TWENTY-EIGHTH ANNUAL REPORT

YELLOWSTONE RIVER

COMPACT COMMISSION

1979

YELLOWSTONE RIVER COMPACT COMMISSION

428 Federal Building
Helena, Montana

Honorable Ed Herschler
Governor of the State of Wyoming
Cheyenne, Wyoming

Honorable Thomas L. Judge
Governor of the State of Montana
Helena, Montana

Honorable Arthur A. Link
Governor of the State of North Dakota
Bismarck, North Dakota

Sirs:

Pursuant to Article III of the Yellowstone River Compact, the Commission submits the following twenty-eighth annual report of activities for the period ending September 30, 1979.

The Commission held a special meeting at Billings, Montana, on July 3, 1979. Mr. George L. Christopulos, Wyoming State Engineer, Mr. Gary Fritz, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation, the designated representatives of their respective states, and Mr. Walter R. Scott, the designated Federal representative and chairman, were all present.

Others present were:

William Long, Deputy Wyoming State Engineer, Cheyenne, Wyoming,
Clem Lord, Interstate Streams Engineer, State Engineer's Office, Cheyenne, Wyoming,
Lou Allen, State Engineer's Office, Cheyenne, Wyoming,
Paul Kawulok, Wyoming Board of Control, Sheridan, Wyoming,
Tom King, Division Superintendent, State Engineer's Office, Riverton, Wyoming,
Jack D. Palma, Deputy Attorney General, State of Wyoming, Cheyenne, Wyoming,
Michael Dwyer, Legal Counsel, State Water Commission, Bismarck, North Dakota,

Rick Bondy, Department of Natural Resources and Conservation, Helena, Montana,
Richard Moy, Department of Natural Resources and Conservation, Helena, Montana,
Donald D. MacIntyre, Chief Legal Counsel, Department of Natural Resources and Conservation, Helena, Montana,
George M. Pike, U.S. Geological Survey, Helena, Montana,
L. Grady Moore, U.S. Geological Survey, Bismarck, North Dakota,
Michelle F. Johnston, U.S. Geological Survey, Compact Stenographer, Helena, Montana

This special meeting was called to discuss the Compact Administration Subcommittee meeting and give the subcommittee direction. Gary Fritz was introduced as the new Administrator of the Montana Department of Natural Resources and Conservation, Water Resources Division, replacing Orrin Ferris. Walter R. Scott announced his resignation as chairman of the Commission.

A special meeting of the Compact Administration Subcommittee was held at Sheridan, Wyoming, on September 11, 1979. Those present were:

L. Grady Moore, acting Federal representative and chairman, Yellowstone Compact Commission,
Rick Bondy, Department of Natural Resources and Conservation, Helena, Montana,
Richard Moy, Department of Natural Resources and Conservation, Helena, Montana,
Clem Lord, Interstate Streams Engineer, State Engineer's Office, Cheyenne, Wyoming,
Lou Allen, State Engineer's Office, Cheyenne, Wyoming,
Paul Kawulok, Wyoming Board of Control, Sheridan, Wyoming

The Commission held the annual meeting at Casper, Wyoming, on November 14, 1979. Mr. George L. Christopulos, Wyoming State Engineer, Mr. Gary Fritz, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation, the designated representatives of their respective states, and Mr. L. Grady Moore, the designated Federal representative and chairman, were all present.

Others present were:

Clem Lord, Interstate Streams Engineer, State Engineer's Office, Cheyenne, Wyoming,
Lou Allen, State Engineer's Office, Cheyenne, Wyoming,
Paul Kawulok, Wyoming Board of Control, Sheridan, Wyoming,
Rick Oliver, State Engineer's Office, Sheridan, Wyoming,
Rick Bondy, Department of Natural Resources and Conservation, Helena, Montana,
Richard Moy, Department of Natural Resources and Conservation, Helena, Montana,
George M. Pike, U.S. Geological Survey, Helena, Montana,
Michelle F. Johnston, U.S. Geological Survey, Compact Stenographer, Helena, Montana

There were no incidents during the year that required administration of the water in accordance with the provisions of the Compact. At the present level of water-resources development, the Commission feels that a program of intensive water-use regulations is not necessary. However, the attention of the Commission is continuing to focus on the need to define the detailed procedures for implementing Compact provisions previous to the time when development of water within the Yellowstone River Basin requires that these provisions be enforced.

The interest in Yellowstone River water for coal development and peripheral needs has continued to increase and it is evident that, at some yet undetermined time, it will be necessary to divide the waters of the Yellowstone River System as allocated by Article V of the Compact.

The documentation of pre-1950 water rights has been completed in Wyoming. The 1973 Montana Water Use Act is assisting that State in its documentation, although it is still incomplete.

A problem that continues to be of major long-range concern to the Commission is the lack of proper quantification of all existing water rights. Of particular concern are the water rights of the Indian tribes and the implied Federal reserved rights. The Commission believes that studies and action necessary to quantify these rights should be expedited.

The Commission feels that due to the potential for large-scale use of water associated with coal development, joint allocation and development studies should be carried out in the near future. To accomplish this in a timely manner, the Commission recommends a proposal be submitted to the Old West Regional Commission for the support of two full-time individuals, one in Wyoming and one in Montana. These individuals would be additional staff and would have a two year work assignment.

The budgets for fiscal years 1979 through 1981 are discussed in the following general report. The amount of funds required for future Commission activities will depend largely on the outcome of water-development plans, inflation, and the degree of water administration required.

Respectfully submitted,

George L. Christopulos
Commissioner for Wyoming

Gary Fritz
Commissioner for Montana

L. Grady Moore
Federal Representative

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ILLUSTRATION

GENERAL REPORT

Cost:

The work funded by the Commission, which to date has been primarily concerned with the collection of required hydrologic data, has been financed through cooperative arrangements whereby Montana and Wyoming each bear one-fourth of the cost and the remaining one-half is borne by the United States. The salaries and necessary expenses of the State and Federal representatives, and hydrologic data made available by other agencies, are not evaluated or considered as expenses of the Commission.

The expense of the Commission during Fiscal Year 1979 was $23,880, in accordance with the budget adopted for the year.

The budgets for Fiscal Years 1980 and 1981 were tentatively adopted subject to the availability of appropriations.

The budgets for the three fiscal years are summarized as follows:

October 1, 1978, to September 30, 1979 (Fiscal Year 1979):	
Continuation of existing stream-gaging programs	$23,880
October 1, 1979, to September 30, 1980 (Fiscal Year 1980):	
Continuation of existing stream-gaging program	22,080
October 1, 1980, to September 30, 1981 (Fiscal Year 1981):	
Estimate for continuation of existing stream-gaging program	24,280

Gaging Stations:

Gaging stations at the measuring sites specified in the Compact were continued in operation and satisfactory discharge records collected at each. In addition, it was determined that the station on Prairie Dog Creek near the Montana-Wyoming State line was not needed for Compact administration purposes. The station, was therefore, discontinued. Locations of gaging and reservoir stations are shown on a map of the Yellowstone River Basin at the end of the report.

During the water year ending September 30, 1979, annual streamflow was below average in three of the four tributaries of the Yellowstone River as given in the following table:

Measurement Point	Percent of Average
Clarks Fork Yellowstone River near Silesia, MT	84
Bighorn River at Bighorn minus Little Bighorn River near Hardin, MT Adjusted for change in contents in Bighorn Lake	101
Tongue River at Miles City, MT	89
Powder River at Locate, MT	69

Details of streamflow for Water Year 1979 and bar graphs showing comparisons with average flows during selected base periods and with the preceding year are given in appendix C.

Diversions:

There were no incidents during the year that required administration of the water in accordance with the provisions of the Compact. At the present level of water-resources development, the Commission feels that a program of intensive water-use regulations is not necessary.

Storage:

In reservoirs completed after January 1, 1950

Bighorn Lake, a Water and Power Resources Service project on the Bighorn River, and the largest storage project in the basin, contained 1,042,000 acre-feet at the beginning of the year and 977,300 acre-feet at the close. It fluctuated from a minimum of 831,200 acre-feet on March 8, 1979, to a maximum of 1,072,000 acre-feet on June 29, 1979. Boysen Reservoir, located on the Wind River and operated by the Water and Power Resources Service, began the year with 681,600 acre-feet in storage and ended with 567,900 acre-feet. Details regarding these reservoirs are given in appendix E. The Commission is cognizant of other reservoirs in this general group and considers their aggregate effect to be insufficient to warrant the collection of storage data at this time.

In reservoirs existing on January 1, 1950

As a matter of record and general information, month-end storage data are given in appendix F for reservoirs in existence above the points of measurement on January 1, 1950. These data are pertinent to allocation under Article V, Section C, Item 5 of the Compact.

RULES AND REGULATIONS FOR ADMINISTRATION OF THE YELLOWSTONE RIVER COMPACT

A compact, known as the Yellowstone River Compact, between the States of Wyoming, Montana, and North Dakota, having become effective on October 30, 1951, upon approval of the Congress of the United States, which apportions the waters of certain interstate tributaries of the Yellowstone River which are available after the appropriative rights existing in the States of Wyoming and Montana on January 1, 1950, are supplied, and after appropriative rights to the use of necessary supplemental water are also supplied as specified in the Compact, the following rules and regulations are adopted subject to the provisions for amendment revision or abrogation as provided herein.

Article I. Collection of Water Records

A. It shall be the joint and equal responsibility of the members of the States of Wyoming and Montana to collect, cause to be collected, or otherwise furnish records of tributary streamflow at the points of measurement specified in Article V (B) of the Compact, or as near thereto as is physically or economically feasible or justified.

1. Clarks Fork

   The gaging station known as Clarks Fork near Silesia, Montana and located in NW1/4 SE1/4 sec.1, T.4 S., R.23 E., shall be the point of measurement for the Clarks Fork.

2. Bighorn River (exclusive of Little Bighorn River)

   The gaging station known as the Bighorn River at Bighorn, Montana, and located in NE1/4 NE1/4 sec.33, T.5 N., R.34 E., shall temporarily be the designated point of measurement on that stream. The flow of the Little Bighorn River as measured at the gaging station near Hardin, Montana, and located in SW1/4 NW1/4 sec.20, T.1 S., R.34 E., shall be considered the point of measurement for that stream, except that if or when satisfactory records are not available, the records for the nearest upstream station with practical corrections for intervening inflow or diversion shall be used.

3. Tongue River

The gaging station known as the Tongue River at Miles City, Montana, and located in SE1/4 sec.23, T.7 N., R.47 E., shall temporarily be the point of measurement for that stream.

4. Powder River

The gaging station known as the Powder River at Locate, Montana, and located in SE1/4 sec.23, T.8 N., R.51 E., shall temporarily be the designated point of measurement for that stream.

B. Records of total annual diversion in acre-feet above the points of measurement designated in the Compact for irrigation, municipal, and industrial uses developed after January 1, 1950, shall be furnished by the members of the Commission for their respective States, at such time as the Commission deems necessary for interstate administration as provided by the terms of the Compact. Providing that if it be acceptable to the Commission, reasonable estimates thereof may be substituted.

C. Annual records of the net change in storage in all reservoirs, not excluded under Article V (E) of the Compact, above the point of measurement specified in the Compact and completed after January 1, 1950, and the annual net change in reservoirs existing prior to January 1, 1950, which is used for irrigation, municipal, and industrial purposes developed after January 1, 1950, shall be the primary responsibility of the member of the Commission in whose State such works are located; providing such data are not furnished by Federal agencies under the provisions of Article III (D) of the Compact, or collected by the Commission.

Article II. Office and Officers

A. The office of the Commission shall be located, and be that of the United States Geological Survey, in Helena, Montana.

B. The Chairman of the Commission shall be the Federal representative as provided in the Compact.

C. The Secretary of the Commission shall be as provided for in Article III of these rules.

D. The credentials of each member of the Commission shall be placed on file in the office of the Commission.

Article III. Secretary

A. The Commission, subject to the approval of the Director of the United States Geological Survey, shall enter into cooperative agreements with the U.S. Geological Survey for such engineering and clerical services as may reasonably be necessary for the administration of the Compact. Said agreements shall provide that the Geological Survey shall:

1. Maintain and operate gaging stations at or near the points of measurement specified in Article V (A) of the Compact.

2. Assemble factual information on stream flow, diversion and reservoir storage for the preparation of an annual report to the Governors of the signatory States.

3. Make such investigations and reports as may be requested by the Commission in aid of its administration of the Compact.

B. Act as Secretary to the Commission.

Article IV. Budget

A. At the annual meeting of each even numbered year or prior thereto, the Commission shall adopt a budget for operation during the ensuing biennium beginning July first. Such budget shall set forth the total cost of construction, maintenance and operation of gaging stations, the cost of engineering and clerical aid, and other necessary expenses excepting the salaries and personal expenses of the Commissioners. On odd-numbered years revisions of the budget shall be considered.

B. It shall be the obligation of the Commissioners of the States of Montana and Wyoming to endeavor to secure from the Legislature of their respective States sufficient funds with which to meet the obligations of this Compact, except insofar as provided by the Federal government.

Article V. Meetings

An annual meeting of the Commission shall be held each November at some mutually agreeable point in the Yellowstone River Basin for consideration of the annual report for the water year ending the preceding September 30th, and for the transaction of such other business consistent with its authority; provided that by unanimous consent of the Commission the

date and place of the annual meeting may be changed. Other meetings as may be deemed necessary shall be held at a time and place set by mutual agreement, for the transaction of any business consistent with its authority.

No action of the Commission shall be effective until approval by the Commissioners for the States of Wyoming and Montana.

Article VI. Amendments, Revisions and Abrogations.

The Rules and Regulations of the Commission may be amended or revised by a unanimous vote at any meeting of the Commission.

Douglas G. Smith
Commissioner for Montana

Floyd A. Bishop
Commissioner for Wyoming

ATTESTED:

Robert C. Williams
Federal Representative

Adopted November 17, 1953
Amended November 9, 1970

METRIC CONVERSION TABLE

The following factors may be used to convert the inch-pound units published herein to the International System (SI) of metric units. Subsequent reports will contain both the inch-pound and SI unit equivalents in the station manuscript descriptions until such time that all data will be published in SI units.

Multiply inch-pound units	By	To obtain SI units
	Length	
feet (ft)	.3048	meters (m)
miles (mi)	1.609	kilometers (km)
	Area	
acres	4047	square meters (m^2)
	.4047	*hectares (ha)
	.4047	square hectometer (hm^2)
	.004047	square kilometers (km^2)
square miles (mi^2)	2.590	square kilometers (km^2)
	Volume	
cfs-day (ft^3/s-day)	2447	cubic meters (m^3)
	.002447	cubic hectometers (hm^3)
acre-feet (acre-ft)	1233	cubic meters (m^3)
	.001233	cubic hectometers (hm^3)
	.000001233	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	28.32	liters per second (L/s)
	28.32	cubic decimeters per second (dm^3/s)
	.02832	cubic meters per second (m^3/s)

*The unit hectare is approved for use with the International System (SI) for a limited time. See NBS Special Bulletin 330, p. 15, 1972 edition.

MONTHLY SUMMARY OF DISCHARGE FOR COMPACT STREAM-GAGING STATIONS

06208800 CLARKS FORK YELLOWSTONE RIVER NEAR SILESIA, MT

LOCATION.--Lat 45°30'48", long 108°49'42", in NW1/4 SE1/4 sec.1, T.4 S., R.23 E., Carbon County, Hydrologic Unit 10070006, on left bank 0.5 mi (0.8 km) downstream from Whitehorse Canal intake, 1 mi (2 km) upstream from Rock Creek, 3 mi (5 km) south of Silesia, and at mile 19 (31 km).

DRAINAGE AREA.--2,093 mi^2 (5,421 km^2).

PERIOD OF RECORD.--October 1969 to current year. Records for July 1921 to September 1969 (published as Clarks Fork Yellowstone River at Edgar) at site 5 mi (8 km) upstream not equivalent owing to diversion in Whitehorse Canal during irrigation season. Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Datum of gage is 3,405.79 ft (1,038.085 m), National Geodetic Vertical Datum of 1929 (levels by Army Corps of Engineers).

REMARKS.--Records good except those for winter period, which are poor. Diversion for irrigation of about 42,600 acres (172 km^2) of which 1,100 acres (4.45 km^2) lie below station. In addition, about 9,000 acres (36.4 km^2) of land above station are irrigated by diversions from the adjoining Rock Creek basin.

AVERAGE DISCHARGE.--10 years, 1,209 ft^3/s (34.24 m^3/s), 875,900 acre-ft/yr (1.08 km^3/yr).

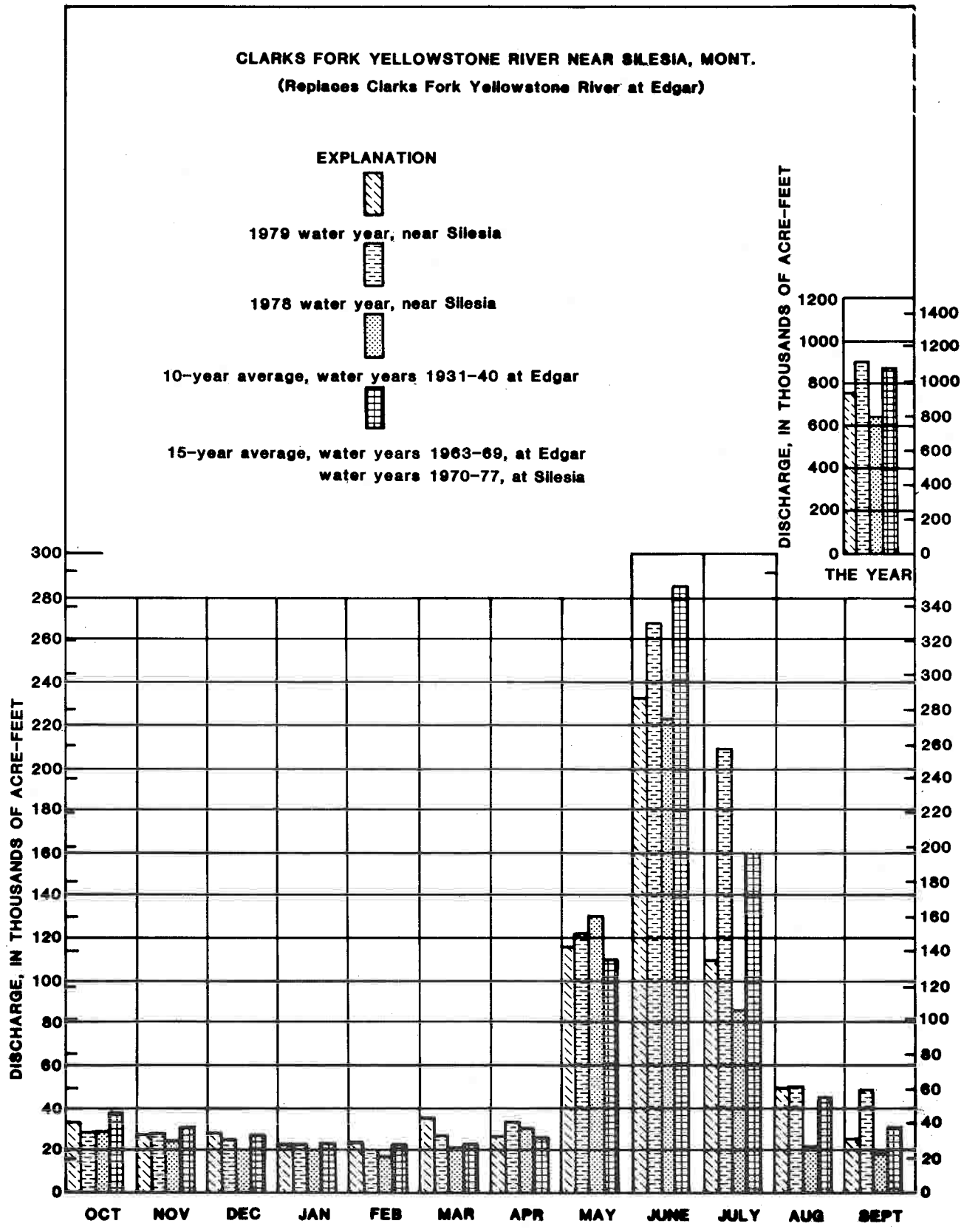
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,800 ft^3/s (334 m^3/s) June 10, 1972, gage height, 7.51 ft (2.289 m); maximum gage height, 7.82 ft (2.384 m) July 6, 1975; minimum discharge, 88 ft^3/s (2.36 m^3/s) July 21, 1977, gage height, 0.72 ft (0.219 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,300 ft^3/s (150 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
May 28	1600	6,380	181	5.79	1.765
June 7	0900	5,690	161	5.47	1.667
June 15	1300	*7,440	211	*6.25	1.905

Minimum daily discharge, 280 ft^3/s (7.93 m^3/s) Dec. 31.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1978	17,737	572	768	455	35,180
November	14,665	489	620	340	29,090
December	15,640	505	580	280	31,020
January 1979	11,500	371	440	300	22,810
February	13,110	468	560	340	26,000
March	18,287	590	900	427	36,270
April	15,189	506	673	388	30,130
May	59,700	1,926	5,980	503	118,400
June	117,240	3,908	7,080	1,770	232,500
July	55,345	1,785	4,340	874	109,800
August	25,765	831	1,380	453	51,100
September 1979	13,461	449	739	330	26,700
1979 water year	377,639	1,035	7,080	280	749,000



Comparison of discharge during 1979 water year with 1978 water year near Silesia and with average discharge for water years 1931-40 and 1963-69 at Edgar and for water years 1970-77 at Silesia.

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MT

LOCATION.--Lat 45°44'10", long 107°33'24", in NW1/4 SW1/4 NW1/4 sec.20, T.1 S., R.34 E., Big Horn County, Hydrologic Unit 10080016, downstream from bridge on Sarpy Road, 0.2 mi (0.3 km) upstream from terminal wasteway of Agency Canal, 0.6 mi (1.0 km) upstream from mouth, and 2.3 mi (3.7 km) east of Hardin.

DRAINAGE AREA.--1,294 mi^2 (3,351 km^2).

PERIOD OF RECORD.--June 1953 to current year. Records since June 1953 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Nonrecording gage. Datum of gage is 2,891.64 ft (881.372 m) National Geodetic Vertical Datum of 1929 (levels by Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi (0.6 km) downstream. Oct. 7, 1953, to May 6, 1963, water-stage recorder at site 0.3 mi (0.5 km) downstream. May 6, 1963, to Nov. 6, 1963, nonrecording gage at site 0.4 mi (0.6 km) downstream. All at different datums. Nov. 7, 1963, to Aug. 15, 1976, water-stage recorder at site 35 ft (11 m) downstream at present datum. Aug. 15, 1976, to Sept. 30, 1978, water-stage recorders located on each bank downstream of Sarpy Road bridge and were used depending on control conditions. The left-bank gage is given in the "LOCATION" paragraph. The right-bank gage location was lat 45°44'10", long 107°33'25", in SW1/4 NW1/4 NW1/4 sec. 20, T.1 S., R.34 E., at approximately the same datum. Oct. 1, 1978, to Sept. 30, 1979, nonrecording gage on Sarpy Road bridge.

REMARKS.--Records fair except those for winter periods, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft, 28.4 hm^3). Diversions for irrigation of about 17,000 acres (68.8 km^2) above station. Figures of discharge given herein include flow of terminal wasteway of Agency Canal.

AVERAGE DISCHARGE.--26 years, 326 ft^3/s (9.232 m^3/s), 236,200 acre-ft/yr (291 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s (640 m^3/s), revised, May 19, 1978, gage height, 11.20 ft (3.414 m), used gage height as obtained at bridge on Sarpy Road; maximum gage height, 11.78 ft (3.591 m) Mar. 20, 1960, site and datum then in use (backwater from ice); minimum discharge observed, 0.20 ft^3/s (0.006 m^3/s) Aug. 7, 1961, result of discharge measurement.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,900 ft^3/s (53.8 m^3/s) Mar. 16; minimum observed, 73 ft^3/s (2.07 m^3/s) Sept. 12.

REVISIONS.--Monthly summary figures published in the 1978 Yellowstone River Compact Commission report are superseded by those figures published in appendix D.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1978	8,564	276	295	257	16,990
November	7,436	248	351	170	14,750
December	6,910	223	310	120	13,710
January 1979	5,635	182	250	120	11,180
February	5,795	207	270	130	11,490
March	25,535	824	1,900	260	50,650
April	17,885	596	805	453	35,470
May	18,354	592	1,220	363	36,410
June	19,346	645	1,020	343	38,370
July	5,136	166	300	97	10,190
August	3,962	128	169	103	7,860
September 1979	3,129	104	127	86	6,210
1979 water year	127,687	350	1,900	86	253,300

06294700 BIGHORN RIVER AT BIGHORN, MT

LOCATION.--Lat 46°08'50", long 107°28'00", in NE1/4 NE1/4 sec.33, T.5 N., R.34 E., Treasure County, Hydrologic Unit 10080015, on right bank just downstream from bridge on old U.S. Highway 10, 0.3 mi (0.5 km) downstream from bridge on Interstate Highway 94, 0.7 mi (1.1 km) upstream from mouth, 1.3 mi (2.1 km) southwest of Bighorn, and 4.4 mi (7.1 km) east of Custer.

DRAINAGE AREA.--22,885 mi^2 (59,272 km^2). Area at site used prior to Oct. 7, 1955, 22,410 mi^2 (59,042 km^2).

PERIOD OF RECORD.--May 1945 to current year. Published as "near Custer", 1945-55. Records since January 1950 available in annual reports of the Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Altitude of gage is 2,690 ft (820 m), by barometer. May 11 to Dec. 6, 1945, nonrecording gage, and Dec. 7, 1945, to Oct. 6, 1955, water-stage recorder, at site 4 mi (6 km) upstream at different datum.

REMARKS.--Records fair except those for winter period, which are poor. Flow regulated by Bighorn Lake beginning November 1965 (usable capacity, 1,356,000 acre-ft, 1.67 km^3). Major regulation prior to November 1965 by 14 reservoirs in Wyoming and 1 in Montana with combined usable capacity of about 1,400,000 acre-ft (1.73 km^3), see appendixes E and F. Diversions for irrigation of about 465,000 acres (1,880 km^2) above station.

AVERAGE DISCHARGE.--34 years, 3,975 ft^3/s (112.6 m^3/s) 2,876,000 acre-ft/yr (3.55 km^3/yr), unadjusted.

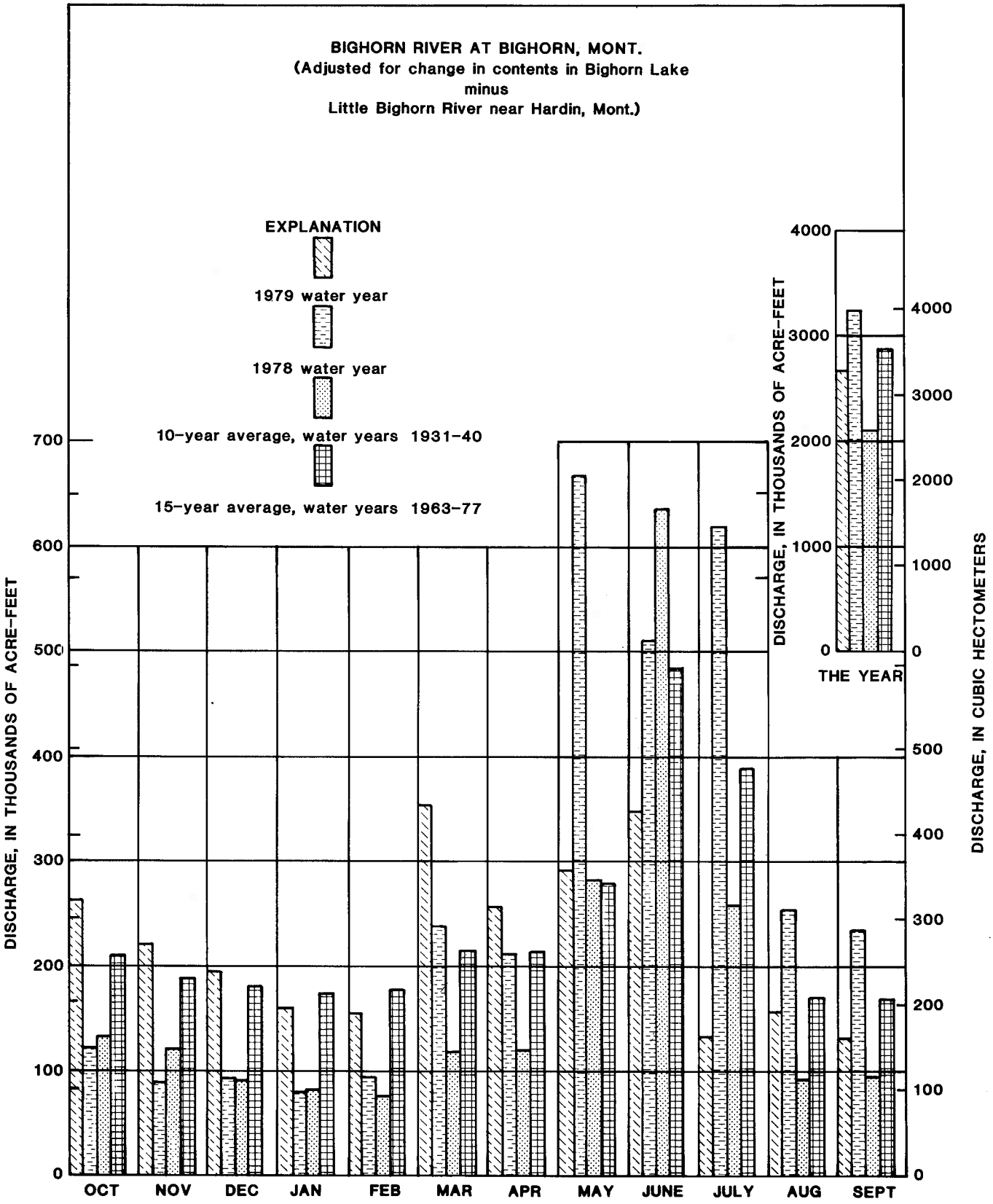
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,000 ft^3/s (1,610 m^3/s) May 20, 1978, gage height, 14.00 ft (4.267 m); maximum gage height recorded, 14.21 ft (4.331 m) Apr. 2, 1965 (ice jam); minimum discharge, about 275 ft^3/s (7.79 m^3/s) Nov. 15, 1959, result of freezeup; minimum daily, 400 ft^3/s (11.3 m^3/s) Apr. 4, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,180 ft^3/s (260 m^3/s) Mar. 14, gage height, 5.44 ft (1.658 m); maximum gage height, about 10.10 ft (3.079 m) Mar. 13 (backwater from ice jam); minimum daily discharge, 1,020 ft^3/s (28.9 m^3/s) Nov. 12, 13.

REVISIONS.--Monthly summary figures published in 1978 Yellowstone River Compact Commission report are superseded by those figures published in appendix D.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet	Adjusted runoff, in acre-feet*
Oct. 1978	135,330	4,365	4,660	2,050	268,400	268,400
Nov.	134,810	4,494	5,640	1,020	267,400	230,400
Dec.	143,960	4,644	4,900	3,600	285,500	211,200
Jan. 1979	113,200	3,652	4,000	3,300	224,500	181,300
Feb.	116,400	4,157	4,600	3,600	230,900	179,900
Mar.	175,750	5,669	8,430	4,300	348,600	396,400
Apr.	136,990	4,566	4,880	4,240	271,700	290,200
May	134,290	4,332	6,010	3,280	266,400	326,300
June	142,750	4,758	6,150	3,320	283,100	386,400
July	111,590	3,600	4,970	3,100	221,300	145,000
Aug.	94,950	3,063	3,660	2,350	188,300	172,800
Sept. 1979	67,300	2,243	2,370	2,100	133,500	133,600
1979 water year	1,507,320	4,130	8,430	1,020	2,990,000	2,924,900

* Adjusted for change in contents in Bighorn Lake.



Comparison of discharge for 1979 water year with 1978 water year and with average discharge for water years 1931-40 and 1963-77.

06306250 PRAIRIE DOG CREEK NEAR ACME, WY

LOCATION.--Lat 44°59'02", long 106°50'21", in NE1/4 SW1/4 SW1/4 sec.23, T.58 N., R.83 W., Sheridan County, Hydrologic Unit 10090101, on right bank, 600 ft (183 m) upstream from county bridge, 0.9 mi (1.5 km) upstream from mouth, 2.8 mi (4.5 km) downstream from Coutant Creek, and 7.6 mi (12.2 km) northeast of Acme.

DRAINAGE AREA.--358 mi^2 (927 km^2).

PERIOD OF RECORD.--October 1970 to September 1979 (discontinued). Records for May 1965 to September 1970 in files of Office of Wyoming State Engineer. Records since October 1970 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Altitude of gage is 3,450 ft (1,052 m), from topographic map.

REMARKS.--Records good except those for winter period, which are poor. Diversions above stations for irrigation of about 13,600 acres (55.0 km^2) of which about 60 acres (243,000 m^2) lies below station. Flow supplemented by three transbasin diversions from North Piney Creek and South Piney Creek via Prairie Dog ditch, Piney and Cruse ditches and Mead-Coffeen ditch.

AVERAGE DISCHARGE.--9 years, 46.2 ft^3/s (1.308 m^3/s), 33,470 acre-ft/yr (41.3 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,940 ft^3/s (112 m^3/s) May 19, 1978, gage height, 12.60 ft (3.840 m), from rating curve extended above 662 ft^3/s (18.7 m^3/s) on basis of slope-area measurement of peak flow; minimum daily, 6.3 ft^3/s (0.178 m^3/s) June 4, 5, 1976.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 265 ft^3/s (7.50 m^3/s) Mar. 17, gage height, 3.85 ft (1.173 m); minimum daily, 14 ft^3/s (0.40 m^3/s) July 24, Aug. 9.

REVISIONS.--Monthly summary figures published in the 1978 Yellowstone River Compact Commission report are superseded by those figures published in appendix D.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1978	1,233	39.8	44	33	2,450
November	1,142	38.1	56	30	2,270
December	768	24.8	32	15	1,520
January 1979	586	18.9	24	16	1,160
February	658	23.5	29	19	1,310
March	3,193	103	249	21	6,330
April	2,130	71.0	101	51	4,220
May	1,467	47.3	76	39	2,910
June	1,098	36.6	79	28	2,180
July	847	27.3	66	14	1,680
August	1,135	36.6	58	14	2,250
September 1979	1,346	44.9	54	37	2,670
1979 water year	15,603	42.7	249	14	30,950

06308500 TONGUE RIVER AT MILES CITY, MT

LOCATION.--Lat 46°20'44", long 105°48'10", in SE1/4 sec.23, T.7 N., R.47 E., Custer County, Hydrologic Unit 10090102, on right bank 4 mi (6 km) south of Miles City and 8 mi (13 km) upstream from mouth.

DRAINAGE AREA.--5,379 mi^2 (13,932 km^2).

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. Monthly discharges only for some periods, published in WSP 1309. Records since January 1950 available in annual reports of Yellowstone Compact Commission.

GAGE.--Water-stage recorder. Datum of gage is 2,375.76 ft (724.132 m), National Geodetic Vertical Datum of 1929 (levels by Army Corps of Engineers). April 1938 to April 1942, nonrecording gage at site 8 mi (13 km) upstream at different datum. April 1946 to Sept. 30, 1963, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Water-discharge records good except those for winter period, which are poor. Flow regulation by Tongue River Reservoir (appendix F) only, and many small reservoirs in Wyoming (combined capacity, about 15,000 acre-ft, 18.5 hm^3). Diversions for irrigation of about 90,000 acres (364 km^2) above station.

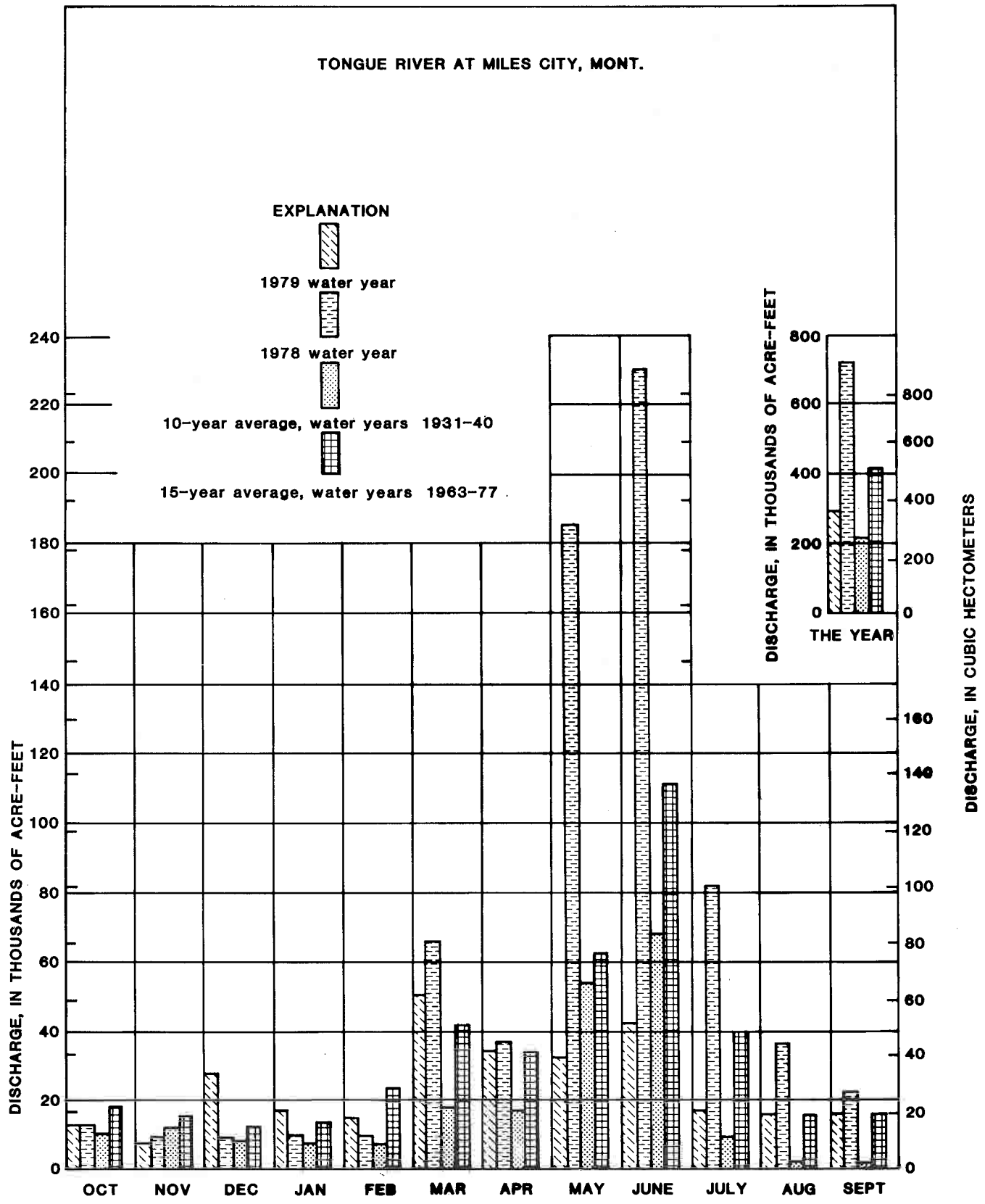
AVERAGE DISCHARGE.--36 years (1938-41, 1946-79), 454 ft^3/s (12.86 m^3/s), 328,900 acre-ft/yr (406 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft^3/s (337 m^3/s) June 15, 1962, gage height, 12.33 ft (3.758 m), present datum, from rating curve extended above 5,200 ft^3/s (147 m^3/s) on basis of float measurement; maximum gage height, 13.27 ft (4.045 m), present datum, Mar. 19, 1960, Feb. 15, 1971 (ice jam); no flow July 9-19, Aug. 13, 14, Sept. 28, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 3,700 ft^3/s (105 m^3/s) Mar. 17, maximum gage height, 8.58 ft (2.615 m); Mar. 15 (ice jam); minimum daily discharge, 105 ft^3/s (2.97 m^3/s) Nov. 21 (result of freezeup).

REVISIONS.--Monthly summary figures published in the 1978 Yellowstone River Compact Commission report are superseded by those figures published in appendix D.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1978	7,861	254	342	184	15,590
November	4,509	150	210	105	8,940
December	11,990	387	490	260	23,780
January 1979	9,360	302	350	260	18,570
February	7,540	269	310	250	14,960
March	25,521	823	2,700	250	50,620
April	17,528	584	814	451	34,770
May	16,363	528	777	435	32,460
June	21,342	711	1,180	400	42,330
July	8,983	290	582	115	17,820
August	8,663	279	430	225	17,180
September 1979	8,773	292	377	128	17,400
1979 water year	148,433	407	2,700	105	294,400



Comparison of discharge during 1979 water year with 1978 water year and with average discharge for water years 1931-40 and 1963-77.

06326500 POWDER RIVER AT LOCATE, MT

LOCATION.--Lat 46°25'48", long 105°18'34", in SW1/4 SW1/4 SE1/4 sec.23, T.8 N., R.51 E., Custer County, Hydrologic Unit 10090209, on right bank at downstream side of bridge on Highway 12, 0.12 mi (0.19 km) west of Locate, and 25 mi (40 km) east of Miles City.

DRAINAGE AREA.--13,189 mi^2 (34,160 km^2). Drainage area at site used Oct. 1, 1977, to Mar. 21, 1978, 13,194 mi^2 (34,172 km^2).

PERIOD OF RECORD.--March 1938 to current year. Oct. 5, 1966, to Mar. 21, 1978, published as "near Locate." Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 2,384.79 ft (726.884 m) National Geodetic Vertical Datum of 1929 (levels by Army Corps of Engineers). Prior to July 11, 1947, non-recording gage at bridge 50 ft (15 m) upstream, and July 11, 1947, to Sept. 30, 1965, water-stage recorder at present site and datum. Oct. 1, 1965, to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966, to Mar. 21, 1978, water-stage recorder 1.5 mi (2.4 km) downstream at different datum.

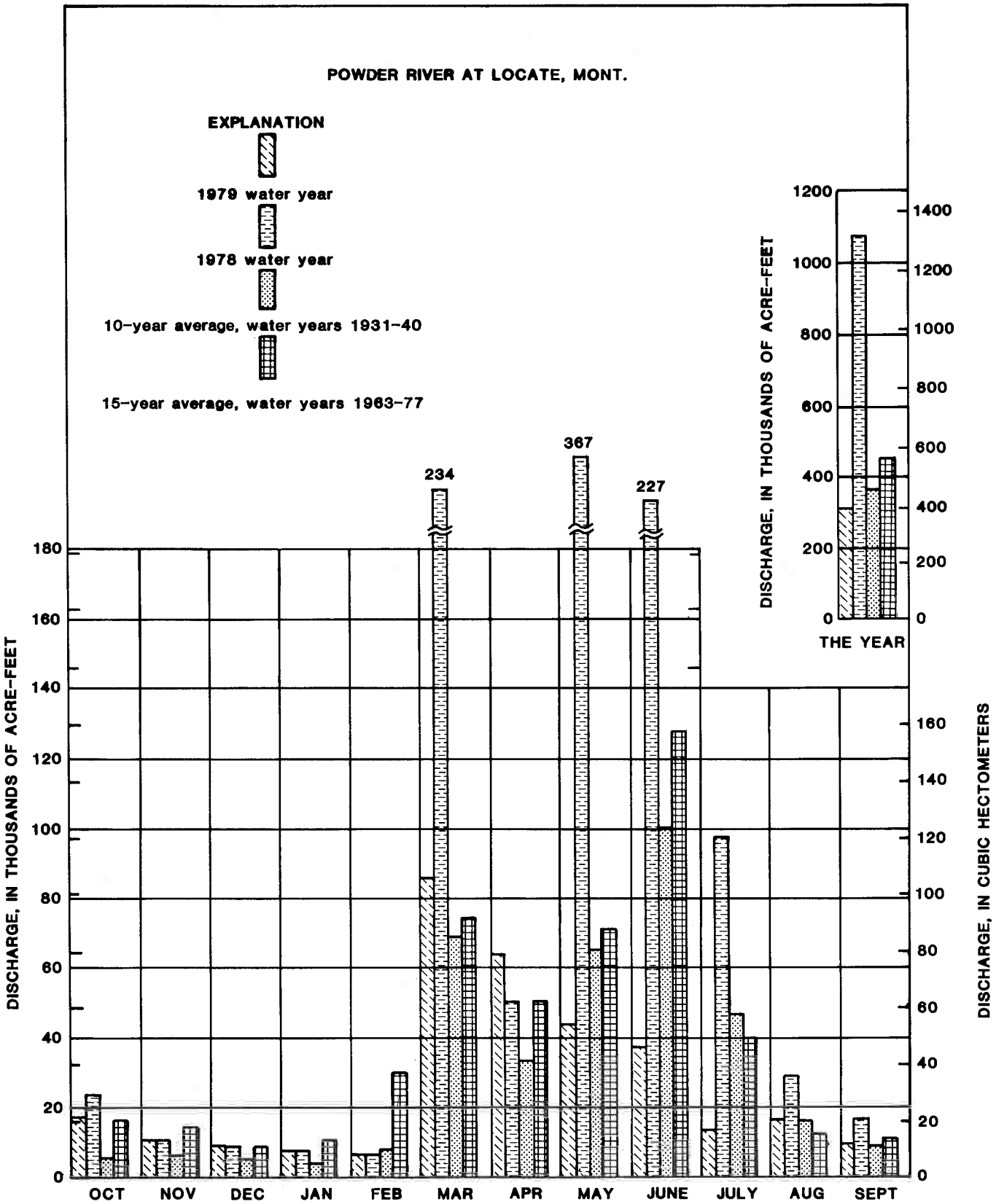
REMARKS.--Records good except those for winter period, which are poor, and those for July 7 to Sept. 30, which are fair. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft (45.4 hm^3). Diversions for irrigation of about 74,500 acres (302 km^2) above station.

AVERAGE DISCHARGE.--41 years, 632 ft^3/s (17.90 m^3/s), 475,900 acre-ft/yr (565 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 31,000 ft^3/s (878 m^3/s) Feb. 19, 1943, maximum gage height, 12.27 ft (3.740 m) Mar. 16, 1978 (backwater from ice); no flow Jan. 16 to Feb. 12, Feb. 22-24, 1950, July 27, Sept. 21-27, Oct. 1, 1960, Sept. 4-8, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 5,500 ft^3/s (156 m^3/s) Mar. 18, gage height, 6.68 ft (2.036 m), only peak above base of 5,000 ft^3/s (142 m^3/s); maximum gage height, 6.91 ft (2.106 m) Mar. 18 (backwater from ice jam); minimum daily discharge, 62 ft^3/s (1.76 m^3/s) Nov. 21 (result of freezeup).

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1978	9,205	297	318	277	18,260
November	5,175	173	338	62	10,260
December	4,954	160	220	70	9,830
January 1979	3,897	126	180	70	7,730
February	3,376	121	170	90	6,700
March	42,450	1,370	5,020	110	84,380
April	32,195	1,073	1,470	654	63,860
May	21,598	697	965	517	42,840
June	19,375	646	1,200	412	38,430
July	7,049	227	407	93	13,980
August	8,588	277	702	110	17,030
September 1979	5,314	177	424	73	10,540
1979 water year	163,266	447	5,020	62	323,800


POWDER RIVER AT LOCATE, MONT.
EXPLANATION
1979 water year
1978 water year
10-year average, water years 1931-40
15-year average, water years 1963-77
234
367
227
DISCHARGE, IN THOUSANDS OF ACRE-FEET
DISCHARGE, IN CUBIC HECTOMETERS
THE YEAR
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT

REVISED MONTHLY SUMMARY OF DISCHARGE FOR COMPACT STREAM-GAGING STATIONS, 1978 WATER YEAR

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MT

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1977	5,128	165	189	152	10,170
November	4,607	154	180	100	9,140
December	4,470	144	170	100	8,870
January 1978	3,810	123	150	100	7,560
February	3,930	140	160	120	7,800
March	12,612	407	1,120	110	25,020
April	11,521	384	2,380	197	22,850
May	88,409	2,852	15,800	853	175,400
June	54,540	1,818	2,380	1,280	108,200
July	22,182	716	1,420	342	44,000
August	8,326	269	356	198	16,510
September 1978	8,009	267	503	154	15,890
1978 water year	227,544	623	15,800	100	451,300

06294700 BIGHORN RIVER AT BIGHORN, MT

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre feet	Adjusted runoff, in acre-feet*
October 1977	46,487	1,500	1,800	917	92,210	132,100
November	36,690	1,223	2,400	600	72,770	96,800
December	66,770	2,154	3,100	1,200	132,400	99,300
January 1978	77,100	2,487	3,000	1,900	152,900	90,400
February	91,720	3,276	4,200	2,400	181,900	103,300
March	155,580	5,019	7,840	3,200	308,600	260,400
April	130,880	4,363	8,570	2,800	259,600	288,800
May	275,720	8,894	50,000	3,560	546,900	843,100
June	289,880	9,663	11,400	8,170	575,000	615,000
July	330,550	10,660	11,700	8,350	655,600	671,600
August	203,590	6,567	8,320	4,280	403,800	269,800
September 1978	113,220	3,774	5,590	2,890	224,600	246,600
1978 water year	1,818,187	4,981	50,000	600	3,606,000	3,716,900

*Adjusted for change in contents in Bighorn Lake

06306250 PRAIRIE DOG CREEK NEAR ACME, WY

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1977	1,274	41.1	58	31	2,530
November	833	27.8	39	14	1,650
December	818	26.4	52	9.0	1,620
January 1978	545	17.6	25	10	1,080
February	514	18.4	25	12	1,020
March	3,097	99.9	343	10	6,140
April	1,381	46.0	189	28	2,740
May	11,893	384	3,090	69	23,590
June	2,587	86.2	227	35	5,130
July	980	31.6	48	18	1,940
August	1,416	45.7	65	27	2,810
September 1978	1,235	41.2	61	24	2,450
1978 water year	26,573	72.8	3,090	9.0	52,700

06308500 TONGUE RIVER AT MILES CITY, MT

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1977	7,745	250	451	171	15,360
November	5,251	175	243	110	10,420
December	5,305	171	235	100	10,520
January 1978	5,175	167	180	130	10,260
February	4,945	177	260	135	9,810
March	33,299	1,074	4,800	180	66,050
April	19,437	648	684	600	38,550
May	92,482	2,983	7,700	552	183,400
June	114,740	3,825	4,940	3,170	227,600
July	41,334	1,333	2,780	866	81,990
August	19,148	618	919	352	37,980
September 1978	11,095	370	697	203	22,010
1978 water year	359,956	986	7,700	100	714,000

06326500 POWDER RIVER AT LOCATE, MT

Month	Second foot-days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1977	11,566	373	1,030	188	22,940
November	5,272	176	265	86	10,460
December	4,560	147	170	100	9,040
January 1978	4,252	137	170	120	8,430
February	3,602	129	140	120	7,140
March	118,165	3,812	20,000	120	234,400
April	25,908	864	2,170	444	51,390
May	185,057	5,970	22,200	436	367,100
June	114,640	3,821	6,090	2,280	227,400
July	48,355	1,560	2,710	752	95,910
August	13,718	443	779	305	27,210
September 1978	8,451	282	690	96	16,760
1978 water year	543,546	1,489	22,200	86	1,078,000

MONTHLY SUMMARY OF CONTENTS FOR COMPACT RESERVOIRS COMPLETED AFTER JANUARY 1, 1950

06258900 BOYSEN RESERVOIR, WY

LOCATION.--Lat 43°25'00", long 108°10'37", in NW1/4 NW1/4 sec.16, T.5 N., R.6 E., Fremont County, at dam on Wind River, 13 mi (21 km) north of Shoshoni, Wyoming.

DRAINAGE AREA.--7,700 mi^2 (19,943 km^2).

PERIOD OF RECORD.--October 1951 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by Water and Power Resources Service).

REMARKS.--Reservoir is formed by rock-fill dam completed in October 1951. Storage began Oct. 11, 1951. Usable capacity, 742,100 acre-ft (915 hm^3) between elevation 4,657.00 ft (1,419.454 m), invert of penstock pipe, and 4,725.00 ft (1,440.180 m), top of spillway gate. Dead storage, 59,880 acre-ft (73.8 hm^3) below elevation 4,657.00 ft (1,419.454 m). Prior to Jan. 1, 1966, usable capacity was 757,800 acre-ft (934 hm^3) and dead storage was 62,000 acre-ft (76.4 hm^3), at same elevations. Crest of dam is at elevation 4,758 ft (1,450 m). Figures given herein represent usable contents. Water used for irrigation, flood control, and power development.

COOPERATION.--Records furnished by Water and Power Resources Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 862,500 acre-ft (1,060 hm^3) July 6, 7, 1967, elevation, 4,730.83 ft (1,441.957 m); minimum daily since normal use of water started, 189,800 acre-ft (234 hm^3) Mar. 18, 19, 1956, elevation, 4,684.18 ft (1,427.738 m), capacity table then in use.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 575,700 acre-ft (710 hm^3) Sept. 6, elevation, 4,715.79 ft (1,437.373 m); minimum daily, 433,900 acre-ft (535 hm^3) May 17, elevation, 4,706.48 ft (1,434.535 m).

Month	Water-surface elevation, in feet	Contents*, in acre-feet	Change in contents, in acre-feet
September 30, 1978.	4,721.82	681,600	
October 31.	4,719.60	641,300	-40,300
November 30	4,716.73	591,500	-49,800
December 31	4,714.42	553,300	-38,200
January 31, 1979.	4,712.54	523,500	-29,800
February 28	4,711.04	500,500	-23,000
March 31.	4,711.54	508,100	+7,600
April 30.	4,707.34	446,100	-62,000
May 31.	4,712.65	525,200	+79,100
June 30	4,715.10	564,300	+39,100
July 31	4,714.73	558,300	-6,000
August 31	4,715.71	574,400	+16,100
September 30, 1979.	4,715.32	567,900	-6,500
1979 water year			-113,700

* Does not include dead storage of 59,880 acre-feet (73.8 hm^3).

06260300 ANCHOR RESERVOIR, WY

LOCATION.--Lat 43°39'50", long 108°49'27", in sec.26, T.43 N., R.100 W., Hot Springs County, at dam on South Fork Owl Creek, 2 mi (3 km) downstream from Middle Fork, 3 mi (5 km) southeast of Anchor, and 32 mi (51 km) west of Thermopolis.

DRAINAGE AREA.--125 mi^2 (324 km^2), approximately.

PERIOD OF RECORD.--November 1960 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (Water and Power Resources Service datum).

REMARKS.--Reservoir is formed by concrete arch dam completed in 1960. Usable capacity, 17,170 acre-ft (21.2 hm^3) between elevation 6,343.75 ft (1,933.575 m), invert of river outlet, and 6,441.00 ft (1,963.217 m), spillway crest, not including 68 acre-ft (83,800 m^3) below elevation 6,343.75 ft (1,933.575 m). Prior to Oct. 1, 1971, usable capacity was 17,280 acre-ft (21.3 hm^3) not including 149 acre-ft (184,000 m^3) below the invert. Figures given herein represent usable contents. Water is used for irrigation of land in Owl Creek basin.

COOPERATION.--Records furnished by Water and Power Resources Services.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 9,250 acre-ft (11.4 hm^3) July 4, 1967 (elevation, 6,418.52 ft or 1,956.365 m); no storage on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 899 acre-ft (1.11 hm^3) May 30, (elevation, 6,370.19 ft or 1,941.634 m); no storage on many days.

Month	Water-surface elevation, in feet	Contents*, in acre-feet	Change in contents, in acre-feet
September 30, 1978.	-	0	0
October 31.	-	0	0
November 30	-	0	0
December 31	-	0	0
January 31, 1979.	-	0	0
February 28	-	0	0
March 31.	-	0	0
April 30.	-	0	0
May 31.	6,369.35	842	+842
June 30	-	0	-842
July 31	-	0	0
August 31	-	0	0
September 30, 1979.	-	0	0
1979 water year			0

*Does not include dead storage of 68 acre-feet (83,800 m^3).

06286400 BIGHORN LAKE NEAR ST. XAVIER, MT

LOCATION.--Lat 45°18'27", long 107°57'26", in SW1/4 SE1/4 sec.18, T.6 S., R.31 E., Big Horn County, Hydrologic Unit 10080010, in block 13 of Yellowtail Dam on Bighorn River, 1.3 mi (2.1 km) upstream from Grapevine Creek, 15.5 mi (24.9 km) southeast of St. Xavier, and at mile 81.0 (130.3 km).

DRAINAGE AREA.--19,626 mi^2 (50,831 km^2).

PERIOD OF RECORD.--November 1965 to current year (monthend contents only). Prior to October 1969, published as "Yellowtail Reservoir."

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by Water and Power Resources Service).

REMARKS.--Reservoir is formed by thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,356,000 acre-ft (1.67 km^3) between elevation 3,296.50 ft (1,004.773 m), river outlet invert, and 3,657.00 ft (1,114.654 m), top of flood control. Elevation of spillway crest, 3,593.00 ft (1,095.146 m). Normal maximum operating level, 1,097,000 acre-ft (1.35 km^3), elevation, 3,640.00 ft (1,109.472 m). Minimum operating level, 483,400 acre-ft (596 hm^3), elevation 3,547.00 ft (1,081.126 m). Dead storage, 18,970 acre-ft (23.4 hm^3) below elevation 3,296.50 ft (1,004.773 m). Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Elevations and capacity table furnished by Water and Power Resources Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,346,000 acre-ft (1.66 km^3) July 6, 1967, elevation, 3,656.43 ft (1,114.480 m); minimum since first filling, 660,700 acre-ft (815 hm^3) Mar. 11, 1970, elevation, 3,584.45 ft (1,092.540 m).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 1,072,000 acre-ft (1.32 km^3) June 29, elevation, 3,637.95 ft (1,108.847 m); minimum daily 831,200 acre-ft (1.02 km^3) Mar. 8, elevation, 3,611.87 ft (1,100.898 m).

Month	Water-surface elevation, in feet	Contents*, in acre-feet	Change in contents, in acre-feet
September 30, 1978	3,635.41	1,042,000	
October 31	3,635.65	1,045,000	+3,000
November 30	3,632.30	1,008,000	-37,000
December 31	3,624.49	933,700	-74,300
January 31, 1979	3,619.26	890,500	-43,200
February 28	3,613.07	839,500	-51,000
March 31	3,618.82	887,300	+47,800
April 30	3,621.21	905,800	+18,500
May 31	3,628.03	965,700	+59,900
June 30	3,637.75	1,069,000	+103,300
July 31	3,630.80	992,700	-76,300
August 31	3,629.23	977,200	-15,500
September 30, 1979	3,629.24	977,300	+100
1979 water year			-64,700

* Does not include dead storage of 18,970 acre-feet (23.4 hm^3).

MONTHLY SUMMARY OF CONTENTS FOR COMPACT RESERVOIRS IN EXISTENCE ON JANUARY 1, 1950

The extent, if any, of the use of reservoirs in this category which may be subject to Compact allocations was not determined. As a matter of hydrologic interest the monthend contents in acre-feet of four reservoirs are given. The first three reservoirs are in the Bighorn River basin, Wyoming, and data on contents were furnished by the U.S. Water and Power Resources Service. Tongue River Reservoir in Montana is operated under the supervision of the Water Resources Division of the Montana Department of Natural Resources and Conservation, which agency furnished operating data.

Contents, in acre-feet

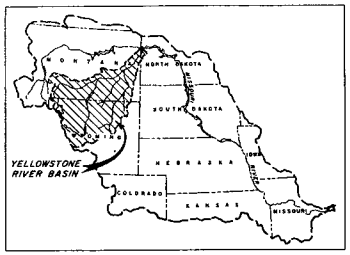
Month	06224500 [a]/Bull Lake	[b]/Pilot Butte Reservoir	06281500 [c]/Buffalo Bill Reservoir	06307000 [d]/Tongue River Reservoir
September 30, 1978. . .	107,300	20,750	348,400	20,780
October 31.	107,100	20,000	315,100	30,360
November 30	106,200	19,630	293,300	37,010
December 31	106,000	19,180	265,700	25,770
January 31, 1979. . . .	106,500	18,760	235,700	20,080
February 28	106,500	18,400	224,700	18,020
March 31.	106,600	18,120	211,200	28,760
April 30.	106,600	18,650	190,900	36,800
May 31.	120,400	25,340	248,400	47,720
June 30	136,900	21,050	373,900	60,100
July 31	107,100	17,520	353,500	44,400
August 31	91,200	20,980	300,400	28,420
September 30, 1979. . .	73,600	8,430	242,800	15,000
Change in contents during water year. .	-33,700	-12,320	-105,600	-5,780

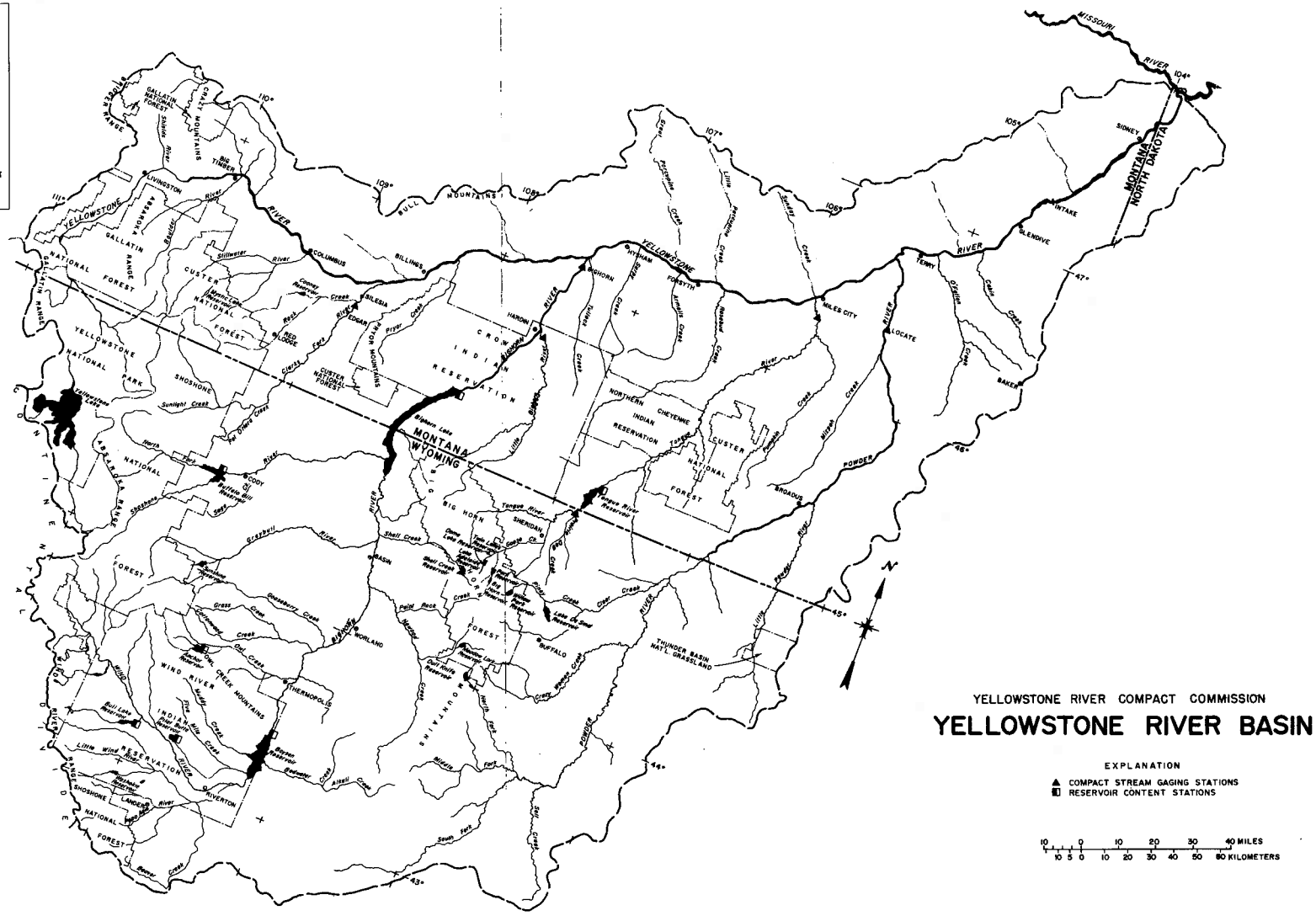
a/ Usable contents, from revised capacity table effective October 1, 1965. Dead storage is 722 acre-ft (890,000 m^3).

b/ Usable contents. Dead storage is 5,360 acre-ft (6.61 hm^3).

c/ Usable contents, from revised capacity table based on survey of 1959. Contents prior to October 1960 based on survey of 1941. Dead storage is negligible.

d/ Usable contents. Dead storage is 1,400 acre-ft (1.73 hm^3). Contents based upon sedimentation surveys of October 1948.





YELLOWSTONE RIVER COMPACT COMMISSION

YELLOWSTONE RIVER BASIN

EXPLANATION

▲ COMPACT STREAM GAGING STATIONS
▣ RESERVOIR CONTENT STATIONS

10 0 0 10 20 30 40 MILES
10 5 0 10 20 30 40 50 60 KILOMETERS

MAP SHOWING LOCATIONS OF COMPACT STREAM-GAGING AND RESERVOIR-CONTENT STATIONS