86
20	61	146	120	120	950		1,580	1,260	1,010	551	160	86
21	86	138	125		750	185	1,560	1,170	*1,040	481	158	89
22	88	129	130		600	*185	1,650	1,120	1,090	444	157	90
23	93	146	120		500	185	1,600	976	1,060	427	155	89
24	99	120	120		400	185	1,600	864	1,030	400	157	89
25	110	117	115		350	201	1,640	856	1,020	377	158	98
26	110	125			320	210	*1,700	864	1,010	360	153	116
27	114	124			280	253	1,740	864	984	348	149	116
28	124	112	120	100	250	435	1,780	912	964	345	146	121
29	124	109			-----	733	1,720	924	960	321	130	136
30	117	122			-----	912	1,520	884	956	322	158	142
31	NA	-----		110	-----	1,130	-----	813	-----	301	155	-----
Total	2,658	3,935	3,493	3,760	12,350	8,279	57,080	36,957	27,373	17,920	5,937	3,235
Mean	92.2	131	113	121	441	267	1,903	1,192	912	578	192	108
Ac-ft	5,670	7,800	6,930	7,480	24,500	16,420	113,200	73,300	54,290	35,540	11,780	6,420

Calendar year 1961: Max 300 Min 31 Mean 117 Ac-ft 85,040
 Water year 1961-62: Max 3,290 Min 70 Mean 502 Ac-ft 363,300

* Discharge measurement made on this day.
 Note.--Stage-discharge relation affected by ice Nov. 17, 18, 23; Dec. 4 to Mar. 24 (no gage-height record Feb. 19 to Mar. 22).

BEAR RIVER BASIN

10-0460. Rainbow inlet canal near Dingle, Idaho

Location.--Lat 42°13'00", long 111°17'30", in SE¼ sec.3, T.14 S., R.44 E., on left bank 1½ miles west of Dingle and 1¾ miles downstream from headworks at Stewart Dam.

Records available.--January 1922 to September 1962. Monthly discharge only prior to October 1945, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 5,950 ft (from topographic map). Prior to Oct. 1, 1923, at Site 300 ft downstream at different datum. Oct. 1, 1923, to Oct. 27, 1944, at site half a mile downstream at different datum.

Average discharge.--40 years, 297 cfs (215,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,810 cfs Apr. 4 (gage height, 7.23 ft); minimum daily, 26 cfs Sept. 12, 24.

1945-62: Maximum discharge, 4,180 cfs May 7, 1952 (gage height, 8.62 ft); minimum daily, 6.5 cfs Sept. 24, 1956.

Remarks.--Records good. Discharge measurements generally made three times a week. Canal diverts from Bear River at Stewart Dam in NE¼ sec.34, T.13 S., R.44 E., for storage in Bear Lake. At times flow in canal is augmented by surplus water from Black Otter 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	116	67	83	67	275	1,280	2,010	614	594	267	101
2	80	111	92	85	66	240	2,100	1,760	563	536	275	94
3	66	115	100	84	66	210	2,310	1,640	529	506	252	86
4	72	104	80	79	66	186	2,650	1,540	583	475	238	82
5	63	97	63	82	67	188	2,770	1,530	532	453	222	74
6	56	92	77	84	72	190	2,670	1,620	639	441	215	62
7	54	92	71	86	70	192	2,540	1,700	628	526	206	54
8	60	104	58	90	70	190	2,500	1,790	800	420	197	51
9	64	120	66	100	70	199	2,410	1,760	573	411	180	55
10	64	124	58	105	79	199	2,150	1,680	563	462	186	54
11	69	130	54	105	126	192	1,890	1,580	523	503	178	44
12	77	109	51	105	275	151	1,790	1,550	500	475	169	26
13	99	94	54	86	390	199	1,760	1,520	529	450	161	34
14	67	97	56	81	518	190	1,620	1,500	539	467	159	39
15	83	102	58	74	628	182	1,790	1,460	549	539	157	38
16	83	104	57	73	779	165	1,740	1,380	583	556	145	39
17	83	87	56	74	928	141	1,740	1,580	609	597	136	38
18	80	95	58	70	860	139	1,720	1,360	597	657	134	38
19	77	92	64	68	764	151	1,720	1,330	611	563	132	39
20	80	106	69	70	768	161	1,740	1,360	642	529	128	48
21	83	95	72	70	798	159	1,830	1,240	671	475	112	55
22	82	85	66	72	682	192	1,910	1,140	675	405	108	43
23	83	88	75	72	519	163	1,930	1,030	700	361	101	35
24	88	104	69	58	506	190	1,910	908	678	353	103	26
25	92	97	66	57	367	173	1,890	768	671	336	103	27
26	97	104	68	58	331	215	1,950	715	664	312	108	27
27	104	100	75	55	350	240	2,010	678	639	301	108	32
28	104	94	80	57	342	314	2,120	700	622	293	121	39
29	113	94	80	61	-----	526	2,190	722	632	301	105	38
30	115	87	80	62	-----	779	2,140	719	625	275	106	38
31	111	-----	87	67	-----	886	-----	680	-----	270	112	-----
Total	2,498	3,041	2,166	2,380	10,628	7,665	60,970	40,780	18,182	13,622	4,942	1,456
Mean	80.6	10.1	69.9	76.8	380	247	2,032	1,315	606	447	159	46.5
Ac-ft	4,950	6,030	4,300	4,720	21,080	15,200	120,900	80,890	36,060	27,490	9,800	2,890

Calendar year 1961: Max 252 Min 7.9 Mean 62.9 Ac-ft 45,560
 Water year 1961-62: Max 2,770 Min 26 Mean 462 Ac-ft 334,300

BEAR RIVER BASIN

10-0465. Bear River below Stewart Dam, near Montpelier, Idaho

Location.--Lat 42°15'30", long 111°17'30", in NE¼ sec.34, T.13 S., R.44 E., on right bank 300 ft downstream from Stewart Dam and 4½ miles south of Montpelier.

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

Records available.--January 1922 to September 1962. Monthly discharge only January 1922 to September 1943, published in RSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 5,950 ft (from topographic map).

Average discharge.--40 years, 61.0 cfs (44,160 acre-ft per year).

Extremes.--Maximum discharge during year, 48 cfs Apr. 2; (gage height, 1.73 ft); 0.4 cfs Oct. 23-27, May 25. 1922-62: Maximum daily discharge, 3,050 cfs June 3, 1923; no flow July 15, 1956.

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 above station for irrigation.

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

Rating table (gage height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used June 15 to Sept. 30)

0.7	0
.8	.9
.9	4.3
1.1	12
1.3	22

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	.9	.8	1.6	2.3	2.3	1.6	13	1.9	4.0	11	7.3	8.1
2	1.6	.7	1.6	2.3	2.3	1.6	22	1.9	4.0	8.9	7.7	7.7
3	1.2	.7	2.3	2.3	1.9	1.6	8.9	1.6	4.0	7.7	7.7	7.7
4	1.6	.9	1.9	2.3	1.9	1.9	16	1.6	4.3	7.3	7.3	7.3
5	1.6	.7	1.9	1.9	1.9	1.9	9.4	1.6	4.7	7.7	7.3	7.3
6	1.2	.7	2.6	2.3	1.9	1.9	6.2	1.2	4.7	8.5	7.7	7.3
7	1.2	.7	2.3	1.9	1.6	1.9	4.3	1.2	4.7	11	7.7	7.3
8	1.2	.6	2.3	2.3	1.2	1.6	3.3	.9	5.4	7.7	7.7	7.7
9	.9	.7	2.6	2.3	.8	1.6	2.6	1.2	5.8	7.3	7.7	7.7
10	.9	.7	2.3	2.3	.9	2.3	2.3	2.6	5.8	7.7	8.1	7.3
11	.9	.6	1.6	1.9	2.3	2.3	1.2	2.3	5.8	8.5	8.5	6.6
12	.7	.6	1.6	1.9	2.3	1.9	1.2	1.9	5.4	8.5	8.5	5.8
13	.5	.8	1.2	2.3	3.3	1.9	1.8	1.9	5.8	8.5	8.2	6.2
14	.6	1.2	1.6	1.9	5.1	1.9	1.2	1.9	6.6	8.9	8.9	6.2
15	.6	1.2	1.6	1.9	5.4	1.9	1.6	1.9	11	11	8.9	6.2
16	.5	1.6	1.9	1.9	5.4	1.9	1.2	2.3	12	11	8.5	6.2
17	.5	1.2	1.9	2.3	4.3	1.9	1.6	2.6	14	14	8.1	6.6
18	.6	1.2	1.9	2.3	3.6	1.9	1.6	2.6	13	17	8.1	6.6
19	.8	.9	1.9	2.6	2.3	2.3	1.6	2.9	13	13	8.1	6.6
20	.6	1.2	1.9	2.3	1.6	2.3	1.2	2.9	14	11	8.1	7.0
21	.5	1.6	1.9	2.3	1.9	2.3	1.6	2.6	16	10	7.7	7.3
22	.5	1.9	1.9	2.3	2.3	2.6	1.9	2.6	16	8.5	7.3	6.6
23	.4	1.9	1.9	2.3	1.9	2.3	1.8	2.3	17	8.5	7.3	6.2
24	.7	1.9	1.9	1.9	1.9	2.6	1.9	1.9	15	8.1	7.0	5.8
25	.4	1.6	1.9	1.9	1.9	2.6	1.9	2.3	14	8.1	7.0	5.8
26	.4	1.9	1.9	1.9	1.9	2.9	2.3	5.1	14	8.9	7.0	5.8
27	.4	1.6	1.9	1.9	1.9	2.6	2.3	4.7	13	8.9	7.7	5.4
28	.5	1.6	1.6	1.9	1.6	3.6	2.6	4.7	13	8.5	8.1	5.4
29	.5	1.6	1.6	2.3	-----	2.6	2.6	4.7	14	8.1	7.7	5.8
30	.6	1.6	1.9	2.3	-----	3.3	2.3	4.7	14	7.7	8.1	5.8
31	.6	-----	2.3	2.3	-----	5.1	-----	4.3	-----	7.7	8.5	-----
Total	23.7	34.8	59.2	66.6	71.1	70.6	123.3	78.8	294.0	289.2	244.2	199.3
Mean	0.76	1.16	1.91	2.15	2.54	2.28	4.11	2.54	9.80	9.33	7.88	6.64
Ac-ft	47	69	117	132	141	140	245	156	583	574	484	395
Calendar year 1961: Max	19	Min	0.4	Mean	4.19	Ac-ft	3,040					
Water year 1961-62: Max	22	Min	0.4	Mean	4.26	Ac-ft	3,080					

BEAR RIVER BASIN

10-0555. Bear Lake at Lifton, near St. Charles, Idaho

Location.--Lat 42°07'20", long 111°19'20", in NE¼ sec.16, T.15 S., R.44 E., in Lifton pumping plant of Utah Power & Light Co., 3½ miles east of St. Charles.

Drainage area.--435 sq mi, approximately (does not include Mud Lake drainage).

Records available.--October 1903 to June 1906 (gage heights only), January 1921 to September 1962. Monthly contents only January 1921 to September 1945 published in WSP 1314. Published as Bear Lake at Fish Haven 1903-6.

Gage.--Water-stage recorder. Datum of gage is 5,900 ft above mean sea level, unadjusted (levels by Utah Power & Light Co.). October 1903 to June 1906 staff gage at different site and datum.

Extremes.--Maximum contents during year, 868,200 acre-ft June 26, 27 (gage height, 15.70 ft); minimum, 475,700 acre-ft Oct. 3-17 (gage height, 9.74 ft).

1921-62: Maximum contents, 1,423,000 acre-ft June 10, 1923 (gage height, 23.68 ft); no usable contents Nov. 9-19, 1935 (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 Mud Lake. Inflow to lake augmented by water diverted from Bear River through Rainbow inlet canal and Dingle inlet canal, which empty into Mud Lake (see station 10-460). Water from Mud Lake reaches Bear Lake by a sluice at pumping plant or by gates in causeway at south end of Mud 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 Co., 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 Co.

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

9.0	428.4	13.0	687.5
10.0	492.3	14.0	754.0
11.0	556.7	15.0	821.0
12.0	621.8	16.0	888.6

Contents, in thousands of acre-feet, at 7 a.m., water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	476.3	476.3	478.2	479.5	485.3	526.2	549.6	712.0	841.8	855.5	813.6	748.6
2	476.3	476.3	478.2	478.5	485.9	528.9	552.2	717.3	844.4	854.8	811.6	746.0
3	475.7	476.3	478.2	479.5	485.9	527.5	556.0	722.6	846.5	863.4	809.6	743.3
4	475.7	476.9	478.2	479.5	485.9	528.1	560.6	728.0	848.5	861.4	808.3	740.6
5	475.7	476.9	478.2	479.5	485.9	528.8	565.8	732.6	849.8	859.4	806.3	737.9
6	475.7	476.9	478.2	479.5	485.9	529.4	572.3	737.9	850.5	856.6	804.2	735.9
7	475.7	476.9	478.2	479.5	486.5	530.7	578.8	742.6	851.2	855.9	802.2	733.9
8	475.7	476.9	478.2	479.5	487.2	531.4	586.0	747.3	851.9	851.2	800.2	732.8
9	475.7	476.9	478.2	479.5	487.2	532.0	592.4	752.0	853.2	847.8	798.2	729.9
10	475.7	476.9	478.2	480.1	487.2	532.6	599.6	757.4	853.9	844.4	797.6	728.0
11	475.7	476.9	478.2	480.1	486.5	533.3	606.1	762.0	854.6	841.1	796.2	727.3
12	475.7	476.9	478.2	480.1	489.7	534.0	612.6	766.7	855.3	837.8	794.9	726.6
13	475.7	476.9	478.9	480.1	491.0	534.6	617.8	772.1	856.0	836.4	793.5	725.3
14	475.7	476.9	478.9	480.1	492.9	535.2	623.1	777.4	857.3	833.7	791.5	724.0
15	475.7	477.6	478.9	480.1	494.2	535.9	628.3	782.8	858.0	832.4	789.5	722.6
16	475.7	477.6	478.9	480.1	496.8	536.6	632.9	787.5	859.4	832.4	787.5	721.3
17	475.7	477.6	478.9	480.8	500.0	537.2	637.5	792.2	860.7	832.4	786.2	719.9
18	476.3	477.6	478.9	480.8	503.2	537.8	645.4	796.2	862.1	831.7	784.2	719.9
19	476.3	477.6	478.9	480.8	505.7	538.5	646.7	800.2	863.4	831.7	782.1	719.9
20	476.3	477.6	478.9	481.4	507.7	539.2	651.2	804.2	864.1	831.0	780.1	719.3
21	476.3	477.6	478.9	482.1	510.2	540.4	657.1	807.6	864.8	829.7	778.1	719.3
22	476.3	477.6	478.9	482.1	512.8	541.1	662.4	811.0	865.5	830.4	776.1	718.6
23	476.3	477.6	478.9	482.7	515.3	542.4	667.7	813.6	866.2	827.7	774.1	718.0
24	476.3	477.6	478.9	482.7	517.9	543.0	673.6	817.0	866.9	826.4	771.4	718.0
25	476.3	477.6	478.9	483.3	520.5	543.7	679.6	819.0	867.5	825.0	768.7	717.3
26	476.3	477.6	478.9	483.3	523.0	544.4	684.9	821.0	868.2	823.7	766.1	717.3
27	476.3	477.6	478.9	483.3	524.3	545.0	689.5	823.7	868.2	822.3	763.4	716.6
28	476.3	477.6	478.9	484.0	525.6	545.6	696.1	834.4	867.5	821.0	760.7	716.6
29	476.3	477.6	479.5	484.0	-----	546.3	701.4	835.1	866.8	819.0	758.0	716.6
30	476.3	478.2	479.5	485.3	-----	547.0	706.0	837.1	866.2	817.0	754.7	716.6
31	476.3	-----	479.5	485.3	-----	547.6	-----	839.1	-----	815.6	751.3	-----
†	5,909.75	5,909.78	5,909.80	5,909.89	5,910.52	5,910.86	5,913.28	5,915.27	5,915.67	5,914.92	5,913.96	5,913.44
‡	0	+1.9	+1.3	+5.8	+40.3	+22.0	+158.4	+133.1	+27.1	-50.6	-64.3	-34.7

Calendar year 1961.....† -294.6

Water year 1961-62.....‡ +240.3

† Elevation, in feet, at end of month.

‡ Change in contents, in thousands of acre-feet.

BEAR RIVER BASIN

10-0586. Bloomington Creek at Bloomington, Idaho

Location.--Lat 42°11'05", long 111°25'30", in SE¹SE¹ sec.20, T.14 S., R.43 E., on left bank 1 mile west of Bloomington.

Drainage area.--24.4 sq mi.

Records available.--October 1960 to September 1962.

Gage.--Water-stage recorder 4 feet above 8-foot concrete flume. Altitude of gage is 6,070 ft (from topographic map).

Extremes.--Maximum discharge during year, 156 cfs May 8 (gage height, 3.99 ft); minimum, 9.4 cfs Feb. 26, 1960-62; Maximum discharge, that of May 8, 1962; minimum, 9.4 cfs Jan. 27, 1961, Feb. 26, 1962.

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

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

1.4	12
2.0	36
2.5	62
3.0	91
3.7	136

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	13	13	12	12	12	17	56	73	45	30	24
2	13	13	13	12	12	12	15	55	73	45	30	24
3	13	13	13	12	12	12	20	65	76	43	29	23
4	13	13	13	12	12	12	22	87	74	43	29	23
5	13	13	13	12	12	12	20	105	68	42	29	23
6	13	13	13	12	12	12	22	118	67	41	28	23
7	13	13	13	12	12	12	28	123	*62	40	28	23
8	13	13	13	12	12	12	24	128	60	40	28	23
9	13	13	13	12	13	12	22	132	59	39	27	23
10	13	13	13	12	17	12	21	130	61	38	*30	23
11	13	13	13	12	22	12	23	*127	63	38	27	22
12	13	13	13	12	26	12	27	123	65	37	28	22
13	*13	*13	13	12	23	13	33	110	68	*40	27	22
14	13	13	12	12	17	13	39	101	66	40	28	*22
15	13	13	12	12	16	12	44	89	66	37	26	22
16	13	13	12	12	*15	12	*48	81	64	36	26	22
17	13	13	12	12	14	12	50	78	61	36	26	22
18	13	13	12	12	13	12	*50	75	59	35	26	22
19	13	13	12	12	13	12	56	82	58	34	25	22
20	13	13	12	12	13	12	55	84	59	33	26	22
21	13	13	12	12	13	12	53	80	59	32	28	22
22	13	13	12	12	13	12	52	71	57	32	27	22
23	13	13	12	12	13	12	55	68	56	33	28	22
24	13	13	12	12	13	12	62	71	55	33	28	21
25	13	13	12	12	13	12	66	70	50	32	26	21
26	13	13	12	12	12	13	77	68	50	32	26	21
27	14	13	12	12	12	14	74	70	50	32	26	21
28	13	13	12	12	12	14	115	67	49	31	25	21
29	13	13	12	12	-----	14	80	67	48	31	25	22
30	13	13	12	12	-----	14	62	69	47	31	24	21
31	13	-----	12	12	-----	14	-----	73	-----	30	24	-----
Total	404	390	385	372	399	385	1,336	2,724	1,821	1,151	834	666
Mean	13.0	13	12.4	12	12.4	12.4	44.5	87.9	60.7	36.5	26.9	22.2
Ac-ft	801	774	764	738	791	764	2,650	5,400	3,610	2,240	1,650	1,320

Calendar year 1961: Max 36 Min 12 Mean 15.6 Ac-ft 11,260
 Water year 1961-62: Max 132 Min 12 Mean 29.7 Ac-ft 21,500

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 15 to Jan. 15, Jan. 22 to Feb. 11, July 26 to Aug. 10.

BEAR RIVER BASIN

10-0595. Bear Lake outlet canal near Paris, Idaho

Location.--Lat 42°13'00", long 111°20'30", in SW $\frac{1}{4}$ 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 1962. Monthly discharge only January 1922 to September 1945, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 5,920 ft (from topographic map).

Average discharge.--40 years, 337 cfs (244,000 acre-ft per year).

Extremes.--Maximum daily discharge during year, 1,460 cfs July 7; minimum daily, 1.1 cfs Oct. 17-19.
1922-62: Maximum daily discharge, 1,870 cfs Aug. 8, 1924; minimum daily, 1 cfs for many days in 1937, 1954, 1959, 1961.

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

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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	74	1.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,130	663	777
2	51	1.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,120	666	736
3	1.9	1.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,140	672	721
4	1.8	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,220	666	727
5	1.9	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,500	652	692
6	1.7	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,430	652	646
7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,480	649	550
8	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,470	679	504
9	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,440	649	504
10	1.5	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,430	660	374
11	1.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,460	660	172
12	1.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,430	660	184
13	1.3	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,250	695	196
14	1.3	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	822	736	210
15	1.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	771	738	136
16	1.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	765	744	37
17	1.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	724	735	35
18	1.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	272	724	744	34
19	1.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	564	715	744	32
20	1.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	368	786	804	31
21	1.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	411	883	852	28
22	1.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	413	883	856	29
23	1.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	434	877	831	28
24	1.3	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	431	877	852	26
25	1.3	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	524	877	840	26
26	1.3	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	897	890	837	25
27	1.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,120	877	834	28
28	1.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,120	893	843	28
29	1.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,120	896	826	33
30	1.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1,130	890	798	30
31	1.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	776	801	801	30
Total	165.5	52.1	55.8	55.8	50.4	55.8	54.0	55.8	8,834.6	32,226	23,008	7,579	
Mean	5.34	1.74	1.60	1.8	1.6	1.8	1.8	1.8	294	1,040	742	253	
Ac-ft	328	103	111	111	100	111	107	111	17,520	63,920	45,640	15,030	

Calendar year 1961: Max 1,520 Min 1.1 Mean 363 Ac-ft 263,000
 Water year 1961-62: Max 1,480 Min 1.1 Mean 198 Ac-ft 143,200

Note.--No gage-height record Oct. 3 to June 17.

BEAR RIVER BASIN

10-0875. Mink Creek below Dry Fork, near Mink Creek, Idaho

Location.--Lat 42°15'30", long 111°40'30", in NE¼NW¼ sec.33, T.13 S., R.41 E., on right bank 500 ft downstream from Dry Fork and 3 miles northeast of town of Mink Creek.

Drainage area.--19.3 sq mi.

Records available.--April 1947 to September 1952, October 1955 to September 1962 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 5,300 ft (from topographic map).

Average discharge.--12 years 72.8 cfs (52,710 acre-ft per year).

Extremes.--Maximum discharge during year, 421 cfs May 10 (gage height, 3.54 ft); minimum, 9.0 cfs Oct. 5, 1947-52, 1955-62; Maximum discharge, 600 cfs May 29, 1948; maximum gage height, 3.97 ft June 7, 1957; minimum discharge, 2.5 cfs Oct. 4, 1960.

Remarks.--Records good except those for period of doubtful or no gage-height record, which are fair. Mink Creek Canal began diverting above station in June 1950. Diversion is routed through Glendale Reservoir in Worm Creek basin for irrigation near Preston. Two other diversions above station for irrigation of about 1,000 acres above and below station.

Rating table (gage height, in feet, and discharge in cubic feet
per second
(Shifting-control method used July 14 to Sept. 30)

1.3	9.0	2.4	101
1.4	12	2.9	200
1.5	16	3.2	288
1.7	27	3.6	435
2.0	52		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	30	28	27	25	37	56	222	280	100	36	17
2	9.3	*30	28	26	*25	*36	*63	195	285	96	35	18
3	9.3	30	28	26	26	36	68	198	310	92	34	20
4	9.3	29	*28	26	27	35	72	233	310	87	34	20
5	9.3	28	28	*26	28	34	76	298	295	86	35	18
6	11	28	28	26	28	34	73	334	263	80	34	19
7	12	28	28	27	29	34	76	364	242	76	32	20
8	15	28	28	28	28	34	76	380	222	72	30	20
9	28	29	28	28	28	34	72	*410	208	68	28	20
10	29	30	27	28	46	34	69	418	205	*65	29	20
11	27	30	27	28	101	33	66	414	208	62	30	18
12	26	30	26	28	126	33	68	414	227	60	29	18
13	27	30	26	28	103	32	77	396	227	61	28	18
14	28	30	26	28	85	32	90	380	227	58	26	17
15	28	29	26	28	74	31	107	349	222	55	23	16
16	28	29	26	29	68	31	122	306	190	54	23	16
17	28	29	26	28	60	30	126	285	180	52	23	16
18	28	28	26	28	55	31	141	263	180	50	22	16
19	28	28	27	28	52	33	162	260	180	50	21	16
20	28	28	27	28	49	35	*208	279	175	47	*21	15
21	28	28	27	25	47	36	195	282	170	45	20	18
22	28	28	27	25	45	37	175	276	160	43	20	18
23	28	28	27	25	44	37	169	280	155	43	19	16
24	28	28	27	25	43	36	203	251	145	42	19	16
25	28	28	27	25	42	38	245	263	139	41	18	16
26	29	28	27	25	40	39	269	263	133	43	18	15
27	30	28	27	25	39	47	276	257	126	43	18	14
28	31	28	27	25	38	52	288	233	119	46	16	14
29	30	28	27	25	-----	50	292	219	112	43	19	15
30	29	28	27	25	-----	49	257	219	105	41	18	16
31	29	-----	27	25	-----	51	-----	*236	-----	38	18	-----
Total	736.2	861	839	823	1,401	1,141	4,237	9,157	5,980	1,839	778	518
Mean	23.7	28.7	27.1	26.5	50.0	36.8	141	295	139	59.3	25.1	17.2
Ac-ft	1,460	1,710	1,660	1,630	2,780	2,260	6,400	18,160	11,860	3,650	1,540	1,020

Calendar year 1961: Max 180 Min 7.2 Mean 34.9 Ac-ft 25,260
 Water year 1961-62: Max 418 Min 9.3 Mean 77.6 Ac-ft 56,130

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record Jan. 12 to Feb. 1, June 2-4, 17-24, June 29 to July 10.

BEAR RIVER BASIN

10-0905. Bear River near Preston, Idaho

Location.--Lat 42°10', long 111°51', in NW¼ sec.36, T.14 S., R.39 E., on left bank 600 ft downstream from headgates of West Cache Canal, 5 miles downstream from Mink Creek, 5 miles north of Preston, and 5½ miles upstream from Battle Creek.

Drainage area.--4,500 sq mi, approximately.

Records available.--October 1889 to December 1916, January to September 1917 (gage heights only), January 1944 to September 1962. Prior to 1903, published as "at Battlecreek." Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 4,540 ft (from topographic map). October 1889 to September 1917 staff or wire-weight gages at several sites within 5 miles downstream at different datums.

Average discharge.--19 years (1943-62), 795 cfs (575,600 acre-ft per year).

Extremes.--Maximum discharge during year, 4,240 cfs Feb. 12 (gage height, 5.51 ft. from highwater mark in well); minimum, 13 cfs Mar. 27 (gage height, 0.49 ft); minimum daily, 99 cfs Sept. 18.
1889-1917: Maximum discharge, about 8,500 cfs June 9, 10, 1907, estimated on basis of records for station near Collinston, Utah; maximum gage height observed, 9.04 ft Jan. 17, 18, 1917 (backwater from ice), site and datum then in use; minimum discharge not determined.
1943-62: Maximum discharge, 4,420 cfs Apr. 17, 1950 (gage height, 5.61 ft); minimum, 0.6 cfs June 14, 1949; minimum daily, 9.5 cfs July 6, 1957.

Remarks.--Records excellent. Station is below all irrigation diversions from Bear River in Idaho except Cub River pumps in SE¼ sec.20, T.16 S., R.39 E., Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation, and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	357	273	466	298	489	610	710	1,590	459	633	712	556
2	292	263	371	303	433	960	625	1,320	513	632	479	309
3	197	433	150	337	467	790	1,100	1,300	325	671	437	705
4	363	210	379	364	171	402	1,050	1,340	444	742	414	574
5	368	166	484	*361	721	483	1,120	1,320	555	858	332	728
6	285	280	422	357	569	536	1,490	1,200	473	1,070	398	542
7	267	260	488	281	*444	445	1,430	1,050	418	1,360	319	478
8	285	236	472	495	400	604	1,690	1,300	350	1,150	404	465
9	454	304	299	531	541	497	1,670	1,040	408	1,390	457	287
10	128	*462	182	365	1,540	633	1,510	1,470	487	1,120	427	248
11	260	108	419	423	3,790	534	1,720	1,220	481	963	537	149
12	202	154	213	381	3,940	527	1,470	1,220	386	946	500	187
13	409	371	221	387	*3,260	562	1,660	861	287	924	540	143
14	282	316	266	242	2,020	657	1,670	1,070	198	902	422	166
15	239	394	290	364	1,800	573	1,480	1,070	157	618	536	159
16	248	382	281	347	1,490	402	1,620	992	123	747	451	99
17	245	461	187	397	1,230	545	1,480	920	172	691	660	231
18	317	232	233	433	1,110	202	1,720	852	133	510	420	143
19	336	180	245	408	330	349	1,280	367	137	490	552	151
20	246	213	571	509	813	560	1,650	168	222	546	550	192
21	351	436	708	120	933	809	1,520	521	306	653	553	141
22	152	524	601	474	765	788	1,400	393	400	824	768	139
23	397	135	170	397	583	583	1,580	278	391	521	603	209
24	188	364	122	370	728	597	1,630	248	319	466	705	181
25	281	370	183	388	348	293	1,820	347	450	471	745	158
26	267	266	471	425	689	658	1,720	255	602	472	734	138
27	351	412	493	330	885	791	1,610	194	896	457	637	196
28	372	363	371	322	1,040	374	1,830	362	658	763	613	171
29	227	474	415	336	-----	721	1,530	424	575	465	738	246
30	245	425	366	339	-----	662	1,440	482	620	515	688	202
31	308	-----	194	451	-----	826	-----	*419	-----	465	693	-----
Total	8,889	9,418	10,691	11,640	31,835	17,993	44,245	25,571	11,957	22,532	17,044	8,313
Mean	287	314	345	375	1,137	580	1,475	825	399	727	550	277
Ac-ft	17,630	18,680	21,210	23,090	63,340	35,690	87,760	50,720	23,720	44,690	33,810	16,490

Calendar year 1961: Max 1,200 Min 39 Mean 504 Ac-ft 364,600
 Water year 1961-62: Max 3,940 Min 99 Mean 803 Ac-ft 436,600

* Discharge measurement made on this day.

BEAR RIVER BASIN

10-0930. Cub River near Preston, Idaho

Location.--Lat 42°06', long 111°41', in SW¼ sec. 5, T.15 S., R.41 E., on right bank 0.2 mile upstream from headgates of Cub River-Worm 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 1962.

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

Average discharge.--19 years, 83.0 cfs (60,090 acre-ft per year).

Extremes.--Maximum discharge during year, 555 cfs May 9, 10 (gage height, 2.85 ft); minimum, 13 cfs Jan. 20, result of freezeup.

1940-52, 1955-62; Maximum discharge, 715 cfs June 7, 1957 (gage height, 3.39 ft; maximum gage height, 3.85 ft June 2, 1943; minimum discharge, 11 cfs Jan. 22, 1951.

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

Rating table (gage height, in feet, and discharge, in cubic feet
per second)
(Shifting-control method used May 17 to June 30, July 26 to Sept. 30)

0.5	16	1.9	178
.6	28	2.5	368
1.0	41	2.9	548
1.3	71		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	20	20	18	17	26	48	235	316	134	52	37
2	21	*20	20	18	*17	*26	*56	200	335	128	51	37
3	21	20	20	18	17	26	56	197	360	121	49	37
4	21	20	*20	18	18	25	63	258	352	114	48	38
5	21	20	20	*18	18	24	67	385	316	110	48	37
6	21	20	19	18	19	24	63	473	277	105	48	37
7	21	20	20	18	19	24	69	523	252	101	47	37
8	21	20	19	18	19	24	66	514	232	95	47	36
9	22	20	19	18	20	24	59	*546	224	93	47	36
10	22	20	19	18	34	24	54	541	241	*88	47	35
11	21	20	18	18	77	24	52	526	264	95	46	35
12	20	20	18	18	108	24	58	523	284	82	45	35
13	20	20	18	18	72	24	70	478	297	84	44	34
14	20	20	18	18	60	24	87	429	294	79	43	34
15	20	20	18	18	50	23	106	372	280	75	43	33
16	20	20	18	18	47	23	117	316	258	74	43	33
17	20	20	18	18	41	23	136	294	235	71	42	33
18	20	20	18	18	38	23	172	266	221	69	41	32
19	20	20	18	18	35	23	210	280	218	67	41	32
20	20	20	18	18	33	25	*261	320	218	66	*40	33
21	20	20	18	18	32	26	249	306	218	64	40	32
22	20	20	18	18	31	28	202	271	210	63	40	32
23	20	19	18	18	30	29	190	252	202	61	40	32
24	20	19	18	18	29	28	235	249	197	60	39	32
25	20	19	18	18	28	30	284	241	188	59	38	31
26	20	20	18	18	28	33	327	241	178	61	38	31
27	21	19	18	17	28	37	331	249	170	59	36	31
28	21	19	18	17	27	43	352	241	169	57	37	31
29	20	19	18	17	-----	42	343	235	151	55	37	32
30	20	19	18	17	-----	40	280	258	142	54	37	31
31	20	-----	18	17	-----	43	-----	*271	-----	53	37	-----
Total	835	593	574	553	991	862	4,665	10,476	7,287	2,487	1,333	1,016
Mean	20.5	19.8	18.5	17.8	35.4	27.8	156	336	243	80.2	43.0	33.9
Ac-ft	1,260	1,180	1,140	1,100	1,970	1,710	9,250	20,780	14,450	4,950	2,640	2,020

Calendar year 1961: Max 327 Min 16 Mean 48.3 Ac-ft 34,950
 Water year 1961-62: Max 546 Min 17 Mean 86.2 Ac-ft 62,430

* Discharge measurement made on this day.
 Note.--Stage-discharge relation affected by ice Dec. 10-12, Jan. 8-13, 20-25. No gage-height record Mar. 8 to Apr. 1.

BEAR RIVER BASIN

10-1057. South Fork Little Bear River near Avon, Utah

Location.--Lat 41°30'45", long 111°48'40" in SW¼SW¼ sec.14, T.9 N., R.1 E., on right bank 0.6 mile downstream from Davenport Creek and 1½ miles south of Avon.

Drainage area.--62.1 sq mi.

Records available.--October 1960 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 5,020 ft (from topographic map).

Extremes.--Maximum discharge during year, 900 cfs Feb. 10 (gage height, 3.62 ft); minimum, 8.0 cfs Nov. 18.
1960-62: Maximum discharge, that of Feb. 10, 1962; minimum, 8.0 cfs Feb. 27, Nov. 18, 1961.

Remarks.--Records good. A few small diversions for irrigation above the station.

Cooperation.--Three discharge measurements furnished by Little Bear River water commissioner.

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

Oct. 1 to Feb. 10				Feb. 10 to Sept. 30			
0.7	8.9	1.0	24	0.5	17	1.5	149
.8	13	1.2	42	.8	37	2.0	277
.9	18			1.1	70	2.5	435

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	16	17	13	*15	31	124	142	156	50	31	23
2	13	16	22	14	15	28	131	151	154	43	31	24
3	13	16	39	14	15	27	142	135	156	48	28	24
4	13	16	22	16	16	27	173	163	156	44	27	24
5	13	15	19	15	16	27	154	217	135	42	28	24
6	12	14	19	15	16	28	133	252	133	40	28	24
7	13	15	14	16	16	31	151	263	126	38	28	24
8	14	16	17	24	17	30	117	244	113	40	28	24
9	13	16	14	15	22	31	106	236	106	38	28	25
10	13	16	14	11	422	30	102	214	111	37	30	25
11	13	16	12	14	402	28	113	200	113	37	29	25
12	13	15	14	16	*415	28	133	192	113	37	28	25
13	13	14	16	16	142	24	*156	180	109	41	28	24
14	14	15	16	16	91	23	175	163	102	40	28	22
15	14	16	16	16	100	24	197	149	98	37	28	*22
16	14	16	16	16	91	25	195	133	*94	37	27	24
17	14	15	16	16	66	26	*197	131	87	36	26	24
18	14	13	16	16	55	27	192	119	79	34	26	24
19	14	16	16	16	48	30	204	115	76	34	26	23
20	14	16	21	16	44	34	222	117	74	33	26	23
21	14	16	20	16	41	34	222	138	72	31	26	22
22	16	16	17	15	38	35	202	135	69	33	26	22
23	15	17	15	16	36	37	159	*122	66	33	26	22
24	15	17	16	16	33	33	156	122	64	33	26	22
25	15	16	16	15	30	35	173	126	62	33	26	22
26	15	20	16	15	31	52	267	124	61	33	25	21
27	18	19	13	15	23	96	197	126	*58	32	25	22
28	19	18	17	15	*26	100	241	131	55	31	25	22
29	17	17	*18	15	-----	80	190	131	55	30	25	20
30	17	*17	16	15	-----	*76	*163	*135	53	30	25	22
31	*16	-----	14	15	-----	89	-----	156	-----	*31	*24	-----
Total	442	481	532	479	2,282	1,226	5,077	4,944	2,905	1,140	838	694
Mean	14.3	16.0	17.2	15.5	81.5	39.5	189	159	96.8	36.8	27.0	23.1
Ac-ft	877	954	1,060	950	4,530	2,430	10,070	9,810	5,760	2,280	1,660	1,380

Calendar year 1961: Max 104 Min 11 Mean 23.4 Ac-ft 16,900
Water year 1961-62: Max 422 Min 11 Mean 57.8 Ac-ft 41,740

* Discharge measurement made on this day.

BEAR RIVER BASIN

10-1060. Little Bear River near Paradise, Utah

Location.--Lat 41°35'25", long 111°51'10", in SE $\frac{1}{4}$ sec.20, T.10 N., R.1 E., on right bank 1 mile upstream from backwater of Hyrum Reservoir, 2 miles northwest of Paradise, and 5 miles downstream from East Fork.

Drainage area.--203 sq mi.

Records available.--January 1937 to September 1962. Monthly discharge only for some periods, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 4,680 ft (from topographic map). Prior to Nov. 28, 1945, at site 150 ft upstream at different datum. Nov. 28, 1945 to May 19, 1952 at present site at datum 1.50 ft higher.

Average discharge.--25 years, 84.3 cfs (61,030 acre-ft per year).

Extremes.--Maximum discharge during year, 2,000 cfs Feb. 11 (gage height, 6.52 ft), from rating curve extended above 600 cfs by logarithmic plotting; minimum, 13 cfs, Oct. 1, 1937-62; Maximum discharge, that of Feb. 11, 1962; minimum, 4 cfs Aug. 14, 1940.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions above station for irrigation of about 400 acres above and 2,400 acres below station. Slight regulation by trout farm about 2 miles upstream. April and May runoff affected by water temporarily impounded behind partially completed Porcupine Dam on East Fork. No diversion between station and Hyrum Reservoir.

Cooperation.--Three discharge measurements furnished by Little Bear River water commissioner.

Rating table, except periods of ice effect (gage height, in feet
and discharge, in cubic feet per second)
(Shifting-control method used Feb. 12-18, Apr. 11-18, June 12 to Aug. 20)

3.0	10	4.0	206
3.1	15	4.5	450
3.3	29	5.0	770
3.5	60	5.7	1,310
3.8	140		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	*41	42	32	b36	77	253	466	221	25	20	17
2	14	41	46	b34	b35	70	278	438	214	26	20	15
3	14	41	42	b35	b34	70	305	420	214	27	22	19
4	14	41	36	37	34	65	360	444	253	28	22	19
5	14	39	49	36	33	62	340	510	202	28	22	19
6	14	38	47	36	34	67	290	570	202	27	22	20
7	14	38	39	37	37	79	315	594	217	28	21	19
8	14	37	46	b37	38	72	258	576	182	27	21	20
9	15	39	36	b37	46	74	229	504	165	28	22	20
10	15	39	b36	b37	820	77	229	468	159	29	23	21
11	14	39	b36	b38	1,260	67	258	426	146	29	23	21
12	14	38	b37	b38	933	65	300	402	131	29	23	20
13	15	38	38	38	365	60	*350	365	120	32	24	20
14	15	36	38	b36	262	60	365	325	108	30	24	21
15	15	38	36	34	240	60	450	285	92	29	24	*20
16	16	38	38	b34	244	60	468	240	*87	28	24	20
17	16	38	38	b34	*165	60	*474	206	82	26	24	19
18	16	34	36	34	134	65	432	178	74	24	*25	19
19	22	38	39	34	114	74	426	140	65	24	25	19
20	23	41	55	b34	108	89	540	140	55	25	24	18
21	23	39	53		100	100	588	210	42	26	23	18
22	26	38	46		95	98	558	214	46	27	24	18
23	26	39	41	b33	95	114	498	*182	46	26	23	18
24	27	38	42		b85	98	468	178	41	26	20	20
25	29	39	42		b81	105	480	171	39	25	20	20
26	30	47	41		b81	140	594	182	32	25	20	20
27	34	46	41		b79	236	498	192	28	23	20	20
28	44	44	42	b35	*b79	272	594	196	27	23	19	20
29	41	39	*38			202	528	214	*27	22	19	20
30	41	*42	37			*192	*498	214	27	21	19	20
31	41	-----	34			206	-----	*240	-----	*20	*17	-----
Total	669	1,103	1,341	1,087	5,725	3,134	12,222	9,892	3,344	813	678	583
Mean	21.6	39.4	43.3	35.1	204	101	407	319	111	26.2	21.9	19.4
Ac-ft	1,330	2,350	2,660	2,180	11,360	6,220	24,240	19,620	6,630	1,610	1,350	1,160
Calendar year 1961: Max	182			7.3	Mean	35.8	Ac-ft	25,900				
Water year 1961-62: Max	1,260			15	Mean	111	Ac-ft	80,650				

Peak discharge (base, 400 cfs).--Feb. 11 (0300) 2,000 cfs (6.52 ft); Apr. 26 (0900) 810 cfs (5.07 ft).

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

BEAR RIVER BASIN

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

Location.--Lat 41°44'40", long 111°47'00", in NE¼ sec.36, T.12 N., R.1 E., on right bank at Logan plant of Utah Power & Light Co., 125 ft upstream from tailrace, half a mile upstream from State dam, and 2½ miles east of Logan.

Drainage area.--218 sq mi.

Records available.--June 1896 to September 1962. Published as Logan River near Logan prior to 1913. Records since May 1913 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 4,860 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 datums and Oct. 1, 1913, to Sept. 3, 1938, at datum about 2.3 ft lower than present datum.

Average discharge.--49 years (1913-62), 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, 65 years (1896-1962), 277 cfs (199,100 acre-ft per year).

Extremes.--Maximum discharge during year, 900 cfs May 9 (gage height 3.93 ft); minimum daily, 12 cfs for several days.

Maximum combined discharge during year (Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal) 1,240 cfs May 9; minimum daily, 60 cfs Dec. 11.

1913-62: Maximum discharge, 2,000 cfs Mar. 21, 1918 (gage height, 5.6 ft, datum then in use), from rating curve extended above 1,000 cfs; minimum daily 6 cfs Nov. 7, 1940.

1896-1962: 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 24, 1907; minimum daily, 50 cfs Jan. 21, 1935.

Remarks.--Records good. 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 flume that siphons canyon 400 ft upstream from station.

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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	14	13	14	14	17	26	428	419	139	*17	28
2	14	13	14	15	15	13	67	369	437	128	18	31
3	14	13	14	14	15	13	87	348	474	121	17	31
4	14	13	14	13	15	12	*98	396	777	114	17	*33
5	13	13	14	13	15	22	65	474	414	85	17	36
6	14	13	13	14	15	13	48	571	378	65	17	42
7	14	13	*13	14	15	*14	65	*870	340	64	17	38
8	14	14	13	15	*15	14	55	780	304	58	17	39
9	14	14	13	14	15	14	40	838	304	57	17	39
10	14	14	13	13	17	14	42	802	323	53	19	39
11	13	*13	15	13	44	16	60	729	340	*48	18	36
12	12	13	18	13	78	15	105	658	378	48	17	*35
13	12	13	14	14	53	15	150	627	391	58	17	35
14	13	13	15	14	41	*13	205	*851	391	84	17	34
15	13	13	16	13	28	14	285	484	378	50	17	33
16	12	12	*17	13	34	14	319	418	352	40	*18	31
17	12	12	18	13	20	13	369	352	296	38	18	42
18	*12	12	18	13	16	22	*423	308	255	31	18	29
19	12	12	17	14	14	18	418	282	285	28	18	31
20	12	13	17	14	15	20	505	282	271	26	18	27
21	13	13	16	14	13	21	418	296	282	25	19	27
22	13	13	15	14	12	21	295	311	262	22	25	35
23	13	13	14	14	13	21	300	304	239	20	21	26
24	13	13	14	14	13	20	391	304	223	26	22	27
25	13	13	15	14	13	19	451	304	202	20	21	27
26	15	13	15	14	13	21	512	308	194	19	18	27
27	14	15	14	14	14	57	*488	311	*177	18	18	28
28	15	13	13	14	14	89	702	311	166	18	15	29
29	14	13	12	14	-----	62	638	*311	158	18	15	43
30	14	13	13	14	-----	27	507	308	142	17	*60	46
31	15	-----	13	14	-----	21	-----	589	-----	17	28	-----
Total	413	390	450	427	600	674	8,110	13,838	9,234	1,520	605	1,000
Mean	13.3	13.0	14.5	13.8	21.4	21.7	270	446	308	49.0	19.5	33.3
Ac-ft	819	774	893	847	1,190	1,360	16,080	27,450	18,320	3,010	1,200	1,980

Calendar year 1961: Max 126 Min 11 Mean 21.4 Ac-ft 15,520

Water year 1961-62: Max 838 Min 12 Mean 102 Ac-ft 73,910

* Discharge measurement made on this day.
 Note.--No gage-height record Jan. 22-31.

BEAR RIVER BASIN

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

Combined discharge, in cubic feet per second, of Logan River above State dam, Utah Power & Light Co.'s tailrace, and Logan, Hyde Park & Smithfield Canal near Logan, Utah, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	91	81	87	72	89	124	823	626	398	221	179
2	86	91	82	74	74	91	127	858	855	388	222	193
3	84	86	88	76	73	86	145	840	693	375	277	183
4	86	87	86	77	75	88	182	898	882	366	216	180
5	85	84	81	74	78	88	200	896	690	547	214	176
6	89	79	80	77	78	92	202	800	593	339	214	182
7	90	81	75	79	81	94	218	804	554	335	211	178
8	91	85	78	85	84	91	209	1,020	517	328	205	179
9	92	89	76	78	81	91	185	1,090	516	322	203	179
10	94	85	87	82	91	89	198	1,070	541	317	212	179
11	90	86	80	82	128	90	219	991	572	305	211	176
12	87	83	85	75	168	78	267	958	605	300	204	174
13	85	78	78	84	156	80	319	888	628	317	197	174
14	84	80	78	77	146	79	369	811	631	325	197	173
15	84	83	79	78	132	76	431	738	617	304	195	170
16	85	80	80	76	136	84	488	666	589	291	191	168
17	83	80	81	76	121	85	545	609	533	283	189	159
18	84	76	80	80	116	89	602	684	500	274	190	168
19	82	78	81	78	103	89	633	636	503	265	189	170
20	85	83	86	79	111	93	705	534	519	264	186	162
21	83	82	84	72	107	96	619	519	532	255	185	162
22	87	78	80	70	104	95	491	519	520	258	182	162
23	88	82	73	64	104	102	496	512	503	254	182	161
24	87	82	75	67	98	97	591	515	490	248	183	163
25	82	80	80	74	92	93	650	515	472	243	181	163
26	88	83	82	82	98	100	713	516	480	239	176	162
27	88	84	74	81	87	87	888	496	442	234	172	162
28	86	78	76	73	76	95	899	501	430	236	166	164
29	92	77	77	69	-----	106	837	512	419	234	167	169
30	86	81	77	70	-----	122	703	510	407	227	161	162
31	85	-----	74	72	-----	118	-----	571	-----	223	174	-----
Total	2,698	2,472	2,410	2,310	2,675	2,851	13,061	20,870	16,398	9,085	6,011	5,122
Mean	87.0	82.4	77.7	74.5	103	92.0	455	673	546	293	194	171
Ac-ft	5,350	4,900	4,780	4,580	5,700	5,650	28,910	41,400	32,520	18,020	11,920	10,160
Calendar year 1961: Max		390	Min	60	Mean	125	Ac-ft	90,760				
Water year 1961-62: Max		1,080	Min	60	Mean	236	Ac-ft	170,800				

BEAR RIVER BASIN

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

Location.--Lat 41°37'20", long 111°44'25", in NE¼ sec. 8, T.10 N., R.2 E., on right bank three-quarters of a mile upstream from diversion dam, 3¼ miles upstream from powerplant of Utah Power & Light Co., and 6 miles east of Hyrum.

Drainage area.--260 sq mi.

Records available.--October 1913 to September 1962. Monthly discharge only for October 1913, published in WSP 1314.

Gage.--Water-stage recorder. Altitude of gage is 5,000 ft (from topographic map). Prior to Oct. 2, 1934, at site 1,000 ft upstream at different datum.

Average discharge.--49 years, 124 cfs (89,770 acre-ft per year).

Extremes.--Maximum discharge during year, 830 cfs Apr. 20 (gage height, 4.94 ft); minimum daily, 36 cfs Feb. 7, 8.

1913-62: Maximum discharge, 1,620 cfs May 15, 1917 (gage height, 6.5 ft, from floodmarks, site and datum then in use), from rating curve extended above 800 cfs; minimum daily, 29 cfs Jan. 3, 1935.

Remarks.--Records good except those for periods of ice effect or 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, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 1-13, Apr. 30, May 1)

1.9	22	2.5	145
2.0	40	3.0	271
2.1	58	4.0	548
2.2	79	4.4	641

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	*54	49	b47	*47	54	134	355	171	111	100	92
2	49	56	51	b47	47	53	170	326	169	111	98	92
3	49	54	54	b51	47	49	136	326	169	111	96	92
4	47	54	53	51	45	49	*157	345	171	111	96	90
5	47	54	51	49	42	49	164	377	164	109	96	92
6	47	54	51	49	38	47	157	377	167	109	98	90
7	51	53	49	51	36	49	181	382	167	107	98	90
8	53	54	49	b52	38	47	159	361	157	107	94	87
9	54	54	b48	b49	40	47	157	350	152	107	94	90
10	56	54	b46	b47	115	47	164	331	150	109	94	90
11	54	53	b44	b46	236	47	179	305	143	111	96	90
12	54	53	b44	b50	292	45	216	297	145	111	100	87
13	54	53	b47	b52	147	42	*276	281	140	120	96	90
14	53	53	b49	b51	115	42	390	263	136	115	96	87
15	53	47	b52	b50	100	42	504	247	138	107	96	87
16	53	51	b53	b49	115	47	545	226	138	102	96	87
17	53	49	53	b49	85	58	*560	218	136	100	96	87
18	53	47	53	b50	77	56	601	210	131	100	96	87
19	53	47	53	b49	73	58	621	196	129	102	96	87
20	53	49	54	b50	71	60	641	186	128	102	96	87
21	51	51	54	b48	68	66	530	200	129	102	96	87
22	56	49	51	b46	82	66	469	196	127	102	96	85
23	54	49	47	a43	60	75	463	181	127	104	98	85
24	53	49	47	a44	60	66	495	*181	122	104	96	85
25	53	49	49	a45	54	71	509	181	122	107	96	85
26	51	51	49	a51	53	100	509	183	122	107	96	83
27	54	51	b47	a51	b53	155	472	186	118	104	94	79
28	80	49	47	a52	*554	159	624	181	136	98	82	85
29	54	48	*47	a50	-----	113	501	181	*118	98	82	85
30	53	*49	47	a48	-----	107	*404	176	113	98	82	85
31	53	-----	45	a47	-----	118	-----	174	-----	*100	92	-----
Total	1,631	1,539	1,533	1,514	2,268	2,094	11,056	7,977	4,212	3,266	2,965	2,625
Mean	52.6	51.3	49.5	48.8	81.0	67.2	369	257	140	106	95.7	87.5
Ac-ft	3,240	3,050	3,040	3,000	4,500	4,130	21,930	15,820	8,350	6,520	5,880	5,210

Calendar year 1961: Max 95 Min 42 Mean 57.1 Ac-ft 41,320
 Water year 1961-62: Max 641 Min 36 Mean 117 Ac-ft 84,070

Peak discharge (base, 140 cfs)

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

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
2-12	1500	3.44	377				
3-27	2300	3.17	294				
4-20	0100	4.94	830				

BEAR RIVER BASIN

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

Location.--Lat 41°50', long 112°03', in SE $\frac{1}{4}$ sec.27, T.13 N., R.2 W., on right bank 3,600 ft downstream from Cutler Dam and 4 miles north of Collinston.

Records available.--June 1912 to September 1962. Prior to 1915, published as Hammond ditch near Collinston. Monthly discharge only for some periods, published in WSP 1314.

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

Average discharge.--50 years, 50.5 cfs (36,560 acre-ft per year).

Extremes.--1912-62: Maximum daily discharge, 182 cfs June 28, July 1, 1932, June 27, 28, 1933, May 17, 1960; no flow at times in each year.

Remarks.--Records good. Canal diverts from east side of Bear River in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.26, T.13 N., R.2 W., at dam at which West Side Canal and intake of Cutler powerplant also divert. Water from this canal and West Side Canal used for irrigation of about 58,000 acres below station in eastern Box Elder County.

Cooperation.--Gage-height record and five discharge measurements furnished by Utah Power & Light Co.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	*8.6						0	23	174	142	146
2	11	8.4						0	23	173	142	146
3	18	8.4						56	23	174	142	145
4	25	8.1						52	22	173	139	136
5	29	7.7						57	*22	174	144	132
6	26	7.5						68	22	173	158	128
7	28	7.5						90	22	172	163	123
8	29	7.3	(*)					90	24	171	157	117
9	29	*6.9						92	34	169	158	112
10	27	4.2						97	60	170	161	*106
11	22	0						107	77	*173	162	106
12	21	0						109	82	174	160	106
13	21	0						115	*118	156	157	97
14	21	0						119	144	133	157	94
15	21	0						109	143	127	156	96
16	21	0						109	143	130	*153	94
17	22	0						109	142	134	153	94
18	22	0						109	148	142	152	94
19	22	0						109	*159	146	152	94
20	22	0						109	166	144	152	92
21	22	0						71	166	144	157	83
22	22	0						41	168	144	156	75
23	22	0						43	168	144	155	74
24	21	0						47	172	142	154	74
25	21	0						47	175	141	154	73
26	21	0						46	174	140	154	72
27	21	0						45	173	140	154	71
28	21	0						32	165	140	149	64
29	21	0						15	174	140	145	57
30	21	0						12	174	*141	144	55
31	18	---						17	---	135	146	---
Total	679.4	74.6	0	0	0	0	0	2,122	3,306	4,733	4,728	2,956
Mean	21.9	2.43	0	0	0	0	0	68.5	110	153	153	98.5
Ac-ft	1,350	148	0	0	0	0	0	4,210	6,560	9,390	9,380	5,860

Calendar year 1961: Max 175 Min 0 Mean 57.9 Ac-ft 41,960
 Water year 1961-62: Max 175 Min 0 Mean 51.0 Ac-ft 36,900

* 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°50', long 112°04', in SW¹ sec.27, T.13 N., R.2 W., on left bank 4,200 ft downstream from Cutler Dam and 4 miles north of Collinston.

Records available.--June 1912 to September 1962. Monthly discharge only for some periods, published in WSP 1314.

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

Average discharge.--50 years, 235 cfs (170,100 acre-ft per year).

Extremes.--1912-62: Maximum daily discharge, 751 cfs June 24, 25, 1959; no flow for periods in every year except 1914.

Remarks.--Records good except those for periods of ice effect or no gage height record, which are fair. Canal diverts from west side of Bear River in NW¹SW¹ sec.26, T.13 N., R.2 W., at dam at which Hammond (East Side) Canal and intake of Cutler powerplant also divert. Water from this canal and Hammond (East Side) Canal used for irrigation of about 58,000 acres below station in eastern Box Elder County.

Cooperation.--Gage-height record and 9 discharge measurements furnished by Utah Power & Light Co.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	115	*56	42	27	11	8.3		0	74	719	592	530
2	115	56	40	26	11	9.3		0	79	721	611	550
3	111	55	40	26	11	9.9		237	101	721	634	622
4	113	54	38	26	11	10		220	154	723	653	615
5	115	53	36	26	11	7.4		242	*155	721	665	609
6	113	52	36	26	*11	6.9		246	150	725	661	594
7	109	51	*36	27	11	*6.9		299	*176	729	659	592
8	106	*50	35	27	11	6.9		350	189	729	657	594
9	106	55	35	27	11	6.9		410	224	719	651	584
10	101	64	36	27	11	7.2		459	271	701	639	*561
11	93	64	34	27	11	7.7		535	330	*701	641	544
12	90	64	32	27	11	8.0		540	404	707	626	527
13	89	63	32	27	11	*7.7		577	*564	624	613	502
14	88	32	*32	27	11	7.7		575	613	491	615	500
15	86	61	32	27	10	7.2		461	611	488	639	495
16	86	59	33	27	8.5	6.2		467	620	497	*661	488
17	86	58	34	29	8.5	6.2		616	665	535	661	481
18	85	58	34	29	8.5	6.5		580	661	575	669	468
19	84	59	30	29	8.5	6.7		580	*691	590	685	464
20	84	59	27	29	8.5	6.7		589	703	599	681	461
21	84	58	26	29	8.5	6.2		379	703	609	681	449
22	84	61	30	29	8.5	6.2		267	709	624	685	450
23	84	61	27	29	8.5	6.2		217	719	615	665	470
24	83	61	27	29	8.8	6.2		212	715	599	679	481
25	81	62	27	*29	8.8	6.2		196	717	603	661	440
26	79	62	27	20	8.8	6.2		181	725	615	661	439
27	77	53	27	11	8.8	4.2		181	731	632	661	428
28	75	48	27	11	9.6	*0		127	729	632	659	411
29	74	48	26	11	-----	0		61	727	616	653	398
30	72	47	26	11	-----	0		80	721	*598	657	344
31	64	-----	26	11	-----	0	-----	78	-----	582	641	-----
Total	2,832	1,714	990	763	276.8	192.7	0	9,964	14,651	19,736	20,230	15,249
Mean	91.4	57.1	31.9	24.6	9.89	6.22	0	322	488	637	653	508
Ac-ft	5,620	3,400	1,960	1,510	549	382	0	19,800	29,060	39,150	40,130	30,250

Calendar year 1961: Max 724 Min 0 Mean 261 Ac-ft 189,300
 Water year 1961-62: Max 731 Min 0 Mean 237 Ac-ft 171,800

* Discharge measurement or observation of no flow made on this day.
 Note.--No gage-height record Oct. 24-28. Stage-discharge relation affected by ice Dec. 11, 26, 27, Jan. 9 to Feb. 15 (no gage-height record Jan. 25 to Feb. 2).

BEAR RIVER BASIN

10-1180. Bear River near Collinston, Utah

Location.--Lat 41°50', long 112°03', in NW¼SE¼ sec.27, T.13 N., R.2 W., on right bank 600 ft downstream from Cutler plant of Utah Power & Light Co., 2,000 ft downstream from Cutler Dam, and 5½ miles north of Collinston.

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

Records available.--July 1889 to September 1962. Published as "at Collinston" prior to 1900. Monthly discharge only for some periods, published in MSP 1314.

Gage.--Water-stage recorder. Datum of gage is 4,276.13 ft above mean sea level (levels by Bureau of Reclamation). Prior to Nov. 8, 1913, staff gage and Nov. 8, 1913, to Sept. 10, 1938, water-stage recorder, at site three-quarters of a mile downstream at different datums.

Extremes.--Maximum discharge during year, 9,710 cfs Feb. 14 (gage height, 8.23 ft); minimum daily, 19 cfs June 23-25.

1889-1962: Maximum discharge observed, 11,600 cfs June 7-10, 1909 (gage height, 7.70 ft, site and datum then in use); minimum daily, 10 cfs Aug. 4-12, 18-23, 1905; practically no flow at 12 p.m. Aug. 5, 1920.

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

Cooperation.--Eight discharge measurements furnished by Utah Power & Light Co.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	274	593	1,100	277	590	1,590	1,760	4,500	2,120	20	21	22
2	464	593	736	887	842	1,750	1,700	4,330	2,010	20	21	22
3	460	1,140	249	947	839	1,740	1,920	3,760	2,160	20	21	22
4	624	684	783	903	228	1,870	1,570	3,500	2,005	20	22	22
5	703	552	873	861	838	1,880	1,680	3,130	*2,070	20	22	23
6	844	830	868	704	*697	1,710	1,280	2,950	2,120	20	24	22
7	480	520	*585	380	893	1,710	1,000	3,010	2,000	20	24	25
8	432	754	1,290	703	970	1,940	2,760	3,080	1,950	21	23	22
9	124	*619	433	1,140	1,020	1,860	2,090	2,950	1,960	21	22	22
10	608	924	354	922	2,240	1,380	2,520	2,680	1,550	21	21	*23
11	596	35	858	808	3,850	1,380	2,640	2,770	926	*21	23	22
12	538	631	625	816	3,840	1,990	2,840	2,810	908	22	23	22
13	651	848	396	710	*6,280	*1,870	2,820	2,810	934	23	22	22
14	535	943	*497	110	8,210	1,450	2,900	2,590	845	21	22	22
15	431	755	497	870	8,130	1,420	3,040	2,680	74	22	22	22
16	515	949	422	841	6,480	1,500	3,270	2,310	527	75	*22	21
17	472	1,090	702	777	5,640	1,180	3,460	1,940	28	404	22	21
18	475	365	741	827	4,690	224	3,670	2,180	21	474	22	21
19	438	27	692	718	3,270	1,970	3,840	1,600	25	332	22	21
20	608	605	1,220	682	2,310	1,560	3,800	1,170	21	184	21	21
21	587	799	1,180	52	2,980	1,380	3,850	1,300	21	21	21	21
22	235	922	1,020	624	2,950	1,430	3,880	1,470	20	44	21	21
23	785	26	788	900	2,390	1,630	3,860	1,630	19	76	21	21
24	363	868	717	530	1,260	1,810	3,880	1,840	18	23	21	21
25	518	584	527	680	1,070	1,760	*3,880	1,680	19	21	21	21
26	637	577	1,240	782	1,700	1,520	3,880	1,470	20	36	21	21
27	695	1,120	843	682	2,250	1,420	3,980	1,050	20	21	21	21
28	747	1,140	1,020	611	2,050	1,350	4,380	1,660	20	21	21	23
29	581	1,060	1,000	847	-----	1,490	4,740	1,680	21	21	21	22
30	724	1,190	513	1,060	-----	1,720	4,740	1,780	20	*21	22	21
31	614	-----	526	942	-----	1,650	-----	1,960	-----	21	22	-----
Total	16,539	22,023	23,555	22,473	79,597	49,114	91,630	74,670	24,448	2,107	675	653
Mean	573	734	760	725	2,843	1,584	3,054	2,409	815	66.0	21.8	21.8
Ac-ft	33,000	43,680	46,720	44,570	157,900	97,420	181,700	148,100	48,490	4,180	1,340	1,300

Calendar year 1961: Max 1,680 Min 21 Mean 508 Ac-ft 368,200
 Water year 1961-62: Max 8,210 Min 19 Mean 1,117 Ac-ft 808,400

* Discharge measurement made on this day.