

FIRST ANNUAL REPORT

BEAR RIVER
COMMISSION

1958

For the Report-Year October 1, 1957 to
September 30, 1958

LOGAN, UTAH

March 6, 1959

IN MEMORIAM



MARK R. KULP
Idaho State Reclamation Engineer

Bear River Compact Commission, 1948-58

Bear River Commission, 1958

BEAR RIVER COMMISSION

P. O. BOX 413
LOGAN, UTAH

March 23, 1959

Mr. President:

The First Annual Report of the Bear River Commission is transmitted herewith in accordance with Article III D 2 of the Bear River Compact.

Copies of this report with enclosures are being transmitted to the Governors of each of the Bear River Basin States.

Very truly yours,

Wallace N. Jibson
Assistant Secretary

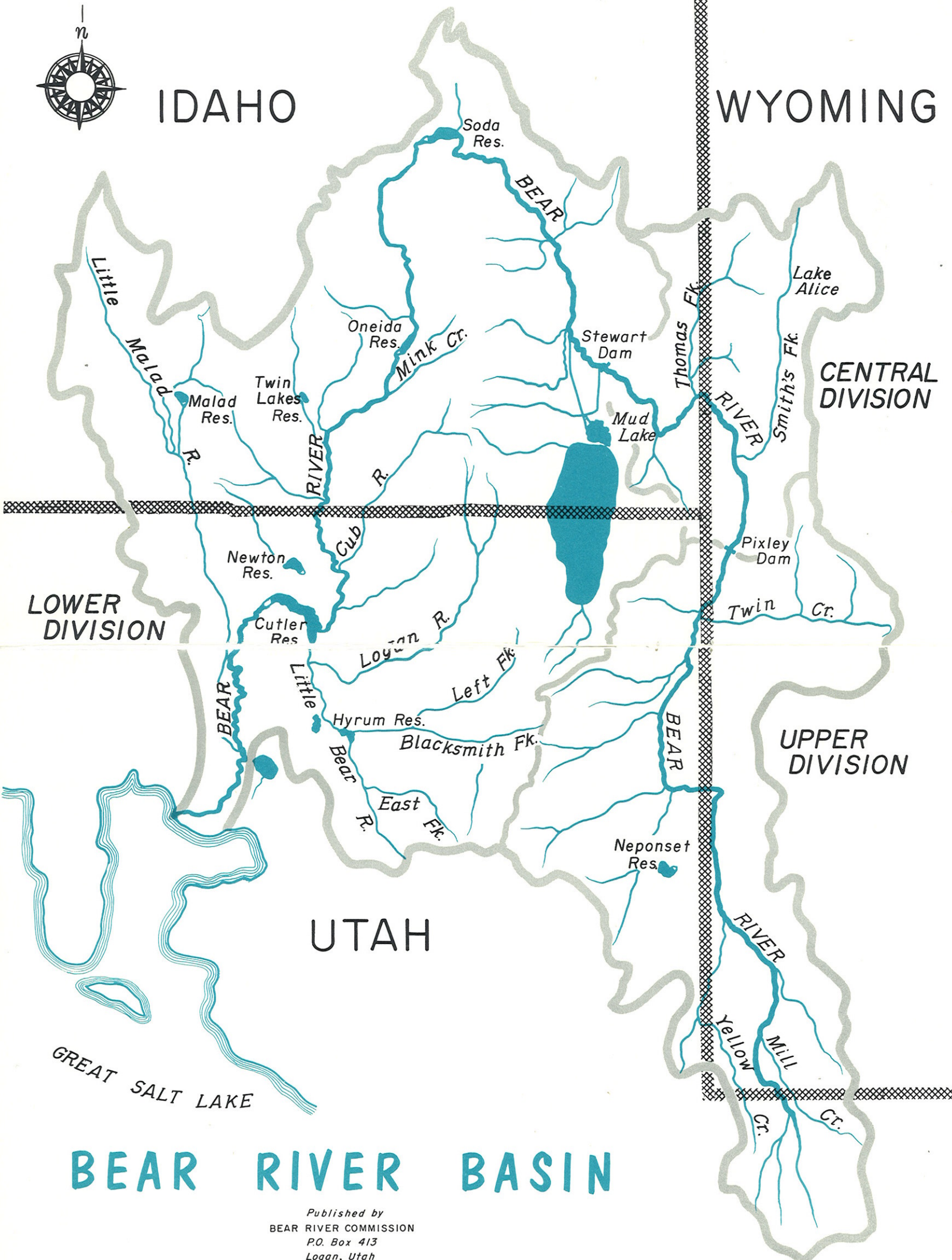
THE PRESIDENT,
The White House.

Enclosure



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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FIRST ANNUAL REPORT
of the
BEAR RIVER COMMISSION

March 6, 1959

GENERAL

I. Introduction

Congressional consent for negotiation of a compact among the States of Idaho, Utah, and Wyoming to determine the rights and obligations of those States concerning the waters of the Bear River was given in the Act of July 24, 1946 (60 Stat. 658). Authorization of the Compact by legislatures of the three States was given as follows:

Idaho—Chapter 90 of the Idaho Session Laws of 1943

Utah—Section 73-2-8, Utah Code Annotated, 1953, and Laws of Utah, 1953, Chapter 133, Sections 1 and 2.

Wyoming—Section 71-2601, Wyoming Compiled Statutes, 1945.

After many years of negotiation, agreement by the Compact Commission was reached February 4, 1955 in Salt Lake City. Ratification of the Compact by legislature of:

Utah, February 26, 1955

Idaho, March 15, 1955

Wyoming, February 9, 1957

Federal consent legislation was approved by the President of the United States, March 17, 1958.

The Bear River Commission was duly organized in Salt Lake City, April 5, 1958. By-laws were adopted by this Commission, April 26, 1958.

The main purposes of the Compact are stated in paragraph A of article I of the Compact, which reads:

“The major purposes of this compact are to remove the causes of present and future controversy over the distribution and use of the waters of the Bear River, to provide for efficient use of water for multiple purposes, to permit additional development of the water resources of Bear River, and to promote interstate comity.”

To accomplish these purposes, the Compact—

(1) Establishes an interstate agency, entitled Bear River Commission, which administers the terms of the Compact.

(2) Divides the Bear River basin into three Divisions for purposes of compact administration of direct flows. The Divisions were established with respect to hydrologic and physical characteristics and do not conform with State boundaries. Each Division covers portions of two of the three States.

(3) Provides for apportionment of the direct flows of Bear River and its tributaries among separate Sections of States within each of the three Divisions.

(4) Defines total storage rights for each of the three States for reservoirs heretofore developed upstream from Stewart Dam (the dam which diverts water from Bear River into the Bear Lake inlet canal).

(5) Establishes additional rights for future storage and use of water upstream from Stewart Dam, and allocates such rights among the three States.

(6) Reserves a portion of the storage capacity in Bear Lake for primary use by, and protection of, irrigation uses and rights downstream from Stewart Dam.

II. Organization

Organizational meetings of the Commission were held April 5 and 26, 1958. Credentials of members selected by the Governors of Utah, Wyoming, and Idaho were submitted at the first meeting, and accreditation was duly made. The Federal Representative was appointed June 16, 1958 by the President of the United States.

Organization of the Bear River Commission is as follows:

OFFICERS

Chairman.....	E. O. Larson, Salt Lake City, Utah
Vice-Chairman	Fred M. Cooper, Grace Idaho
Secretary-Treasurer	Jay R. Bingham, Bountiful, Utah
Assistant Secretary	Wallace N. Jibson, Logan, Utah

MEMBERS

Idaho

Fred M. Cooper.....	Grace, Idaho
Melvin Lauridsen	Montpelier, Idaho
George N. Carter	Boise, Idaho

Utah

Jay R. Bingham.....Bountiful, Utah
Lawrence B. Johnson.....Randolph, Utah
A. V. SmootCorinne, Utah

Wyoming

Earl LloydCheyenne, Wyoming
S. Reed DaytonCokeville, Wyoming
J. W. Myers.....Evanston, Wyoming

United States

E. O. Larson.....Salt Lake City, Utah

COMMITTEES

Budget

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

Operations

Fred M. Cooper.....Grace, Idaho
Lawrence B. Johnson.....Randolph, Utah
S. Reed Dayton.....Cokeville, Wyoming

The Commission selected Logan, Utah, as the principal office and place of business. A cooperative program with the U.S. Geological Survey was recommended by the Commission and subsequently approved by the Federal Agency. This program, initiated at the beginning of the 1959 fiscal year, provides for a basin office (Logan) to maintain a gaging-station network required for determination of the water resources of Bear River basin and for the administration of the Bear River Compact.

The Project Engineer in charge of the Geological Survey, Logan Office, also serves as Assistant Secretary to the Commission with the responsibility of providing technical assistance and current stream-flow data to the Commission as required in the administration of the Compact. He establishes operational procedures, prepares hydrologic studies as required, and maintains the files and records of the Commission.

The compensation and expenses of the Federal Representative and each Commissioner and Advisor are paid by the Government he represents.

All expenses incurred by the Bear River Commission are paid by the signatory States on an equal basis. That portion of the program devoted to operation and maintenance of the gaging-station network is financed equally by the Geological Survey and the Commission. That portion of the cooperative program dealing with compact administration is financed wholly by the Commission.

III. Meetings

April 5, 1958 — Salt Lake City, Utah — Organizational Meeting

April 26, 1958 — Salt Lake City, Utah — Organizational Meeting

June 17, 1958 — Montpelier, Idaho — Operational Meeting

IV. Budget and Fiscal Disbursements—Auditor's Report

ADOPTED BUDGET

	Fiscal Year Ending 6-30-1959	Fiscal Year Ending 6-30-1960	Fiscal Year Ending 6-30-1961	Total Biennium Ending 6-30-1961
Compact Administration				
Personal Services	\$ 6,640	\$ 6,900	\$ 7,200	\$14,100
Travel and Subsistence.....	1,200	1,200	1,200	2,400
General Office Expense.....	610	700	700	1,400
Printing and Reproduction.....	700	700	700	1,400
Treasurer (Bond and Audit)....	400	400	400	800
Transcribing Minutes	150	150	150	300
Fiscal Unit Charge	350	400	400	800
Miscellaneous	300	300	300	600
Sub-Totals	\$10,350	\$10,750	\$11,050	\$21,800
Stream Gaging Program				
Geological Survey	28,920	29,500	30,100	59,600
Totals	\$39,270	\$40,250	\$41,150	\$81,400

ALLOCATION OF BUDGET

United States (Geo. Survey).....	\$14,460	\$14,750	\$15,050	\$29,800
State of Idaho.....	8,270	8,500	8,700	17,200
State of Utah.....	8,270	8,500	8,700	17,200
State of Wyoming.....	8,270	8,500	8,700	17,200
Totals	\$39,270	\$40,250	\$41,150	\$81,400

Since there were no receipts or expenditures of the Commission during the fiscal year ended June 30, 1958, there is no schedule of disbursements or audits to be reported; receipts and disbursements for the fiscal year ended June 30, 1959 will be a part of the second annual report of the commission.

V. Administration

The Bear River Commission is charged with the enforcement of the Compact. Administration of water rights within each signatory State is in accordance with State law, subject to interstate limitations as provided in the Compact.

Records needed by the Commission to compute interstate allocations of direct flow and determine compliance therewith were collected by local State-employed Water Commissioners and the Geological Survey. The Assistant Secretary received and computed these records currently and made available to representatives of the Commission the sum of diversions and resulting compact allocations by State Section.

Efficient administration of direct-flow provisions of the Compact requires rapid and accurate collection and processing of field data; also orderly regulation, when required, without undue delay. Operation during the first season points out a deficiency in record collection and regulatory procedures on diversions. This was particularly true in the Upper Wyoming Section of the Upper Division in which are located half of the total diversions above Bear Lake.

Many diversions are located at some distance from public roads, necessitating time-consuming hikes by water officials. In many instances nominal improvement of farm access roads would facilitate measurements and regulation. Headworks which can be quickly and accurately regulated are essential to satisfactory operation, yet many diversions are not equipped with such structures. Standard measuring devices, such as Parshall flumes, are feasible and recommended on all smaller ditches and many larger diversions. Streamflow measurements are now secured with current meter using stage-discharge rating curves. This requires additional time and, due to variable backwater in most channels, is less accurate. On a number of larger, flat-gradient diversions, however, the current meter is most practical. It is essential that local Water Commissioners be capable of making accurate current meter measurements.

Wyoming officials in charge of water administration are insisting that individual users install suitable headworks, where lacking, as required by State law. As a result, definite progress was noted during the year with several new structures being installed.

VI. Stream-Gaging Program

Daily streamflow or reservoir records were secured at 44 gaging stations in Bear River basin (excluding Malad River). Of these stations, 33 are operated by the Geological Survey and 11 by Utah Power & Light Company under FPC license. In addition, seasonal daily or partial records were secured by local Water Commissioners on approximately 130 diversions above Bear Lake. Spot-checking of diversion measurements for adherence to compact standards was performed by Geological Survey personnel.

Geological Survey or Power Company streamflow records which are required to administer direct-flow provisions of the Compact are published herein in addition to other selected records at key stations in the basin. (See pages 29-38). These records are not yet reviewed for publication in Geological Survey Water-Supply Papers and are to be considered as provisional pending final review by that agency. Daily diversion records collected by local water officials are published herein for all diversions in the Central Division. (See Tables 1-4.) Those in the Upper Division are not tabulated individually, but are shown graphically by State sections on plates 2 and 3.

The additional Geological Survey records collected under the Co-operative Program are maintained for determination of water resources in the basin.

Compact provisions relating to Bear Lake irrigation reserve and storage provisions require analytical studies of water bypassing or released from Bear Lake. Most of Utah Power & Light Company records collected under FPC license are required in these studies. However, the analysis was not necessary for the 1958 water year since the elevation of Bear Lake remained continuously above the irrigation reserve (See plate 1) and water was stored above Bear Lake under new storage provisions of the Compact only during the non-irrigation season.

VII. Water Supply and Hydrologic Data

Precipitation and resulting streamflow in the upper Bear River basin was below normal for the 1958 water year, and was very defi-

cient during the late summer months. Supply to the Upper and Central Divisions was about 80% of normal during the irrigation season. Cache Valley runoff in the Lower Division was slightly above normal.

Bear Lake storage content in contrast to river flow, remained well above normal during the water year. (See plate 1.) Water-surface elevations of Bear Lake ranged from four feet to more than seven feet above the irrigation reserve (5,913.24 ft.) as provided in the Compact. The present reserve was ordered by the Commission under Article V B of the Compact which provides that for each 5,000 acre-feet of new upstream storage the irrigation reserve shall be increased by a specified amount to compensate for the effect on Bear Lake. A new reservoir on Sulphur Creek in Wyoming (4,614 ac-ft.) necessitated this increase. The net decrease in contents was negligible for the water year. No difficulty was experienced in filling other irrigation reservoirs in the basin.

VIII. Weather Modification Program

Utah Power and Light Company, by agreement with a weather consultant firm, has been engaged in a cloud-seeding program over part of the Upper Bear River basin since 1955. This operation, conducted from October 15 to May 31 each year, employs silver iodide smoke generators situated at strategic points over the drainage basin.

It is maintained that an approximate 10-percent increase in precipitation has resulted over the target area, and that water supply available for storage in Bear Lake has been increased by these operations.

IX. Compact Operation

A. Upper Division

The Upper Division comprises that portion of Bear River basin above and including Pixley Dam. Two sections in each of the States of Wyoming and Utah are included in this division. The Compact provides that when the divertible flow—total diversions in the Division plus flow passing Pixley Dam—is less than 1,250 cfs, a water emergency exists and such divertible flow is allocated to the river 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

This point was reached June 21, 1958 and interstate regulation was initiated under terms of the Compact. Hydrographs showing diversions, divertible flow, and compact allocations in the Upper Division are shown on plates 2 and 3. Initial regulation required a 26-percent reduction in Upper Wyoming Section diversions. About four days were required to regulate diversions in this section. Part of this lag could have been prevented with more adequate regulatory head-works. Current progress in providing such works will materially improve this condition. Section diversions were maintained within practical limits of allocations thereafter until about July 10 when further interstate regulations became impractical due to diminished supplies. A small reduction in diversions was also required in Upper Utah Section which is limited to 0.6 percent of the divertible flow.

As noted on the hydrographs, Lower Utah Section received benefit from regulation in the upper sections. Available irrigation supplies after June 21, 1958, however, were soon depleted. Past records indicate that in other dry years of record (1954) regulation would have begun at an earlier date, thus equalizing rate of diversion for a somewhat longer period.

During the period of regulation, flow leaving the Division past Pixley Dam ranged from 77 to 47 cfs. This additional flow was available for diversion at Pixley Dam. Other canals in the Lower Wyoming Section (B. Q. Dam) diverted to the limit of available supplies. The Section diverted or could have diverted its compact allocation during the period of interstate regulation.

In the Upper Wyoming Section total water diverted was computed from current meter measurements made at about twice-weekly intervals during the relatively short period of regulation. Compact allocations and compliance with compact provisions in all sections of the Division were based in part on these determinations. Therefore, hydrographs incorporating this data should not be considered accurately detailed on a daily basis.

B. Central Division

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

Article IV of the Compact provides that when either the divertible flow in the Division is less than 870 cfs, or the flow at Bear River at

Border gaging station is less than 350 cfs, whichever shall first occur, a water emergency shall be deemed to exist and total Wyoming diversions are limited to 43 percent of the divertible flow.

Flow passing the Border gaging station decreased below 350 cfs. June 29, 1958 (divertible flow, 1,037 cfs). Initial regulation required a 7-percent reduction in Wyoming diversions. Some difficulty was experienced in attaining full compliance with compact allocations during most of July, resulting in a 14-percent excess in diversions for the month. Very good compliance was obtained thereafter for the balance of the season. Water officials were called upon to resolve several questions relative to water rights which arose among Wyoming users, causing the difficulties mentioned above. Problems of this nature should therefore be of lesser consequence in future years.

Hydrographs of streamflow and compact allocations are shown on plates 4 and 5. Tabulations of individual diversions, section totals, and resulting apportionment to State sections in the Central Division are shown in tables 1-4.

The Compact provides that water emergencies shall terminate on October 15, unless terminated sooner or extended by the Commission. Idaho diversions were shut off or reduced to stock water October 1st in compliance with State law. Accordingly, the existing water emergency was terminated as of that date.

To appraise the net effect of compact regulation in the Central Division, comparative studies were made of that portion of total supply entering the Division which flows into Idaho. These studies indicate that of the primary supply (July-September) 14 percent more entered Idaho in 1958 than in the comparably dry year of 1954.

The following tabulation also indicates the effect of interstate regulation:

DIVERSIONS IN ACRE-FEET PER ACRE

June-September

	1954	1956	1958
Wyoming Section	4.86	5.40	4.00
Idaho Section*	2.01	2.61	2.54

*Does not include diversion to Bear Lake or flow passing Stewart Dam.

C. Lower Division

A water emergency in the Lower Division is not initiated by specified river discharge or divertible flow as in the two divisions above. However, the Compact provides that the Commission has authority to declare a water emergency upon its own motion, or through petition of an aggrieved Utah water user against users in Idaho. Upon declaration of such an emergency, the Commission is required to put into effect water delivery schedules based on priority of rights without regard to State boundary lines.

There were no water-user petitions filed during the year, nor did the Commission on its own motion declare a water emergency as described above.

D. Interstate Tributaries

Controversy which may arise on interstate tributaries of Bear River is provided for in Article IV of the Compact. When the flow across a State line is insufficient to satisfy water rights on such a tributary in a lower State, any water user may file a petition with the Commission alleging that by reason of diversions in the upstream State he is being deprived of water to which he is justly entitled and that by reason thereof a water emergency exists, and requesting distribution of water under direction of the Commission. If the Commission finds such an emergency exists and interstate control is necessary, it shall put into effect water delivery schedules based on priority of rights without regard to State boundary lines.

There were no petitions of such nature filed with the Commission in 1958.

E. Storage Provisions

Storage provisions dealing with Bear River water are outlined in Article V of the Compact. Existing storage rights are defined for each of the three States in reservoirs constructed above the point of diversion to Bear Lake (Stewart Dam). Additional storage rights are granted to store in any water year above Stewart Dam, 35,500 acre-feet for use in Utah and Wyoming; and to store in any water year on Thomas Fork 1,000 acre-feet for use in Idaho. Such additional rights shall be subordinate to (1) existing direct-flow rights for consumptive use in any river division and (2) existing storage rights above Stewart Dam, but shall not be subordinate to any right to store

water in Bear Lake or elsewhere below Stewart Dam. One-half of the 35,500 acre-feet of additional storage right is granted to Wyoming and the remaining one-half to Utah.

Under the above provision one dam was constructed on Sulphur Creek in Wyoming. It impounded 4,614 acre-feet of water for irrigation in 1958. This amount was diverted from Sulphur Creek prior to the irrigation season and is charged to the Wyoming share of additional storage rights granted by the Compact.

Gaging stations were installed above and below Sulphur Creek Reservoir by the water users. Their operation and maintenance was taken over by the Geological Survey under cooperative agreement with the Commission.

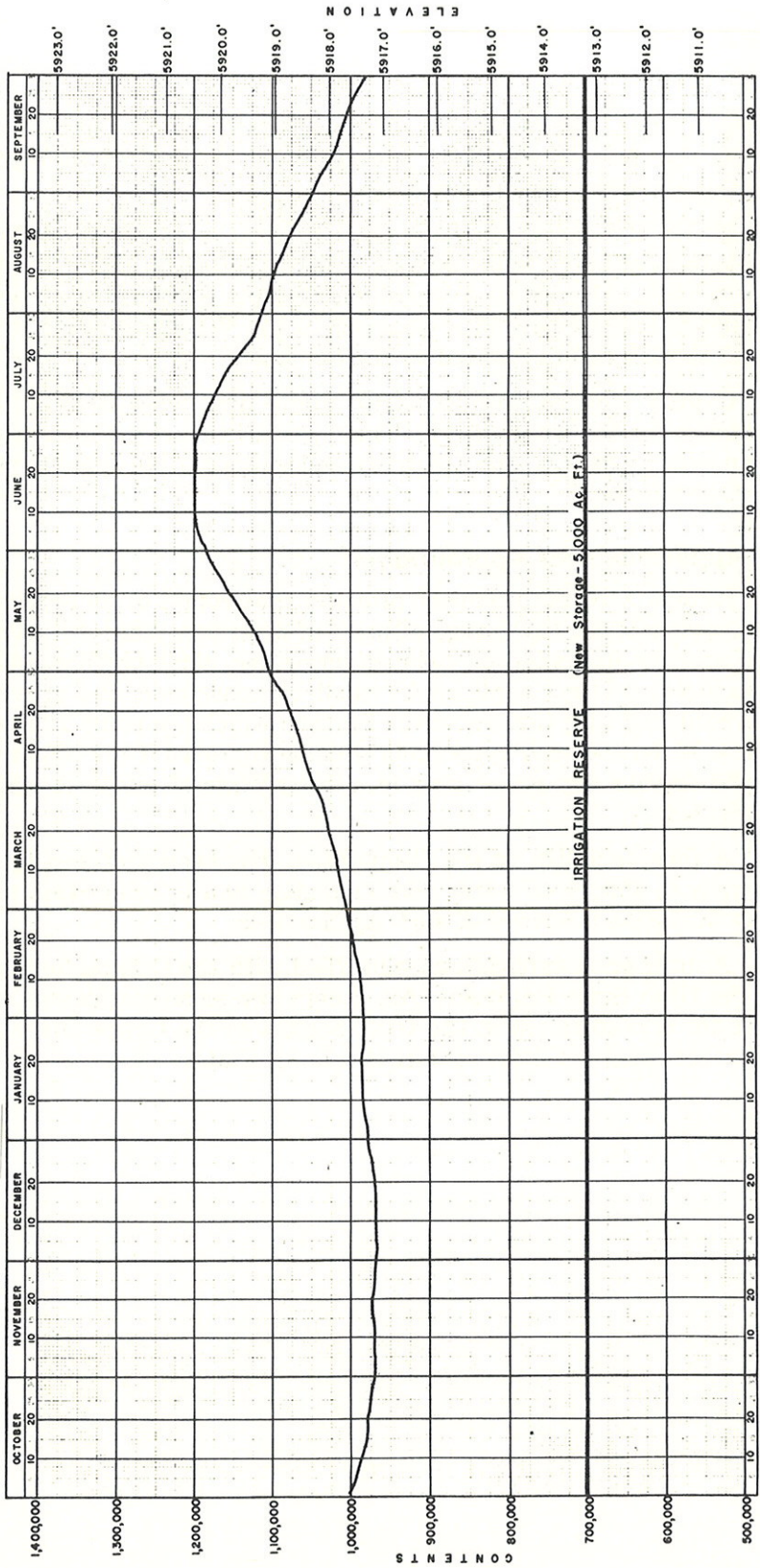
X. Applications for Appropriation

Article X of the Compact provides that copies of all applications for appropriation, for change of point of diversion, place and nature of use, and for exchange of Bear River water, shall be filed with the Commission. These applications 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 deprive any water user in a lower State of water to which he is entitled.

A form, suitable to the Commission, has been prepared by State officials in charge of water administration and is being used to keep the Commission informed of such applications.

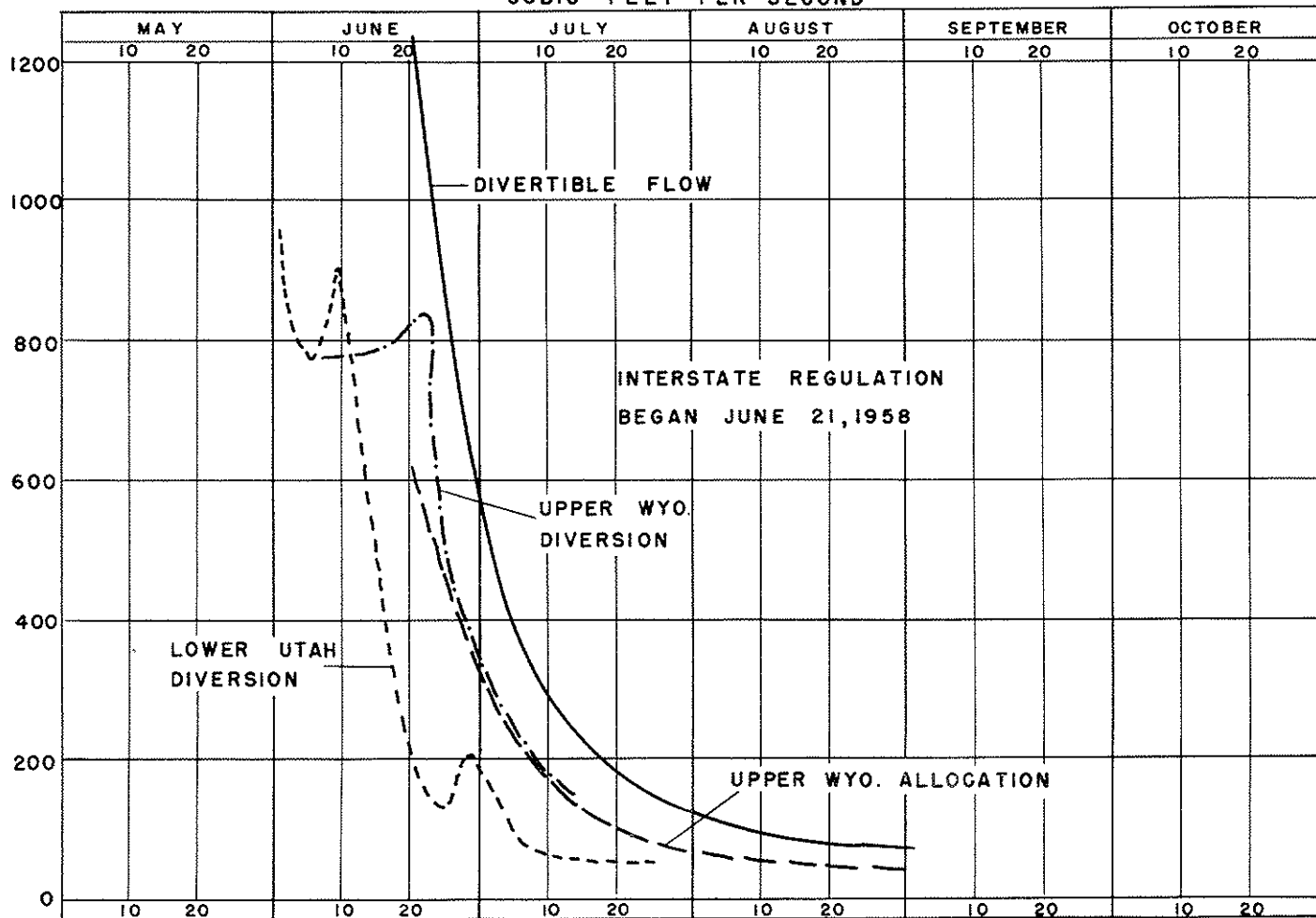
A number of applications were filed with the Commission in 1958 by the Utah State Engineer. All, except two small stockwater claims, were for appropriation in the Utah Section of the Lower Division and therefore could not affect a user in a lower State.

HYDROGRAPH FOR BEAR LAKE - Contents in Ac. Ft. - Elev. in Feet



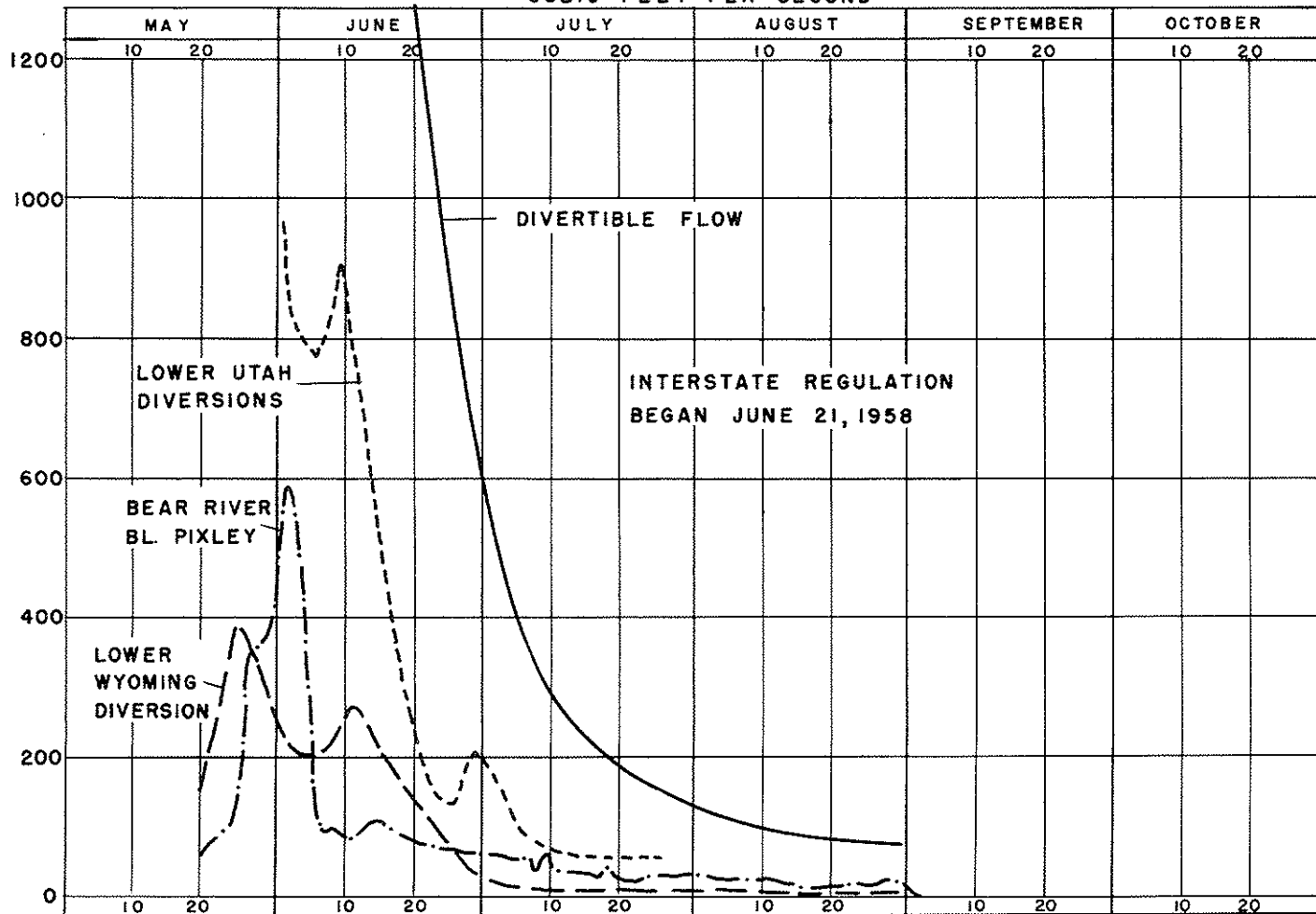
UPPER DIVISION - ALLOCATION & DIVERSION (Part 1)

CUBIC FEET PER SECOND



UPPER DIVISION-ALLOCATION & DIVERSION (Part 2)

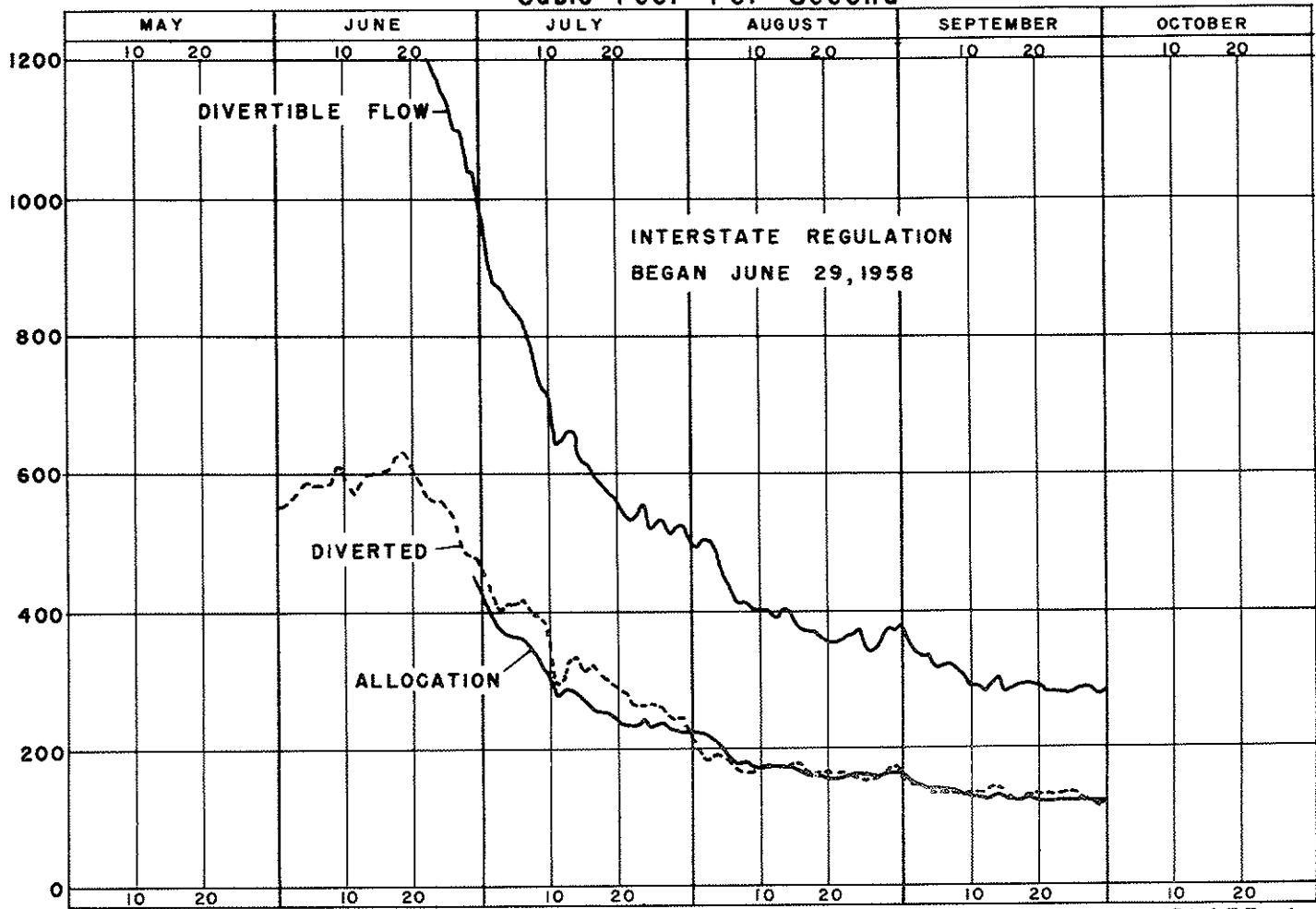
CUBIC FEET PER SECOND



22

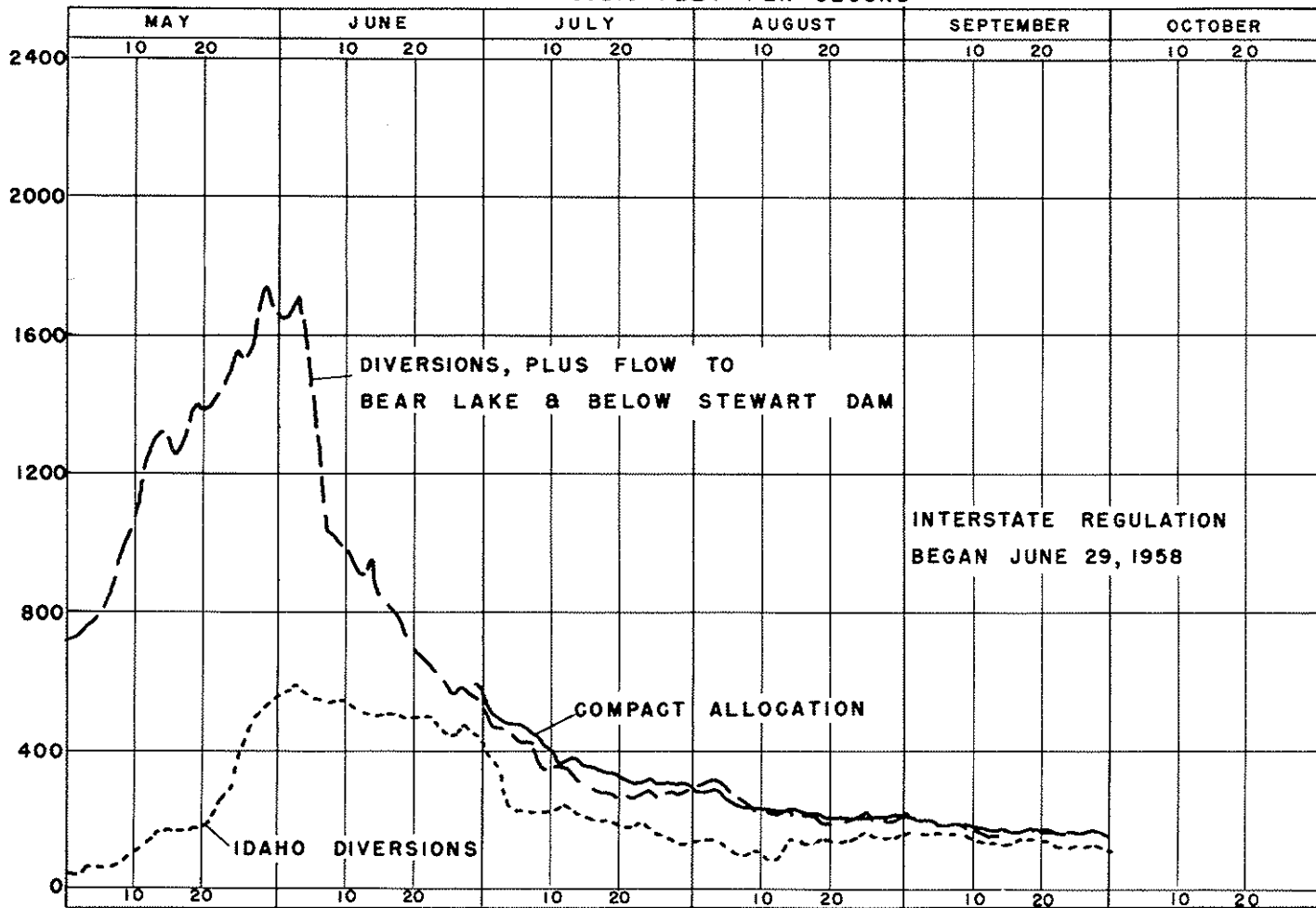
CENTRAL DIVISION - WYOMING ALLOCATION & DIVERSION

Cubic Feet Per Second



CENTRAL DIVISION - IDAHO ALLOCATION & DIVERSION

CUBIC FEET PER SECOND



24

DAILY DISCHARGE IN CFS OF SMITHS FORK & BEAR RIVER CANALS IN CENTRAL DIVISION WITH COMPACT ALLOCATIONS

JULY 1958			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
BEAR RIVER DIVISIONS																																						
BEAR RIVER CANALS																																						
GAFFNEY	2.1	2.2	2.0	1.8	1.5	1.3	1.1	.8	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	
SIGHTS	12	13	23	32	32	12	11	11	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
WEAVER DAM	20	19	20	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
WEAVER WEST	16	18	23	17	19	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
WEAVER EAST	16	18	23	17	19	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
COOK DAM	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
COOK WEST	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
COOK EAST	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
J. R. RICHARDS																																						
SMITHS FORK DIVISIONS																																						
SMITHS FORK CANALS																																						
PAINE CREEK	2.3	2.2	2.2	2.2	1.8	1.5	1.3	1.1	.8	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	
SMITHS FORK	12	13	23	32	32	12	11	11	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
WEAVER DAM	20	19	20	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
WEAVER WEST	16	18	23	17	19	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
WEAVER EAST	16	18	23	17	19	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
COOK DAM	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
COOK WEST	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
COOK EAST	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
J. R. RICHARDS																																						
SMITHS FORK DIVISIONS																																						
SMITHS FORK CANALS																																						
SMITHS FORK	2.3	2.2	2.2	2.2	1.8	1.5	1.3	1.1	.8	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	
SMITHS FORK	12	13	23	32	32	12	11	11	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
WEAVER DAM	20	19	20	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
WEAVER WEST	16	18	23	17	19	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
WEAVER EAST	16	18	23	17	19	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
COOK DAM	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
COOK WEST	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
COOK EAST	12	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
J. R. RICHARDS																																						

BEAR RIVER NEAR UTAH-WYOMING STATE LINE

Location. — Lat 40°58', long 110°51', in SE¹/₄ sec. 30, T. 3 N., R. 10 E., on left bank just downstream from West Fork and 2.8 miles upstream from Utah-Wyoming State line.

Drainage area. — 176 sq. mi.

Records available. — July 1942 to September 1958.

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

Average discharge. — 16 years, 189 cfs. (136,800 acre-ft. per year).

Extremes. — Maximum discharge during year, 1,920 cfs May 28 (gage height, 3.54 ft); minimum, 25 cfs. Apr. 10, but may have been less during periods of ice effect.

1942-58: Maximum discharge 2,800 cfs June 6, 1957 (gage-height 4.27 ft); minimum, 16 cfs Apr. 11, 1951, Nov. 5, 1954, Nov. 1, 1955, Oct. 30, 1956, but may have been less during periods of ice effect or no gage-height record.

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.

Bear River near Utah-Wyoming State line
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	54	b 48		b 40		40	84	1,020	244	51	33
2	42	48	b 48		b 40		40	106	1,100	214	48	31
3	55	54	b 48		42		38	137	1,030	199	47	30
4	68	51	b 48		40	b 44	38	183	1,000	214	42	32
5	58	58	47		40		38	244	1,000	176	42	32
6	61	52	48		40		40	322	1,170	166	40	31
7	54	59	47		b 40		40	375	1,440	156	38	30
8	48	55	48		b 40	44	40	343	1,290	149	38	30
9	48	50			40	44	38	381	992	143	36	31
10	47	51			40	b 44	36	458	800	134	36	30
11	47	54	b 48		40	b 44	38	564	710	120	34	30
12	48	51		b 40	b 41	b 42	36	578	628	115	34	35
13	47	52			42	42	38	446	523	106	34	78
14	50	52			40	42	42	381	496	103	38	48
15	52	55	48		42	42	51	322	516	101	38	42
16	48	b 50	48		40	40	62	312	523	98	36	40
17	50	b 45	48		42	b 39	80	404	523	88	36	40
18	48	b 43	b 48		44	38	115	571	550	90	40	40
19	55	b 41	b 48		42	42	118	775	557	86	44	38
20	59	b 42	b 48		42	40	115	1,000	543	84	36	38
21	59	b 42	b 48		42	38	115	1,110	510	82	36	35
22	58	b 44			42	38	103	1,150	471	76	38	34
23	56	b 47			46	38	88	1,220	452	71	38	35
24	61	b 48		42	44	38	76	1,360	446	64	35	36
25	55	53		42	44	38	73	1,370	421	61	33	36
26	54	b 55	b 45	40	44	38	69	1,490	354	59	32	36
27	56	b 50		40	b 42	42	71	1,650	312	58	33	36
28	58	b 48		40	b 42	40	68	1,630	298	55	42	36
29	50	b 48		42		38	69	1,480	270	52	42	34
30	56	b 48		40		40	74	1,380	252	54	36	30
31	56			42		38		1,080		56	33	
	1,648	1,498	1,456	1,248	1,163	1,277	1,889	22,906	20,197	3,474	1,186	1,087
MEAN ACRE- FEET	53.2	49.9	47.0	40.3	41.5	41.2	63.0	739	673	112	38.3	36.2
	3,270	2,970	2,890	2,480	2,310	2,530	3,750	45,430	40,060	6,890	2,350	2,160

b Stage-discharge relation affected by ice.

YEAR
OR
PERIOD

MEAN
ACRE-FOOT

162
117,100

SULPHUR CREEK ABOVE RESERVOIR, NEAR EVANSTON, WYOMING

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

Drainage area. — 64 sq mi, approximately.

Records available. — December 1957 to September 1958.

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

Extremes. — Maximum discharge during year, 560 cfs Apr. 18 (gage height, 5.07), from rating curve extended above 100 cfs by logarithmic plotting; no flow for many days.

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

Sulphur Creek above reservoir, near Evanston, Wyoming
Discharge, in cubic feet per second, water year October 1957 to September, 1958.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				2.7				22	12	0.8	0	0
2				2.7				24	9.5	.4	0	0
3			1.4	2.7	3.2			26	9.8	.3	0	0
4				2.7				25	8.6	.3	0	0
5				2.9				26	7.5	.2	0	0
6			1.8					29	7.5	.3	0	0
7			2.2					27	7.2	.3	0	0
8			2.5				6.0	19	6.2	.5	0	0
9			2.5					20	5.9	.7	0	0
10			2.5			3.5		23	5.4	.7	0	0
11			3.0					28	5.7	.5	0	0
12			3.0					37	4.8	.4	0	0
13			3.0					37	4.8	.2	0	0
14			3.3					43	4.8	.1	0	0
15				3.0				58	4.8	.1	0	0.1
16							10	55	4.8	.4	0	.1
17					3.5		125	40	3.3	.5	0	.1
18							292	44	3.0	.4	0	0
19						4.0	146	45	3.1	.1	0	.1
20							105	53	3.4	.1	0	.1
21						4.5	73	51	3.6	.1	0	0
22						5.2	47	61	4.1	0	0	0
23			3.5				29	45	3.8	0	0	0
24							27	40	3.3	0	0	0
25							37	34	6.2	0	0	0
26						6.0	36	32	8.1	0	0	0
27							28	29	4.1	0	0	.1
28				3.2			21	23	2.0	0	0	.2
29							20	17	1.6	0	0	.2
30							20	15	.9	0	0	.2
31			2.7					13		0	0	
			89.5	93.2	96.5	134.2	1,106.0	1,041	159.8	7.4	0	1.2
MEAN			2.89	3.01	3.45	4.33	36.9	33.6	5.33	0.24	0	0.04
ACRE-FOOT			178	185	191	266	2,190	2,060	317	15	0	2.4

Note. — Stage-discharge relation affected by ice Dec. 1 to Apr. 17. PERIOD _____ MEAN _____ 6.98 _____
ACRE-FOOT _____ 5,100 _____

SULPHUR CREEK BELOW RESERVOIR, NEAR EVANSTON, WYO.

Location. — Lat 41°09', long 110°49', in SE¼ SE¼ sec. 28, T. 14 N., R. 119 W., on left bank 6.3 miles upstream from mouth and 10½ miles southeast of Evanston.

Drainage area. — 68 sq mi., approximately.

Records available. — March to September 1958.

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

Extremes. — Maximum discharge during year, 82 cfs July 14, 15 (gage height, 2.82 ft); no flow for many days.

Remarks. — Records good. Flow regulated by Sulphur Creek Reservoir (capacity 4,600 acre-ft) completed December 1957.

Sulphur Creek below reservoir, near Evanston, Wyoming
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	4.0	11	2.8	32	9.4
2							0	3.2	6.6	0	31	9.8
3							0	0	0	0	29	9.8
4							0	0	0	0	24	9.4
5							0	0	0	0	21	9.4
6							0	0	0	0	21	8.8
7							0	0	0	0	21	8.8
8							0	0	0	0	21	8.4
9							0	0	0	15	31	8.1
10							0	0	0	62	39	9.4
11							0	19	0	71	42	14
12							0	56	0	70	43	14
13							0	56	0	70	42	13
14							0	56	0	76	42	13
15							0	56	0	77	38	12
16							0	56	0	69	36	7.2
17							0	57	4.6	66	34	7.2
18							0	57	14	54	36	7.5
19							0	57	13	46	36	7.5
20							0	57	8.8	46	35	7.2
21							0	57	8.8	48	27	7.2
22							1.5	58	8.8	51	22	6.8
23							4.4	58	13	47	14	6.8
24							34	54	24	40	7.5	3.5
25							58	42	16	38	8.1	2.0
26							58	42	6.5	38	8.4	1.9
27							57	31	6.5	37	8.4	1.6
28							57	11	13	37	8.8	1.6
29							48	11	18	36	9.1	1.6
30							5.0	11	11	34	9.1	1.5
31								11		33	9.1	

0 322.9 920.2 183.6 1,163.8 785.5 228.4

MEAN							0	10.8	29.7	6.12	37.5	25.3	7.61
ACRE- FEET							0	640	1,830	364	2,310	1,560	453

MEAN _____ 16.8 _____
ACRE-FOOT _____ 7,160 _____

CHAPMAN CANAL AT STATE LINE, NEAR EVANSTON, WYOMING

Location. — Lat 41°24', long 111°02', in SE $\frac{1}{4}$ sec. 36, T. 17 N., R. 121 W., on right bank at highway bridge, 6 $\frac{1}{2}$ miles downstream from headgates and 10 miles northwest of Evanston.

Records available. — October 1945 to September 1958 in reports of Geological Survey. April to September 1942 and May to September 1943 in upper Bear River water commissioner's reports, Utah; April 1944 to September 1948 in upper Bear River water commissioner's reports, Utah; and reports of Bear River Hydrometric Data (U.S. Geological Survey open-file report).

Gage. — Water-stage recorder. Prior to Oct. 11, 1946, staff gage at same site and datum.

Average discharge. — 13 years, (1945-58), 16.8 cfs. (12,160 acre-ft per year).

Extremes. — 1942-58: Maximum daily discharge observed, 129 cfs Apr. 14, 1946; no flow at times each year.

Remarks. — Records good. Canal diverts water from Bear River in NW $\frac{1}{4}$ sec. 36, T. 16 N., R. 121 W. Many diversions above station for irrigation in Wyoming. Flow at station is for storage in Neponset Reservoir, Utah, and irrigation in Saleratus Basin, Utah.

Chapman Canal at State Line, near Evanston, Wyoming
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	2.8				0	4.1	2.1	83	13	0	
2	0	3.6				0	4.1	2.1	87	13	0	
3	0	3.6				0	4.9	2.1	95	12	0	
4	0	3.2				0	4.9	2.1	97	12	0	
5	.1	4.2				0	4.9	2.2	90	3.2	0	
6	.6	3.6				0	4.6	2.2	83	4.0	0	
7	.6	3.2				0	50	3.8	106	4.2	0	
8	.9	3.4				0	64	21	122	4.2	0	
9	0	3.8				0	58	20	118	6.0	0	
10	0	3.0				0	61	21	98	8.0	0	
11	0	3.4				0	64	22	83	12	0	
12	0	4.5				0	66	22	80	8.2	0	
13	0	5.0				0	69	17	73	5.8	0	
14	0	5.0				0	75	23	58	3.8	0	
15	0	5.0				0	80	33	41	2.1	0	
16	0	5.0				0	55	33	43	1.2	0	
17	0	4.5				0	62	30	54	.2	0	
18	0	2.8				0	70	12	64	0	0	
19	0	3.0				0	66	27	61	.6	0	
20	0	3.4				15	55	68	57	.8	0	
21	0	0				25	52	70	66	1.6	0	
22	0	0				25	48	86	64	2.2	0	
23	0	0				20	46	81	64	2.2	0	
24	0	0				18	41	98	58	1.8	0	
25	0	0				16	42	123	57	1.1	0	
26	.7	0				10	5.5	104	58	.3	0	
27	1.5	0				13	3.6	100	45	0	0	
28	1.5	0				13	3.0	96	34	0	0	
29	1.6	0				13	2.8	92	25	0	0	
30	2.1	0				14	2.4	85	17	0	0	
31	2.2	0				16		87		0	0	
	11.8	76.0	0	0	0	228	1,416.3	1,387.6	2,081	123.5	0	0

Mean	0.38	2.53	0	0	0	7.4	47.2	44.8	69.4	3.98	0	0
Acres-Feet	23	151	0	0	0	452	2,810	2,750	4,130	245	0	0

Year Mean 14.6
Acres-Feet 10,560

BEAR RIVER NEAR WOODRUFF, UTAH

Location. — Lat 41°31'25", long 111°01'00", in SW¹/₄ sec. 20, T. 18 N., R. 120 W., in Wyoming, on left bank 2.8 miles upstream from Wyoming-Utah State line and 7.6 miles east of Woodruff.

Drainage area. — 870 sq. mi, approximately.

Records available. — April 1942 to September 1958.

Gage. — Water-stage recorder. Altitude of gage is 6,360 ft (from river-profile map).

Average discharge. — 16 years, 215 cfs (155,700 acre-ft per year).

Extremes. — Maximum discharge during year, 1,460 cfs May 29 (gage height, 3.94 ft); no flow Aug. 21 to Sept. 30.

1942-58: Maximum discharge, 3,010 cfs Apr. 28, 1952 (gage height, 5.32 ft); maximum gage height 5.98 ft Mar. 21, 1951 (ice jam); no flow at times each year 1942-49, 1954-58.

Remarks. — Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 45,000 acres above station.

Bear River near Woodruff, Utah
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.1	56					111	192	830	49	0.2	
2	8.1	56					82	196	698	40	.2	
3	8.7	65					89	209	672	33	.2	
4	10	61					74	245	615	26	.2	
5	12	63			64		61	295	602	24	.2	
6	15	74					58	359	615	24	a .2	
7	19	59					46	455	731	22	a .2	
8	20	63				70	56	503	907	20	a .2	
9	20	65					63	444	824	19	a .2	
10	22	61	70				56	481	621	16	a .2	
11	20	58					52	560	465	14	a .2	
12	22	68					54	686	368	11	a .2	
13	22	72		60	66		59	790	316	9.2	a .2	
14	24	76					69	686	253	6.3	a .2	
15	26	74					101	653	206	6.3	a .2	
16	26				72		206	578	164	6.8	a .2	
17	30				75		320	520	149	5.1	a .2	
18	30				80	74	514	608	126	2.9	a .1	
19	32	65			85	78	660	777	106	2.1	a .1	
20	36				95	85	508	864	80	2.0	a .1	
21	41				100	92	429	1,020	67	2.5	0	
22	46				100	100	359	1,180	65	2.1	0	
23	47				100	115	295	1,280	56	1.8	0	
24	49				100	135	238	1,300	56	1.5	0	
25	49				95	130	227	1,370	59	1.5	0	
26	54		65		88	125	276	1,340	138	1.3	0	
27	54	70			80	120	295	1,360	152	1.2	0	
28	54			64	75	115	276	1,400	96	1.2	0	
29	58					115	242	1,390	70	.8	0	
30	58					115	227	1,240	54	.6	0	
31	52					113		1,100		.5	0	
	972.9	1,980	2,115	1,884	2,115	2,702	6,103	24,081	10,161	353.7	3.7	0
MEAN	31.4	66.0	68.2	60.8	75.5	87.2	203	777	339	11.4	0.12	0
ACRES-FOOT	1,930	3,930	4,200	3,740	4,200	5,360	12,110	47,760	20,150	702	7.3	0

a No gage height record.

Note.—Stage-discharge relation affected by ice Nov. 15 to MAR. 30.

Year or Period 1944
MEAN 104,100

BEAR RIVER BELOW PIXLEY DAM, NEAR COKEVILLE, WYOMING

Location. — Lat 41°56'20", long 110°59'05", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 25, T. 23 N., R. 120 W., 800 ft downstream from Pixley Dam, 17.5 miles downstream from Twin Creek and 11 miles south of Cokeville.

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

Records available. — October 1941 to November 1943, October 1952 to September 1956, 1958 (irrigation season). Published as "near Cokeville" 1941-43.

Gage. — Water-stage recorder. Altitude of gage is 6,185 ft (from river-profile map). Oct. 31, 1941 (corrected), to Nov. 30, 1943, at site 200 ft downstream at different datum.

Average discharge. — 5 years (1943, 1952-56), 129 cfs (93,390 acre-ft. per year).

Extremes. — 1941-43, 1952-56: Maximum daily discharge, 2,300 cfs Mar. 25, 1956; minimum, 4.6 cfs May 25, 1954.

Bear River below Pixley Dam near Cokeville, Wyoming
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									581	57	26	5.8
2									591	56	25	2.8
3									521	54	23	3.2
4									418	51	22	3.6
5									256	51	21	3.6
6									112	51	21	3.6
7									81	47	20	3.6
8									96	34	20	3.6
9									95	64	20	3.8
10									82	47	19	3.8
11									78	36	20	3.8
12									86	33	18	3.8
13									102	32	16	3.8
14									109	29	17	3.8
15									109	28	14	
16									103	27	8.6	
17									95	25	8.6	
18									83	40	9.4	
19									85	31	11	
20								72	82	26	12	
21								78	77	23	12	
22								87	74	23	13	
23								92	72	23	14	
24								100	71	24	14	
25								116	72	25	12	
26								212	70	24	12	
27								364	64	26	11	
28								356	60	23	72	
29								360	58	25	23	
30								382	59	27	16	
31								435		27	15	
									4,447	1,089	565.6	
MEAN									148	35.1	18.2	
ACRE- FEET									8,820	2,160	1,120	

MEAN _____ 66.3 _____

PERIOD _____ ACRE-FOOT _____ 12,100 _____

SMITHS FORK NEAR BORDER, WYOMING

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 12 miles northeast of Border.

Drainage area. — 165 sq mi.

Records available. — May 1942 to September 1958.

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. — 16 years, 199 cfs (144,100 acre-ft per year).

Extremes. — Maximum discharge during year, 1,150 cfs May 28 (gage height, 4.13 ft); minimum, 54 cfs Mar. 27, Apr. 6, but may have been less during periods of ice effect or no gage height record.

1942-1958: Maximum discharge, 1,500 cfs June 7, 1957 (gage height, 4.56 ft); minimum, 35 cfs Mar. 21, 1955 (result of freezeup), but may have been less during periods of no gage-height record.

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

Smiths Fork near Border, Wyoming
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	107	91	80				62	137	900	326	166	107	
2	107	86					66	874	161	105			
3	109	91					63	216	841	310	161	103	
4	113	89					65	268	816	302	161	103	
5	109	89	83			66	65	326	790	298	153	103	
6	107	89					62	390	822	287	147	101	
7	107	88	78				65	437	841	279	145	101	
8	105	88	64				462	835	272	142	99		
9	103	85	86	73	70		64	562	790	261	137	99	
10	103	82	64				599	716	254	137	99		
11	101	85	78				64	616	673	246	135	99	
12	101	88					64	650	650	239	133	107	
13	101	88					69	578	610	232	130	124	
14	101	89					73	599	572	229	128	107	
15	101	88	79				79	583	542	229	126	107	
16	99	86					88	605	532	222	126	105	
17	97	84	79				99	656	532	216	124	101	
18	97		80				126	734	527	209	126	99	
19	97	80	76				137	790	522	209	124	99	
20	97	78					66	130	829	508	209	121	97
21	97	80	76				66	140	906	494	206	117	97
22	97		76				66	140	978	476	196	119	97
23	96	80	76				66	124	972	462	193	121	96
24	96						66	109	1,010	458	190	119	96
25	96	80	76				68	109	1,040	437	190	117	96
26	94						68	103	1,080	411	190	115	94
27	94	80	76				64	103	1,110	386	184	115	94
28	94						68	99	1,110	374	175	117	94
29	93	80	76				66	105	1,040	357	172	117	94
30	93						66	115	1,010	341	190	111	94
31	91	80	76				65	958	178	107	107	107	
	3,103	2,558	2,427	2,263	1,960	2,047	2,716	21,412	18,089	7,207	4,058	3,017	

MEAN	100	85.3	78.3	73	70	66.0	90.5	691	603	232	131	101
ACRE-FT PER YEAR	6,150	5,070	4,810	4,490	3,890	4,060	5,390	42,470	35,880	14,290	8,050	5,980

Notes: Stage discharges relation affected by ice, Nov. 17 to Dec. 6, Dec. 10-15, Dec. 23 to Feb. 2. No gage-height record Feb. 3 to Mar. 18.

MEAN _____ 194
ACRE-FT PER YEAR _____ 140,500

BEAR RIVER AT BORDER, WYOMING

Location. — Lat 42°11', long 111°03', in NE $\frac{1}{4}$ NE $\frac{1}{4}$ 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 1937 to September 1958.

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

Average discharge. — 21 years, 410 cfs (296,800 acre-ft per year).

Extremes. — Maximum discharge during year, 1,520 cfs June 2 (gage height, 5.63 ft) ; minimum, 83 cfs Sept. 20.

1937-58: Maximum discharge, 3,680 cfs May 11, 1952 (gage height 8.89 ft) ; minimum daily, 30 cfs Aug. 18-22, 1940.

Remarks. — Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 124,000 acres above station.

Bear River at Border, Wyoming
Discharge, in cubic feet per second, water year October 1937 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	160	218	210	210	195	340	397	551	1,440	317	186	121
2	160	218	195	205	190	330	395	548	1,500	321	186	119
3	164	220	200	200	200	310	405	564	1,390	301	171	111
4	166	222	210	195	210		387	590	1,240	290	162	111
5	162	222	215	190	210		372	590	1,080	285	157	108
6	164	270	220	190	210		357	652	908	270	157	108
7	173	251	220	180	220		348	722	794	263	164	108
8	169	253	220	175	210	300	348	769	776	244	158	104
9	176	248	220	170	210		357	820	761	216	155	101
10	164	242	210	170	210		350	888	743	216	153	98
11	184	238	205	175	215		367	900	722	232	153	95
12	180	236	205	180	230		374	920	683	230	146	99
13	182	238	205	185	220	260	382	924	662	216	141	106
14	180	240	205	190	220	260	400	880	645	201	132	106
15	178	246	210	195	220	270	430	864	622	184	125	94
16	176	255	215		225	290	481	844	603	186	125	99
17	175	251	215		230	280	530	900	558	173	117	102
18	173	240	210		240	270	574	1,020	520	162	114	95
19	164	240	210	200	250	265	635	1,070	508	162	105	90
20	160	230	215		260	265	680	1,090	493	162	108	85
21	160	210	215		270	265	725	1,080	484	157	111	88
22	162	200	210		280	274	820	1,110	455	158	117	90
23	166	205	210		290	301	779	1,180	433	146	119	89
24	173	205	210	210	300	343	697	1,180	397	130	124	88
25	184	205	210	205	310	390	632	1,200	387	142	122	82
26	201	205	215	200	330	422	606	1,230	387	153	117	92
27	210	210	215	200	340	424	574	1,370	374	149	116	93
28	214	210	215	205	340	405	548	1,470	355	146	117	93
29	216	215	215	210		405	542	1,480	343	139	151	96
30	207	215	210			416	548	1,420	322	144	141	98
31	216		215	200		424		1,420		184		125

5,539 6,864 6,560 6,050 6,835 9,909 15,040 30,246 20,585 6,279 4,275 2,983

MEAN ANNUAL FLOW	179	229	212	195	244	320	501	976	686	203	138	99.4
Note: Stage-discharge relation affected by ice Nov. 18 to Mar. 21 (no gage-height record Nov. 22 to Dec. 10, Dec. 13-18, Dec. 26-YEAR to Jan. 17, Mar. 9-21)	10,990	13,610	13,010	12,000	13,560	19,650	29,830	59,990	40,830	12,450	8,480	5,920

MEAN _____ 332 _____
OR
ANNUAL PERIOD _____ 240,300 _____

BEAR RIVER BELOW STEWART DAM, NEAR MONTPELIER, IDAHO

Location. — Lat. 42°15'30", long 111°17'30", in NE1/4, sec. 34, T. 13 S., R. 44 E., on right bank 300 ft downstream from Stewart Dam and 4 1/2 miles south of Montpelier.

Records available. — October 1945 to September 1958 in reports of Geological Survey. January 1922 to September 1945 in files of Salt Lake City district office, Geological Survey.

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

Average discharge. — 36 years, 66.8 cfs (unadjusted), (48,360 acre-ft per year).

Extremes. — Maximum daily discharge during year, 31 cfs July 4; minimum daily, 6.2 cfs July 14.

1922-58: Maximum daily discharge, 3,050 cfs June 3, 1923; minimum daily, 0 cfs July 15, 1956.

Remarks. — Records good. Discharge measurements generally made once each week. Water diverted at Stewart Dam for storage and regulation in Bear Lake. Many diversions for irrigation above station.

Cooperation. — Records collected by Utah Power & Light Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project. One discharge measurement made by Geological Survey in addition to those made by the power company.

Bear River below Stewart Dam
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	20	20	8.9	9.4	13	16	14	25	27	21	17
2	20	21	20	8.9	9.4	13	15	14	25	28	22	16
3	20	20	20	8.9	9.4	14	14	14	26	29	22	16
4	20	20	19	7.3	9.4	13	14	15	26	31	22	15
5	20	20	19	7.0	9.4	14	13	15	24	30	22	12
6	21	20	19	7.3	9.4	14	13	15	23	30	23	12
7	21	20	20	7.3	9.4	14	13	15	23	20	20	11
8	21	21	20	7.3	8.9	13	13	16	24	9.8	14	10
9	21	21	20	7.0	8.9	14	13	15	25	8.5	16	9.8
10	20	21	20	7.0	8.9	14	13	15	25	7.7	20	8.9
11	20	22	20	7.3	9.4	14	13	16	25	7.3	20	8.9
12	20	22	20	8.5	10	14	13	16	24	6.6	20	8.5
13	19	22	20	8.5	10	13	13	17	25	6.6	19	8.5
14	20	22	20	8.9	10	13	13	18	24	6.2	19	8.1
15	20	22	20	8.9	11	14	13	18	25	6.6	18	8.5
16	19	22	20	8.9	11	13	14	17	27	8.1	18	9.4
17	19	22	20	9.4	11	13	15	17	27	18	18	9.4
18	19	22	20	8.5	13	13	16	20	26	18	17	9.8
19	19	21	20	8.5	14	14	17	26	26	17	17	9.8
20	19	22	20	8.5	15	13	17	26	28	17	17	9.8
21	19	21	20	9.4	13	14	17	26	29	17	17	11
22	19	20	21	9.4	13	14	17	26	28	18	18	13
23	19	20	20	9.4	15	9.8	16	24	28	19	18	16
24	19	20	20	9.4	16	13	16	25	29	20	17	15
25	19	19	20	9.4	17	15	16	25	29	20	17	15
26	19	19	16	9.4	13	10	15	24	29	20	16	15
27	19	20	11	9.4	15	9.4	14	24	29	20	16	15
28	19	20	10	8.9	13	8.5	14	25	29	20	16	15
29	20	20	10	8.9		15	14	27	29	21	17	15
30	20	20		9.4	9.4		15	14	26	21	17	15
31	20		9.4	9.4		15		26		21	18	

608 622 563.8 265.2 321.9 408.7 434 617 790 549.4 572 363.4

MAX	19.6	20.7	18.2	8.55	11.5	13.2	14.5	19.9	26.3	17.7	18.5	12.1
ACRE-FT	1,210	1,230	1,120	526	638	811	861	1,226	1,570	1,098	1,130	721

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YEAR OR PERIOD MEAN 16.7
ACRE-FOOT 12,130

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 800 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 1958.

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, 3,820 cfs Apr. 23, 24 (gage height, 4.78 ft); minimum daily discharge, 20 cfs June 14, 21, Aug. 5.

1889-1958: Maximum discharge observed, 11,600 cfs June 7-10, 1909 (gage height, 7.70 ft., site and datum then in use); 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.—Ten discharge measurements furnished by Utah Power & Light Co.

Bear River near Collinston, Utah
Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	870	1,330	1,440	218	1,270	1,850	2,110	2,590	1,280	22	560	327
2	1,020	1,380	1,460	971	1,180	1,640	2,100	2,750	1,080	21	411	448
3	1,240	1,290	1,170	921	1,080	1,270	2,520	2,830	751	22	226	499
4	1,590	1,240	1,280	777	1,140	1,670	2,110	2,580	743	22	580	495
5	1,650	1,282	1,270	581	1,160	1,450	2,170	2,360	1,010	22	20	455
6	1,580	1,180	1,300	923	1,550	1,410	2,260	2,320	836	22	21	501
7	1,530	1,310	1,040	1,000	1,800	1,490	2,050	2,190	698	22	22	456
8	1,470	1,200	1,300	974	1,480	1,490	1,890	2,310	739	22	22	466
9	1,280	1,350	1,340	911	1,380	1,060	1,970	2,370	413	22	893	414
10	1,240	1,480	1,320	911	1,460	1,360	2,030	2,300	387	24	871	386
11	1,520	1,380	1,300	1,040	1,440	1,280	1,930	2,150	68	24	758	344
12	1,370	1,240	940	853	1,390	1,390	1,820	2,400	25	26	603	434
13	1,310	1,460	1,110	1,040	1,600	1,430	1,760	2,360	22	26	224	165
14	1,500	1,540	907	1,100	1,580	1,460	1,890	2,820	20	25	519	309
15	875	1,610	898	1,360	1,550	1,420	1,300	2,730	22	24	452	752
16	1,160	1,790	1,320	1,370	1,570	976	1,940	2,530	22	24	698	703
17	1,340	1,650	1,080	1,440	1,520	1,380	1,980	2,320	22	25	505	678
18	1,480	1,470	1,430	1,530	2,360	1,450	3,110	2,140	22	24	347	700
19	1,200	1,370	1,300	1,440	3,020	1,570	3,510	1,850	22	22	22	700
20	1,220	1,540	1,230	1,620	2,610	1,690	3,580	2,120	21	24	22	635
21	1,340	1,390	1,370	1,680	2,580	1,770	3,680	1,880	20	25	22	625
22	1,230	1,230	1,190	1,450	2,340	1,990	3,720	1,980	21	25	42	527
23	1,210	1,180	1,330	1,610	2,840	1,620	3,810	2,560	22	25	272	560
24	1,300	1,250	826	1,640	2,590	1,530	3,790	2,370	22	25	518	644
25	1,220	1,310	894	1,510	2,220	2,100	3,800	2,090	24	25	602	771
26	1,140	1,410	1,250	1,370	2,140	2,020	3,800	1,810	22	25	619	683
27	1,190	1,330	1,320	1,360	2,300	2,140	3,630	2,080	22	25	618	849
28	1,090	1,040	1,290	1,520	2,150	2,060	3,510	2,190	22	28	23	789
29	1,240	1,290	1,120	1,440		2,000	2,920	1,630	22	291	290	873
30	1,250	1,410	1,290	1,600		1,950	2,990	1,180	22	345	351	656
31	1,400		1,250	1,380		2,120		831		545		447
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	40,055	40,930	37,535	37,540	51,300	49,736	80,610	68,621	8,422	2,109	11,580	16,852

Month	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	1,292	1,364	1,211	1,211	1,832	1,604	2,687	2,214	281	68.0	374	562
Accum. Flow	79,450	81,180	74,450	74,460	101,800	98,650	159,900	136,100	16,700	4,180	22,970	33,430

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Year 1958
Accum. Flow 882,300