STREAMFLOW CHARACTERISTICS FOR THE BLACK HILLS OF SOUTH DAKOTA, THROUGH WATER YEAR 1993

By LISA D. MILLER and DANIEL G. DRISCOLL

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For additional information write to:

District Chief
U.S. Geological Survey
1608 Mt. View Road
Rapid City, SD 57702

Copies of this report can be purchased from:

U.S. Geological Survey
Branch of Information Services
Box 25286
Denver, CO 80225-0286

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Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter
inch (in.)	25.4	millimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
	Area	
acre	4,047	square meter
acre	0.4047	hectare
square mile (mi^2)	259.0	hectare
square mile (mi^2)	2.590	square kilometer
	Volume	
cubic foot (ft^3)	0.02832	cubic meter
acre-foot (acre-ft)	1,233	cubic meter
acre-foot (acre-ft)	0.001233	cubic hectometer
	Flow rate	
inch per year (in/yr)	25.4	millimeter per year
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year
acre-foot per year (acre-ft/yr)	0.001233	cubic hectometer per year
cubic foot per second (ft^3/s)	0.02832	cubic meter per second

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8 \times °C) + 32$$

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

$$°C = (°F - 32) / 1.8$$

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Water year: In Geological Survey reports dealing with surface-water supply, water year is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends; thus, the water year ending September 30, 1993, is called the "1993 water year."

Streamflow Characteristics for the Black Hills of South Dakota, through Water Year 1993

By Lisa D. Miller *and* Daniel G. Driscoll

ABSTRACT

This report summarizes streamflow records and describes streamflow characteristics for streams draining the Black Hills of western South Dakota. Monthly and annual streamflow records are tabulated for all available years of record, through water year 1993, for 129 continuous-record gaging stations, including 111 stations for which records of daily flow are available and 18 stations for which only monthly records are available. Various summary statistics and graphics are presented for stations with sufficient periods of record. In addition to streamflow summaries, records of monthend contents are presented for five reservoirs operated by the Bureau of Reclamation in the Black Hills area.

Streamflow characteristics are described for four categories of hydrogeologic settings, including interior sedimentary basins, interior crystalline basins, interior basins downstream of loss zones (loss-zone basins), and exterior basins. All of the interior basins are located predominantly within the outermost extent of the outcrop of the Inyan Kara Group and the exterior basins are located predominantly beyond this outcrop.

Distinct differences in variability of annual and monthly streamflow are described for the four categories of hydrogeologic settings. The interior sedimentary basins, which are dominated by springflow from headwater areas, have the smallest variability in both annual and monthly flow, as a group. The exterior basins, as a group, have the largest variability in both annual and monthly flow. Streamflow variability for the interior crystalline basins, which are composed primarily of Precambrian and Tertiary igneous and metamorphic rocks, generally falls midway between the interior sedimentary and exterior basins. Loss-zone stations, which are located downstream of loss zones that occur where streams cross outcrops of the Madison Limestone and other overlying sedimentary units, exhibit the widest range in streamflow variability of any of the categories. Most of the loss-zone basins have springs located upstream of the gaging stations, but downstream of the loss zones. Flow at several of the loss-zone stations is dominated by large and consistent springflow; however, flow at other loss-zone stations is dominated by streamflow losses or by tributary inflows between the loss zones and the gaging stations, which results in extremely variable streamflow characteristics. It is demonstrated that springflow in Battle, Spring, Elk, and Bear Butte Creeks is much more variable than in Cascade Springs, Fall River, Beaver Creek, and Redwater River.

Interior crystalline basins and exterior basins are shown to be much more responsive to climatic conditions than the springflow-dominated basins. Zero-flow months have been recorded for all of the exterior basins and most of the interior crystalline basins; however, zero-flow months have not been recorded for any of the interior sedimentary basins. Zero-flow months have not been recorded for the loss-zone stations with large,

consistent springflow; however, zero-flow months are common for loss-zone stations with smaller, less consistent springs.

Direct surface runoff is demonstrated to be uncommon for outcrops of the Madison Limestone and Minnelusa Formation. Examination of streamflow records for two basins with large outcrops of these formations indicates that direct surface runoff seldom occurs.

Annual streamflow is shown to increase from south to north, which is consistent with climatic patterns for the area. Annual yield generally is larger for all of the interior categories than for the exterior basins; however, this is consistent with larger precipitation and smaller evapotranspiration rates at higher elevations. Annual yields generally are largest for the interior sedimentary basins; however, all of these basins are located in the northern Black Hills. Interior crystalline basins located in the northern Black Hills have annual yields that are comparable with interior sedimentary basins.

INTRODUCTION

The Black Hills area is an important resource center for the State of South Dakota. Not only do the Black Hills provide an economic base for western South Dakota through tourism, agriculture, the timber industry, and mineral resources; they also are an important source of water. Water originating in the area is used for municipal, industrial, agricultural, and recreational purposes throughout much of western South Dakota.

Population growth and resource development have the potential to affect the quantity, quality, and availability of water within the Black Hills area. Because of this concern, the Black Hills Hydrology Study was initiated in 1990 to assess the quantity, quality, and distribution of surface water and ground water in the Black Hills area of South Dakota (Driscoll, 1992). This long-term study is a cooperative effort between the U.S. Geological Survey (USGS); the South Dakota Department of Environment and Natural Resources; and the West Dakota Water Development District, which represents various local and county cooperators.

Purpose and Scope

One of the specific objectives of the Black Hills Hydrology Study is to describe streamflow for the Black Hills area. The purpose of this report is to fulfill that objective by summarizing streamflow records and describing streamflow characteristics for streams draining the Black Hills of South Dakota.

Description of Study Area

The Black Hills are situated between the Cheyenne and Belle Fourche Rivers (fig. 1). The Belle Fourche River, with a drainage area of 7,210 mi^2 at USGS gaging station 06438000, is the largest tributary to the Cheyenne River, which has a drainage area of 23,900 mi^2 at gaging station 06439300. The study area for the Black Hills Hydrology Study includes the topographically defined Black Hills, which is represented in figures 1 and 2 by the outer extent of the outcrop of the Inyan Kara Group.

Physiography and Climate

The Black Hills area is an elongated, domal feature, about 125 mi long and 60 mi wide, that was uplifted during the Laramide orogeny (Feldman and Heimlich, 1980). Elevations range from about 7,200 ft above sea level at the higher peaks to approximately 3,000 ft in the surrounding plains. Most of the higher elevations are heavily forested with ponderosa pine, which is the primary product of an active timber industry. White spruce, quaking aspen, paper birch, and other native trees and shrubs are found in cooler, wetter areas (Orr, 1959). The lower elevations surrounding the Hills are primarily urban, suburban, and agricultural. Numerous deciduous species such as cottonwood, ash, elm, oak, and willow are common along stream bottoms in the lower elevations. Rangeland, hayland, and winter wheat farming are the principal agricultural uses for dryland areas. Alfalfa, corn, and vegetables are produced in bottom lands and in irrigated areas. Various other crops, primarily for cattle fodder, are produced in both dryland areas and in bottom lands.

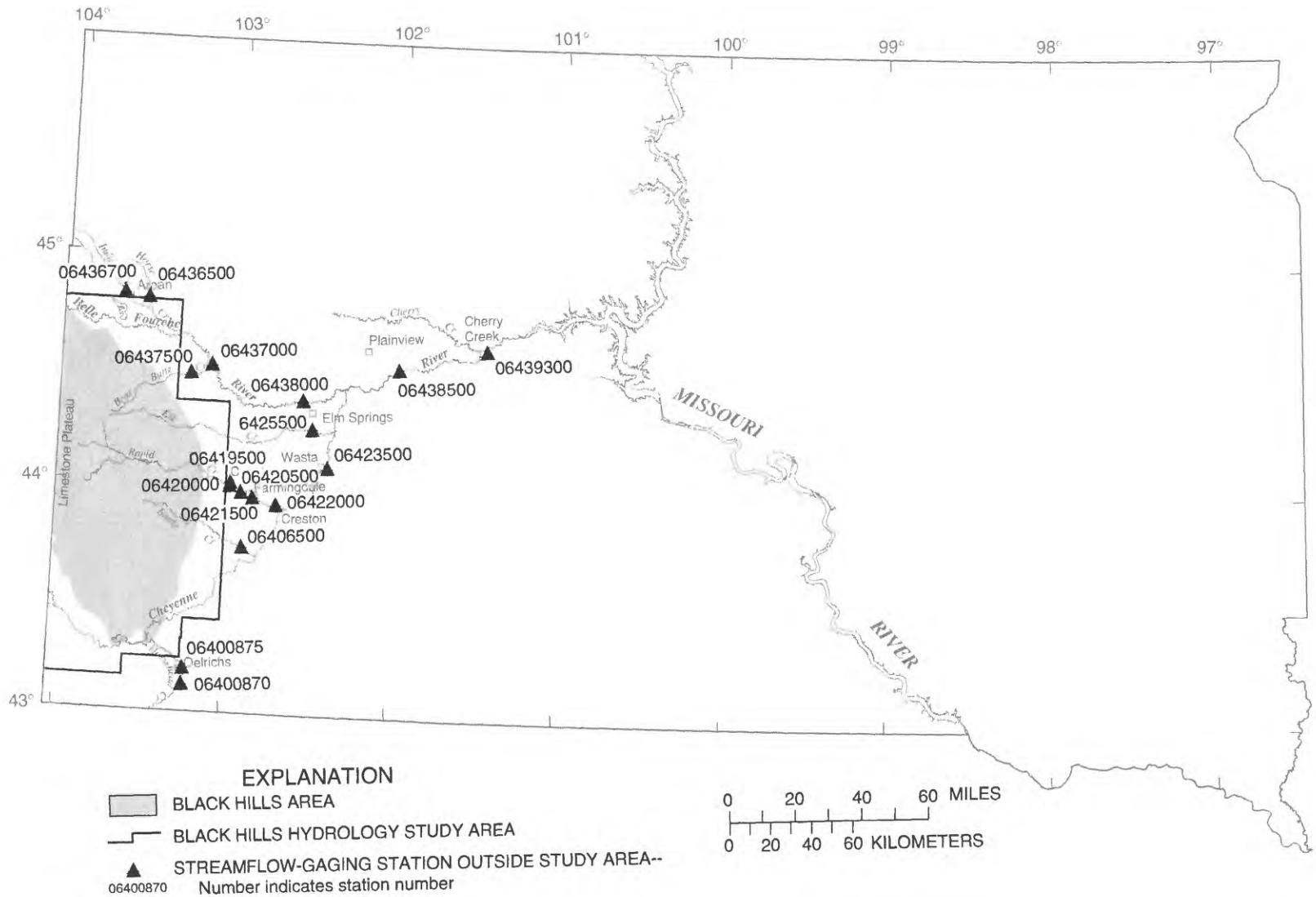
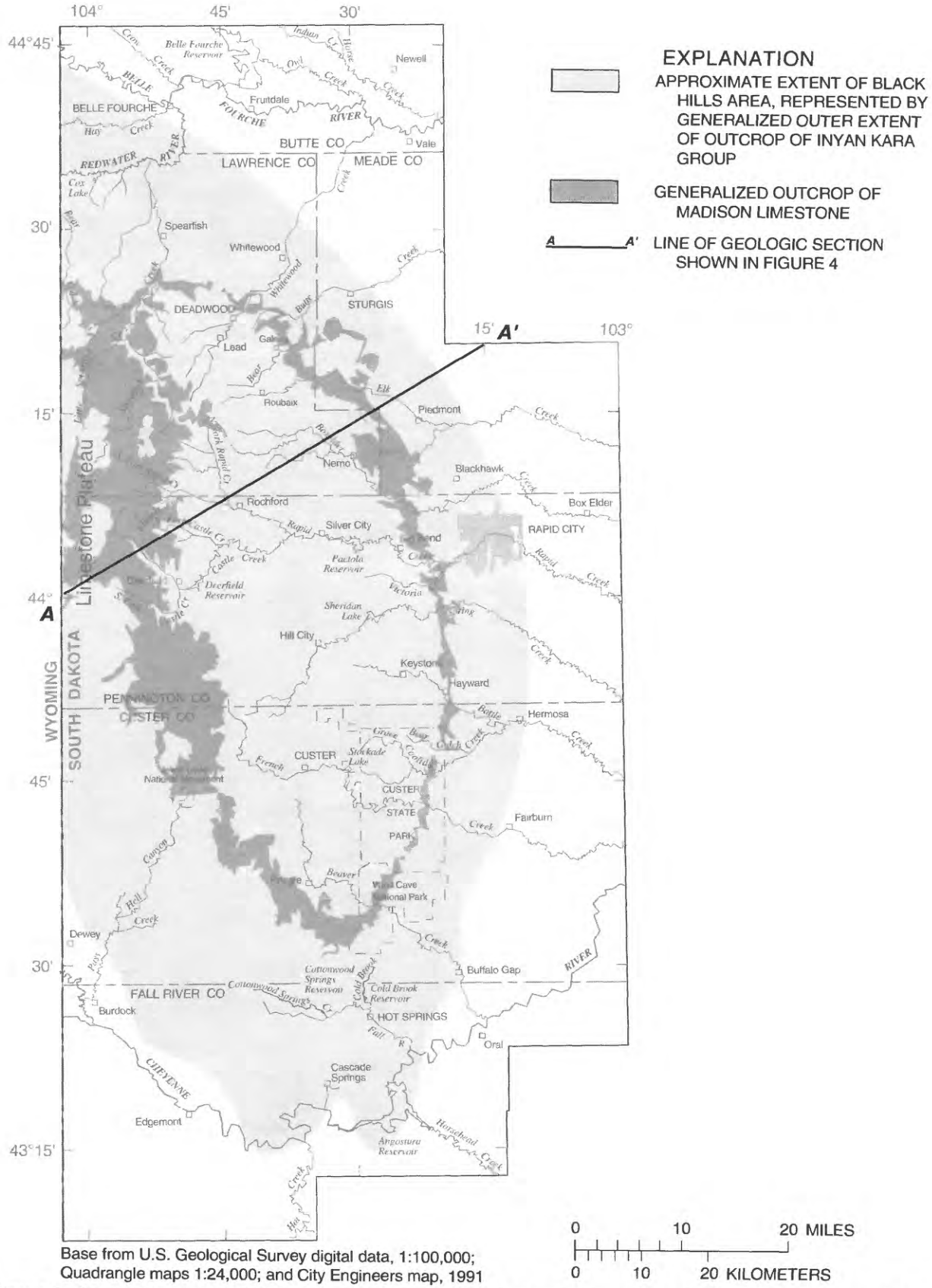


Figure 1. Area of investigation for Black Hills Hydrology Study showing locations of gaging stations outside of the study area for which data are presented.



Base from U.S. Geological Survey digital data, 1:100,000; Quadrangle maps 1:24,000; and City Engineers map, 1991

Figure 2. Generalized outcrop of Madison Limestone and outer extent of Inyan Kara Group, within study area for Black Hills Hydrology Study.

The overall climate of the Black Hills area is continental, with generally low precipitation amounts, hot summers, cold winters, and extreme variations in both precipitation and temperatures (Johnson, 1933). Climatic conditions are locally affected by topography, with generally lower temperatures and higher precipitation at the higher elevations. The average annual temperature (1961-90) for the Black Hills area is 43.9 degrees Fahrenheit (U.S. Department of Commerce, 1994), and ranges from 47.6 degrees at Hot Springs (fig. 2; elevation = 3,559 ft) to approximately 37 degrees near Deerfield Reservoir (elevation = 6,060 ft). Average annual precipitation is 21.30 in., and ranges from 15.08 in. at Hot Springs to 28.65 in. at Lead (elevation = 5,350 ft). Average annual precipitation also generally increases from south to north, by as much as 5 to 10 in/yr (Addison, 1991). Average annual evaporation generally exceeds average annual precipitation throughout the study area. Average pan evaporation for April through October (U.S. Department of Commerce, 1994) is about 30 in. at Pactola Reservoir (elevation = 4,720 ft) and about 50 in. at Oral (elevation = 2,960 ft).

Hydrogeology

Much of the surface-water hydrology of the Black Hills area is controlled by geologic features. The oldest geologic units in the stratigraphic sequence are the Precambrian metamorphic and igneous rocks (fig. 3), which are exposed in the central core of the Black Hills, extending from near Lead to south of Custer. The Precambrian rocks generally are of low permeability; however, localized fracture systems can provide adequate well yields for limited use. Various Tertiary intrusive rocks, with hydrogeologic characteristics similar to the Precambrian rocks, are exposed in the northern Black Hills.

Surrounding the central core is a layered series of sedimentary rocks including limestones, sandstones, and shales that are exposed in roughly concentric rings around the uplifted flanks of the Black Hills (DeWitt and others, 1989). The generalized outcrop of the Madison Limestone, also known locally as the Pahasapa Limestone, is shown as an example in figure 2. The generalized outer extent of the outcrop of the Inyan Kara Group, which approximates the outer extent of the Black Hills uplift, also is shown in figure 2. The bedrock sedimentary formations typically dip away from the uplifted Black Hills at angles that approach or exceed 10 degrees near the outcrops, and decrease with distance from the uplift (fig. 4).

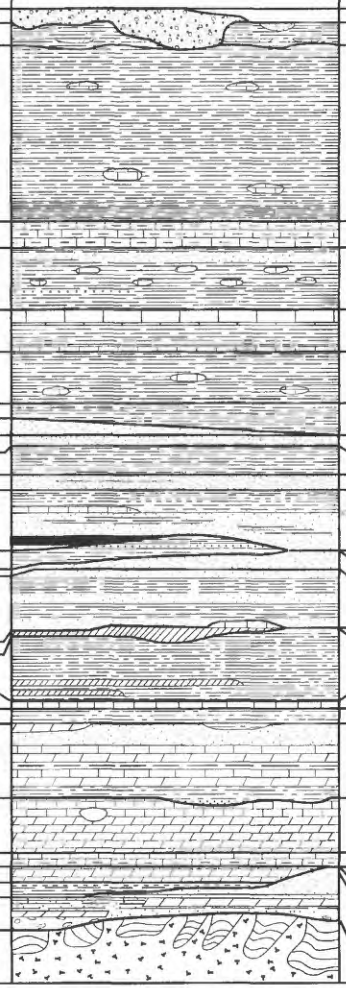
Many of the sedimentary units are aquifers, both within and beyond the study area. Recharge to these aquifers is from precipitation upon the outcrops and from stream infiltration along the flanks of the Black Hills (Greene, 1993; Kyllonen and Peter, 1987; Peter, 1985). Within the Paleozoic rock interval, aquifers in the Deadwood Formation, Madison Limestone, Minnelusa Formation, and Minnekahta Limestone are used extensively. These aquifers are collectively confined by the underlying Precambrian rocks and the overlying Spearfish Formation. Individually the aquifers are separated by minor confining layers, or by relatively impermeable layers within the individual formations. Leakance between these aquifers is extremely variable (Greene, 1993; Peter, 1985). Within the Mesozoic rock interval, aquifers in the Inyan Kara Group are used extensively. Aquifers in various other units within the Mesozoic interval are used locally to lesser degrees. As much as 4,000 ft of Cretaceous shales act as the upper confining layer to aquifers in the Mesozoic interval.

Artesian conditions generally exist within the aforementioned aquifers, where an upper confining layer is present. Under artesian conditions, water in a well will rise above the top of the aquifer in which it is completed. If the water level, or potentiometric surface, is above the land surface, a flowing well will result. Flowing wells and artesian springs that originate from confined aquifers are common around the periphery of the Black Hills. The hydrogeologic setting of the Black Hills area is schematically illustrated in figure 5.

Reservoirs and Water Use

Numerous agricultural, municipal, industrial, and recreational users utilize available water supplies in the Black Hills area. The natural flows of many streams within the study area are altered by regulation or diversions for these uses. Agricultural users in the area account for the largest consumptive uses of water, followed by municipal and industrial users. Major irrigation projects with large storage reservoirs are located along Rapid Creek and the Belle Fourche and Cheyenne Rivers. Significant irrigation diversions also occur from many other area streams.

ERATHEM	SYSTEM	ABBREVIATION FOR STRATIGRAPHIC INTERVAL	GEOLOGIC UNIT	THICKNESS IN FEET	DESCRIPTION
CENOZOIC	QUATERNARY & TERTIARY (?)	Qal, Qw, Qt	UNDIFFERENTIATED SANDS AND GRAVELS	0-50	Sand, gravel, and boulders.
		Tw	WHITE RIVER GROUP	0-600	Light colored clays with sandstone channel fillings and local limestone lenses.
	TERTIARY[1]	Kp	PIERRE SHALE	1200-2000	Principal horizon of limestone lenses giving teepee buttes. Dark-gray shale containing scattered concretions. Widely scattered limestone masses, giving small teepee buttes.
MESOZOIC	CRETACEOUS		Sharon Springs Mem.		Black fissile shale with concretions.
		Knig	NIOBRARA FORMATION	100-225	Impure chalk and calcareous shale.
			CARLILE FORMATION: Turner Sand Member	400-750	Light-gray shale with numerous large concretions and sandy layers.
			CARLILE FORMATION: Wall Creek Sands		Dark-gray shale
			GREENHORN FORMATION	(25-30) (200-350)	Impure slabby limestone. Weathers buff. Dark-gray calcareous shale, with thin Orman Lake limestone at base.
		Kb	GRANEROS GROUP: BELLE FOURCHE SHALE	300-550	Gray shale with scattered limestone concretions. Clay spur bentonite at base.
		Kms	GRANEROS GROUP: MOWRY SHALE	150-250	Light-gray siliceous shale. Fish scales and thin layers of bentonite.
			GRANEROS GROUP: MUDDY SANDSTONE: DYNNESON	20-60	Brown to light yellow and white sandstone.
			GRANEROS GROUP: MUDDY SANDSTONE: NEWCASTLE	170-270	Dark gray to black siliceous shale.
			GRANEROS GROUP: SKULL CREEK SHALE	10-200	Massive to slebby sandstone.
		KJim	INYAN KARA GROUP: FALL RIVER FORMATION	10-188	Coarse gray to buff cross-bedded conglomeratic sandstone, interbedded with buff, red, and gray clay, especially toward top. Local fine-grained limestone.
			INYAN KARA GROUP: LAKOTA FM: Fuson Shale	0-25	
			INYAN KARA GROUP: LAKOTA FM: Minnewaste Limestone	25-485	
	JURASSIC		MORRISON FORMATION	0-220	Green to maroon shale. Thin sandstone.
			UNKPAPA SS	0-225	*Massive fine-grained sandstone.*
		Jsg	SUNDANCE FORMATION: Redwater Member, Lak Member, Hulett Member, Stockade Beaver, Canyon Spr Member	250-450	Greenish-gray shale, thin limestone lenses. Glauconitic sandstone; red sandstone near middle.
			GYPSUM SPRING FORMATION	0-45	Red siltstone, gypsum, and limestone.
	TRIASSIC	TRPs	SPEARFISH FORMATION	250-700	Red sandy shale, soft red sandstone and siltstone with gypsum and thin limestone layers.
			Goose Egg Equivalent		Gypsum locally near the base.
PALEOZOIC	PERMIAN	Pmo	MINNEKAHTA LIMESTONE	30-50	Massive gray, laminated limestone.
			OPECHE FORMATION	50-135	*Red shale and sandstone.*
		PIPm	MINNELUSA FORMATION	350-850	Yellow to red cross-bedded sandstone, limestone, and anhydrite locally at top. Interbedded sandstone, limestone, dolomite, shale, and anhydrite.
	PENNSYLVANIAN				Red shale with interbedded limestone and sandstone at base.
	MISSISSIPPIAN	MDpe	MADISON (PAHASAPA) LIMESTONE	300-630	Massive light-colored limestone. Dolomite in part. Cavernous in upper part.
	DEVONIAN		*ENGLEWOOD LIMESTONE*	30-60	*Pink to buff limestone. Shale locally at base.*
	ORDOVICIAN	O€wd	WHITEWOOD (RED RIVER) FORMATION	0-60	Buff dolomite and limestone.
			WINNIPEG FORMATION	0-100	Green shale with siltstone.
	CAMBRIAN		DEADWOOD FORMATION	10-400	Massive to thin-bedded buff to purple sandstone. Greenish glauconitic shale flaggy dolomite and flatpebble limestone conglomerate. Sandstone, with conglomerate locally at the base.
PRECAMBRIAN		p€u	UNDIFFERENTIATED METAMORPHIC AND IGNEOUS ROCKS		Schist, slate, quartzite, and arkosic grit. Intruded by diorite, metamorphosed to amphibolite, and by granite and pagmatite.



[1] Also may include intrusive igneous rocks

Modified from information furnished by the Department of Geology and Geological Engineering, South Dakota School of Mines and Technology (written commun., January 1994)

Figure 3. Stratigraphic section for the Black Hills.

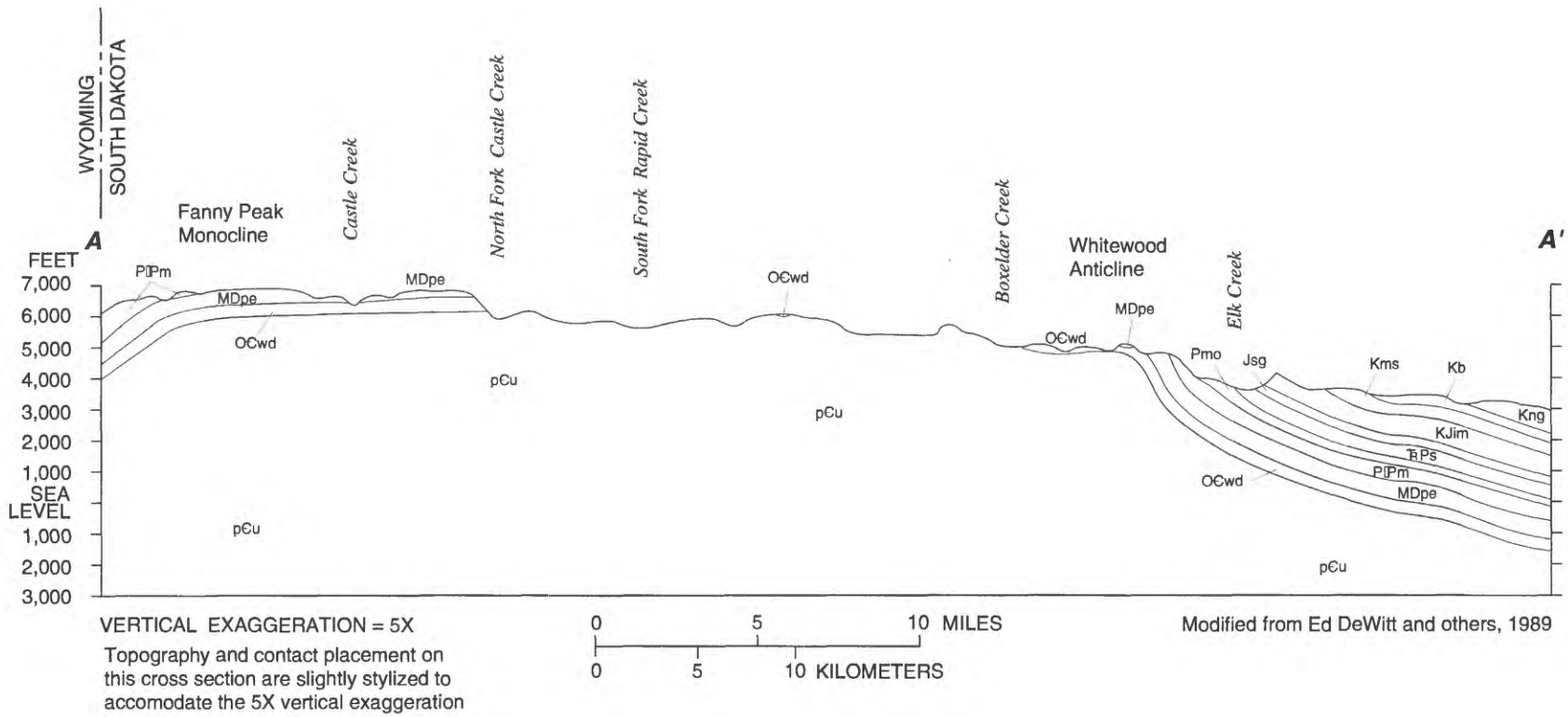


Figure 4. Generalized geologic section A-A'. (Location of section is shown in figure 2. Explanation of abbreviation for stratigraphic interval is shown in figure 3).

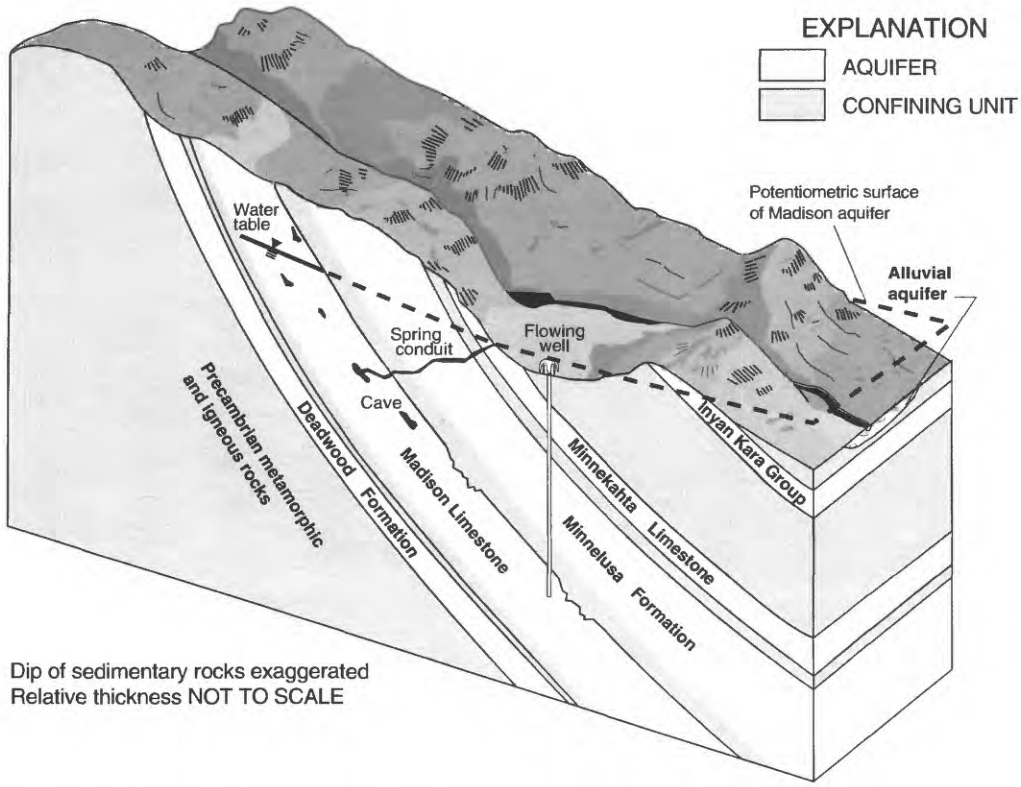


Figure 5. Schematic showing simplified hydrogeologic setting of the Black Hills area.

The USGS and the Bureau of Reclamation (Reclamation) have cooperated in collection and publication of storage information for five reservoirs (Angostura, Deerfield, Pactola, Keyhole, and Belle Fourche) in the Black Hills area. The USGS typically has assisted in collection of stage information, which is used by Reclamation for calculating records of reservoir contents. Records of monthend reservoir contents are provided by Reclamation for publication in USGS data reports. Records of monthend contents for Angostura, Deerfield, Pactola, Keyhole, and Belle Fourche Reservoirs, which have been published previously by the USGS, are summarized for all available years of record in Section A of the Supplemental Information section at the back of this report. The following paragraphs provide a brief description of each of these reservoirs.

Angostura Reservoir (fig. 2) is formed by a composite dam consisting of a concrete gravity structure and an earth embankment on the Cheyenne River. Water stored in the reservoir is used primarily for irrigation. Storage began in October 1949 and the dam was completed in December 1949. Live capacity is 122,100 acre-ft, of which active conservation capacity is 82,400 acre-ft and inactive capacity is 39,700 acre-ft. Dead storage (storage below lowest outlet point) is 8,600 acre-ft, and surcharge capacity (capacity above crest of spillway) is 56,400 acre-ft (Bureau of Reclamation, 1997).

Deerfield Reservoir (fig. 2) is formed by an earthfill dam on Castle Creek, a major tributary to Rapid Creek. Water from Deerfield Reservoir is used for municipal supply for Rapid City and for irrigation in the Rapid Valley Project downstream of Rapid City. Storage began in December 1945 and the dam was completed in 1947. Active conservation capacity is 15,504 acre-ft, dead storage is 151 acre-ft, and surcharge capacity is 26,655 acre-ft (Bureau of Reclamation, 1997).

Pactola Reservoir (fig. 2) is formed by an earthfill dam on Rapid Creek. Water from Pactola Reservoir is used for municipal supply for Rapid City and for irrigation in the Rapid Valley Project downstream of Rapid City. The dam was completed in August 1956, and storage began that same month. Active conservation capacity is 54,955 acre-ft, inactive capacity is

895 acre-ft, and dead storage is 122 acre-ft. Pactola Reservoir also provides 43,057 acre-ft of exclusive flood-control storage and 41,892 acre-ft of surcharge capacity (Bureau of Reclamation, 1997).

Keyhole Reservoir, which is located in Wyoming about 50 mi west of Spearfish, South Dakota, is formed by an earthfill dam on the Belle Fourche River. The reservoir provides supplemental irrigation storage for the Belle Fourche Project, which is located 146 river miles downstream. Keyhole Reservoir also supplies water for irrigation between the reservoir and the Belle Fourche Project. Storage began in February 1952, and the dam was completed in October 1952. Active conservation capacity is 185,801 acre-ft, inactive capacity is 7,226 acre-ft, and dead storage is 726 acre-ft. Surcharge capacity is 294,810 acre-ft, of which 140,462 acre-ft is designated as exclusive flood-control storage (Bureau of Reclamation, 1997).

Belle Fourche Reservoir (fig. 2) is an off-stream reservoir formed by an earthen dam on Owl Creek. Water is diverted from the Belle Fourche River through the Inlet Canal and is used for irrigation of project areas within and beyond the northern part of the study area. Storage began in May 1910 and the dam was completed in April 1911. Active conservation capacity is 185,277 acre-ft, dead storage is 6,800 acre-ft, and surcharge capacity is 86,139 acre-ft (Bureau of Reclamation, 1997).

Two small flood control reservoirs constructed by the U.S. Army Corps of Engineers are known to affect high flows of the Fall River near Hot Springs (fig. 2). Cold Brook Reservoir, with a capacity of 7,200 acre-ft, has regulated flows from Cold Brook since September 1952. Perennial flows occur into Cold Brook Reservoir; however, outflows are approximately equal to inflows, except when flood flows are stored (Kevin Grode, U.S. Army Corps of Engineers, written commun., Feb. 23, 1994). Cottonwood Springs Reservoir, with a capacity of 8,385 acre-ft, has regulated flows from Cottonwood Springs Creek since June 1969. Small, intermittent flows occur into Cottonwood Springs Reservoir; however, extended periods of zero inflow are common (Kevin Grode, U.S. Army Corps of Engineers, oral commun., Feb. 23, 1994).

Numerous other small reservoirs and stock dams are located within the study area. Most of these are operated as pass-through reservoirs under most conditions. The individual effects of such reservoirs on streamflow at various gaging stations generally are small. Potential, minor effects of small reservoirs generally are noted in station descriptions in USGS data reports.

The City of Rapid City is the largest municipal user of both surface and ground water in the Black Hills area. Numerous industries within Rapid City use modest quantities of water, most of which are obtained from the City's municipal supply. The largest industrial user in the Black Hills area is the Homestake Mining Company in Lead, which also supplies water to the Cities of Deadwood and Lead. An interbasin collection system is used to divert water to Whitewood Creek from Rapid, Elk, and Spearfish Creeks for these municipal and industrial uses. Homestake Mining Company also diverts water from Spearfish Creek for two hydropower stations; however, these flows are returned to Spearfish Creek.

Acknowledgments

The authors acknowledge the efforts of the West Dakota Water Development District for helping to develop the Black Hills Hydrology Study. West Dakota's coordination of various local and county cooperators has been a key element in making this study possible. The authors also recognize the numerous local and county cooperators represented by West Dakota, as well as the numerous private citizens who have helped provide guidance and support for the Black Hills Hydrology Study. In addition, the guidance and support of the South Dakota Department of Environment and Natural Resources is acknowledged.

SUMMARY OF STREAMFLOW GAGING IN THE BLACK HILLS

Since the turn of the century, more than 100 continuous-record streamflow-gaging stations have been operated in the Black Hills area by the USGS. Over the years, this network has been adapted to meet specific needs of Federal, State, and local cooperators to provide streamflow data for a variety of purposes (Little and Matthews, 1985). The following sections describe the history of streamflow gaging and summarize available streamflow records for the study area.

History of Streamflow Gaging

A list of continuous-record gaging stations operated in the Black Hills area is presented in table 1. Stations are arranged by station numbers, which increase in a downstream direction, according to the USGS downstream order system. Collection of streamflow data began in 1903 under the authority of the Sundry Civil Bill. A total of 13 stations were installed in the area during the period from 1903 through 1906; however, the program was discontinued in 1907 (Larimer, 1970). Eight new stations, as well as several stations that had been operated previously, were installed during four periods (1912-15, 1928-29, 1932-34, and 1938) of modest growth in the gaging program. Several of the stations installed during 1928-29 were under authority of the Flood Control Act, which established many stations on the Missouri River and its major tributaries (Little and Matthews, 1985). Two stations have been operated continuously since 1934 (06423500 and 06438000) and constitute the longest continuous streamflow records in the Black Hills area.

Beginning in the 1940's, numerous additional gaging stations were installed and operated for various purposes. Several Federal programs such as the Hydrologic Bench-Mark Network, National Stream-Quality Accounting Network, and Missouri River Basin Program have supported numerous gaging stations, primarily on major tributaries to the Missouri River. Both the Hydrologic Bench-Mark Network and the National Stream-Quality Accounting Network were designed by the USGS to obtain hydrologic data at selected sites throughout the country. The Missouri River Basin Program is supported primarily by the Bureau of Reclamation and is used to manage water resources in the region. During the mid-1940's, many streamflow-gaging stations were established under the Pick-Sloan Plan for Missouri Basin development (Decker, 1991). Additional stations were established during the late 1940's through the early 1960's in the Black Hills area for management of the Rapid Valley and Belle Fourche irrigation projects. In 1980 and 1981, several stations were established along Rapid Creek in Rapid City as part of the U. S. Environmental Protection Agency's Nationwide Urban Runoff Program (Goddard and Lockner, 1989). A portion of Whitewood Creek and the adjacent flood plain was listed as an Interim Priority Site under the Comprehensive Environmental Response Compensation and Liability Act of 1980. As a result, stations were established along Whitewood Creek in the early-1980's to monitor and study potential environmental problems associated with mining activities upstream (Goddard, 1989).

Numerous stations have been operated in cooperation with various State and local agencies. Many stations have been operated for water-rights purposes since the 1940's, in cooperation with the South Dakota Department of Environment and Natural Resources. In 1988, numerous stations were established along Rapid Creek as part of a study of ground-water/surface-water interactions. Numerous stations also were established in Pennington and Lawrence Counties during the late 1980's and early 1990's, as part of hydrologic investigations in these counties. As of March 1994, nineteen continuous-record streamflow-gaging stations, including many of the aforementioned Pennington and Lawrence County gages, were being operated as part of the Black Hills Hydrology Study (Driscoll, 1994).

Prior to about 1940, continuous streamflow data were obtained primarily from daily water-stage (height of the water surface above a reference elevation) measurements made by observers. After the mid-1940's, most continuous records of stage have been obtained from water-stage recorders, which generally record stage on either a continuous basis or at selected time intervals. Stage-discharge relations are developed for specific stream locations from periodic discharge measurements made at known stages (Wahl and others, 1995). These relations, in combination with stage records, are used to calculate streamflow records.

Summary of Streamflow Records

Summaries of streamflow records are presented for 129 continuous-record gaging stations that have been operated by the USGS within, or downstream from, the study area for the Black Hills Hydrology Study. This includes 111 stations for which records of daily flow have been reported and 18 stations for which only monthly records are available. For the stations with records of daily flow, 32 have less than 5 years of record, 27 have between 5 and 9 years of record, and 52 have 10 or more years of record.

The following summaries generally are presented by water year, which is the standard format for publication of streamflow records by the USGS (Rantz and others, 1982). A water year is a 12-month period that extends from October 1 through September 30 and is designated by the calender year in which it ends.

Table 1. Continuous-record streamflow-gaging stations operated in Black Hills area

Station number	Station name	Period of record through water year 1993
06394500	Beaver Creek near Burdock	1905-07, 1928-32
06394600	Hell Canyon near Jewel Cave, near Custer	1978-80
06394605	Hell Canyon near Custer	1978-80
06395000	Cheyenne River at Edgemont	1903-07, 1928-33, 1947-93
06400000	Hat Creek near Edgemont	1905-06, 1951-93
06400497	Cascade Springs near Hot Springs	1976-93
06400500	Cheyenne River near Hot Springs	1915-20, 1943-72
06400870	Horsehead Creek near Oelrichs	1982-83
06400875	Horsehead Creek at Oelrichs	1983-93
06401500	Cheyenne River below Angostura Dam	1946-93
06402000	Fall River at Hot Springs	1938-93
06402430	Beaver Creek near Pringle	1991-93
06402470	Beaver Creek above Buffalo Gap	1991-93
06402500	Beaver Creek near Buffalo Gap	1938-93
06402600	Cheyenne River near Buffalo Gap	1969-80
06402990	French Creek below Custer	1991-92
06402995	French Creek above Stockade Lake, near Custer	1991-93
06403000	French Creek near Custer	1945-47
06403300	French Creek above Fairburn	1982-93
06403500	French Creek near Fairburn	1945-47
06404000	Battle Creek near Keystone	1945-47, 1962-93
06404500	Battle Creek near Hermosa	1945-47
06404800	Grace Coolidge Creek near Hayward	1989-93
06404998	Grace Coolidge Creek near Game Lodge, near Custer	1977-93
06405000	Grace Coolidge Creek near Custer	1945-47, 1967-76

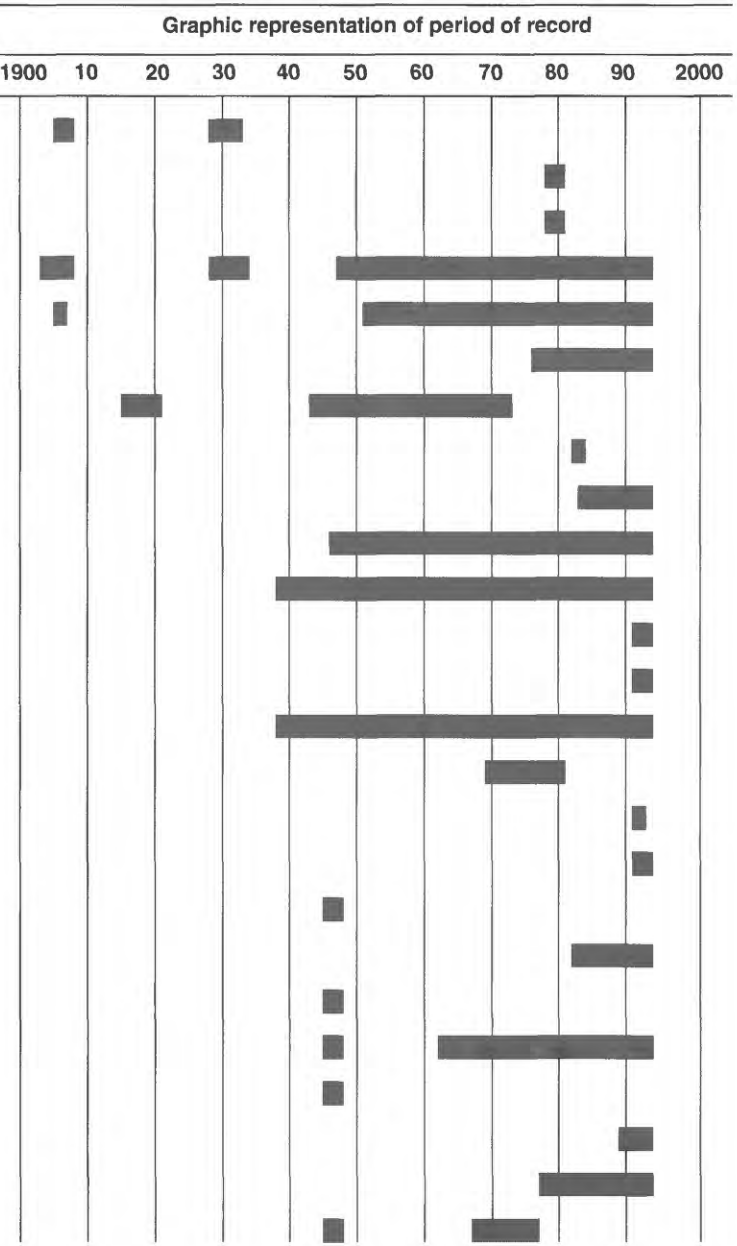


Table 1. Continuous-record streamflow-gaging stations operated in Black Hills area—Continued

Station number	Station name	Period of record through water year 1993	Graphic representation of period of record (1900, 10, 20, 30, 40, 50, 60, 70, 80, 90, 2000)
06405400	Grace Coolidge Creek near Fairburn	1978-80	
06405500	Grace Coolidge Creek near Hermosa	1945-47, 1978-80	
06405800	Bear Gulch near Hayward	1989-93	
06406000	Battle Creek at Hermosa	1903, 1949-93	
06406500	Battle Creek below Hermosa	1951-53, 1989-93	
06406920	Spring Creek above Sheridan Lake, near Keystone	1991-93	
06407000	Spring Creek near Hill City	1938-40	
06407500	Spring Creek near Keystone	1945-47, 1987-93	
06408000	Spring Creek near Rapid City	1903-06, 1945-47	
06408500	Spring Creek near Hermosa	1949-93	
06408700	Rhoads Fork near Rochford	1982-93	
06408860	Rapid Creek near Rochford	1988-93	
06409000	Castle Creek above Deerfield Reservoir, near Hill City	1948-93	
06410000	Castle Creek below Deerfield Dam	1946-93	
06410500	Rapid Creek above Pactola Reservoir, at Silver City	1954-93	
06411500	Rapid Creek below Pactola Dam	1929-32, 1946-93	
06412000	Rapid Creek at Big Bend	1915-17, 1932-43	
06412200	Rapid Creek above Victoria Creek, near Rapid City	1989-93	
06412500	Rapid Creek above Canyon Lake, near Rapid City	1946-93	
06412510	Rapid Creek above Rapid City	1991	
06412600	Cleghorn Springs main channel at Fish Hatchery, at Rapid City	1988-92	
06412700	Cleghorn Springs south channel at Fish Hatchery, at Rapid City	1988-92	
06412800	Cleghorn Springs north channel at Fish Hatchery, at Rapid City	1988-92	
06412810	Cleghorn Springs at Rapid City	1993	
06412900	Rapid Creek below Cleghorn Springs, at Rapid City	1988-93	
06413000	Bennett Ditch at Rapid City	1946-51	

Table 1. Continuous-record streamflow-gaging stations operated in Black Hills area—Continued

Station number	Station name	Period of record through water year 1993
06413200	Rapid Creek below Park Drive, at Rapid City	1988-90
06413300	Leedy Ditch at headgate below Canyon Lake Dam, at Rapid City	1988-90
06413500	Leedy Ditch at Rapid City	1946-51
06413550	Leedy Ditch at mouth at Rapid City	1988-90
06413570	Rapid Creek above Jackson Boulvard, at Rapid City	1988-90
06413650	Lime Creek at mouth, at Rapid City	1981-82, 1988-93
06413660	Storybook Ditch at headgate, at Rapid City	1988-90
06413670	Storybook Ditch at mouth, at Rapid City	1988-90
06413700	Rapid Creek above Water Treat Plant, at Rapid City	1980-82, 1988-90
06413800	Deadwood Avenue Drain at mouth, at Rapid City	1981-82, 1987-90
06414000	Rapid Creek at Rapid City	1903-07, 1942-93
06414500	Iowa Ditch at Rapid City	1946-53
06414700	Rapid Creek at East Main Street, at Rapid City	1980-82
06415000	Lockart Ditch at Rapid City	1946-53
06415500	Hawthorne Ditch at Rapid City	1946-53, 1981-82
06416000	Rapid Creek below Hawthorne Ditch, at Rapid City	1946-53, 1980-82
06416300	Meade Street Drain at Rapid City	1980
06416500	Murphy Ditch near Rapid City	1946-53
06417000	Cyclone Ditch near Rapid City	1946-53
06417500	South Side Ditch near Rapid City	1946-53
06418000	Little Giant Ditch near Rapid City	1946-53
06418500	Rapid Creek below Little Giant Ditch, near Rapid City	1946-53
06418900	Rapid Creek below Sewage Plant, near Rapid City	1982-93
06419000	Lone Tree Ditch near Rapid City	1946-53
06419500	Saint Germain Ditch at Caputa	1946-53
06420000	Rapid Creek at Caputa	1946-53

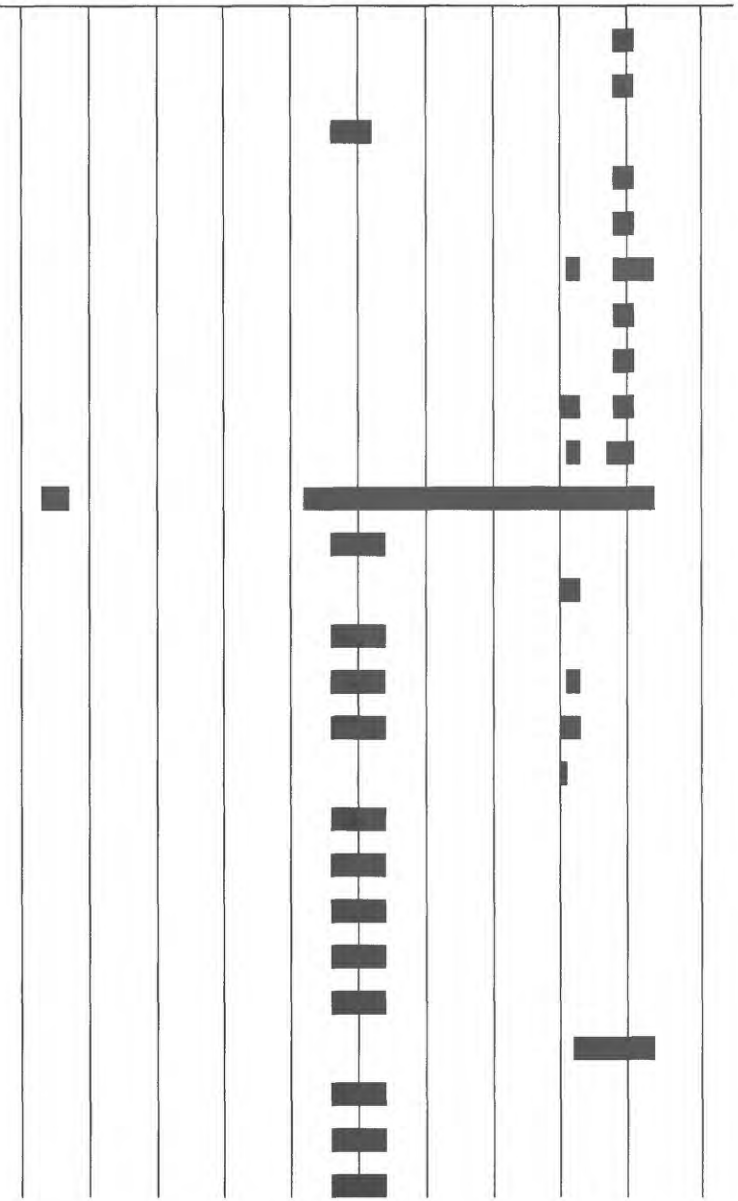


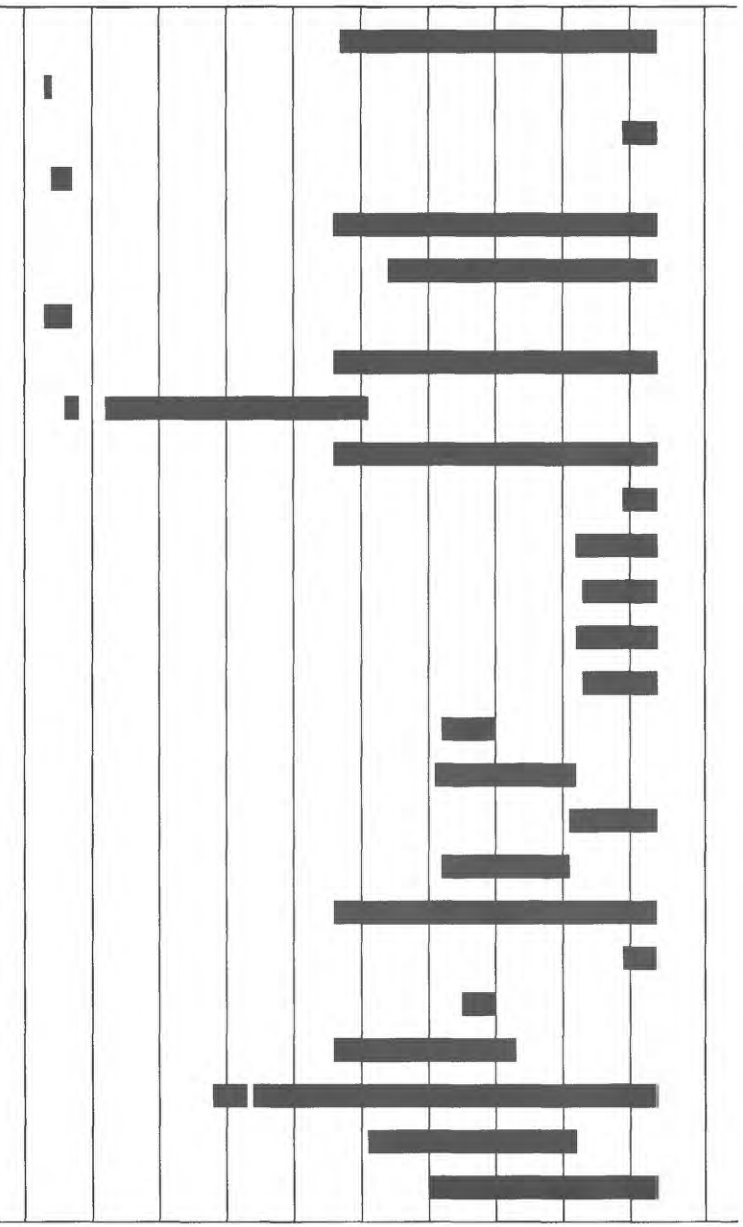
Table 1. Continuous-record streamflow-gaging stations operated in Black Hills area—Continued

Station number	Station name	Period of record through water year 1993	Graphic representation of period of record (1900, 10, 20, 30, 40, 50, 60, 70, 80, 90, 2000)
06420500	Hammerquist Ditch near Farmingdale	1946-53	
06421500	Rapid Creek near Farmingdale	1946-89, 1991-93	
06422000	Rapid Creek at Creston	1929-32, 1990	
06422398	Boxelder Creek at Nemo	1978-80	
06422500	Boxelder Creek near Nemo	1945-47, 1966-93	
06422600	Boxelder Creek at Camp Columbus, near Nemo	1978-80	
06422650	Boxelder Creek at Doty School, near Blackhawk	1978-80	
06423000	Boxelder Creek at Blackhawk	1903-06, 1945-47	
06423010	Boxelder Creek near Rapid City	1978-93	
06423500	Cheyenne River near Wasta	1914-15, 1928-32, 1934-93	
06424000	Elk Creek near Roubaix	1945-47, 1992-93	
06424500	Elk Creek above Piedmont	1945-47	
06425100	Elk Creek near Rapid City	1979-93	
06425500	Elk Creek near Elm Springs	1949-93	
06428500	Belle Fourche River at Wyoming-South Dakota State line	1947-93	
06429000	Belle Fourche River at Belle Fourche	1903-06	
06429997	Murray Ditch above headgate, at Wyoming-South Dakota State line	1987-93	
06430000	Murray Ditch at Wyoming-South Dakota State line	1954-87	
06430500	Redwater Creek at Wyoming-South Dakota State line	1929-31, 1936-37, 1954-93	
06430540	Cox Lake outlet near Beulah, WY	1991-93	
06430770	Spearfish Creek near Lead	1989-93	
06430800	Annie Creek near Lead	1989-93	
06430850	Little Spearfish Creek near Lead	1989-93	
06430898	Squaw Creek near Spearfish	1989-93	
06430900	Spearfish Creek above Spearfish	1989-93	
06431000	Spearfish Creek near Spearfish	1904-07	

Table 1. Continuous-record streamflow-gaging stations operated in Black Hills area—Continued

Station number	Station name	Period of record through water year 1993
06431500	Spearfish Creek at Spearfish	1947-93
06432000	Spearfish Creek at Toomey Ranch near Spearfish	1903
06432020	Spearfish Creek below Spearfish	1989-93
06432500	Redwater Canal at Minnesala	1904-06
06433000	Redwater River above Belle Fourche	1946-93
06433500	Hay Creek at Belle Fourche	1954-93
06434000	Redwater Creek at Belle Fourche	1903-06
06434500	Inlet Canal near Belle Fourche	1946-93
06435500	Belle Fourche River near Belle Fourche	1906-07, 1912-50
06436000	Belle Fourche River near Fruitdale	1946-93
06436156	Whitetail Creek at Lead	1989-93
06436170	Whitewood Creek at Deadwood	1982-93
06436180	Whitewood Creek above Whitewood	1983-93
06436190	Whitewood Creek near Whitewood	1982-93
06436198	Whitewood Creek above Vale	1983-93
06436500	Horse Creek near Newell	1962-69
06436700	Indian Creek near Arpan	1961-81
06436760	Horse Creek above Vale	1981-93
06436800	Horse Creek near Vale	1962-80
06437000	Belle Fourche River near Sturgis	1946-93
06437020	Bear Butte Creek near Deadwood	1989-93
06437200	Bear Butte Creek near Galena	1965-69
06437500	Bear Butte Creek near Sturgis	1946-72
06438000	Belle Fourche River near Elm Springs	1928-32, 1934-93
06438500	Cheyenne River near Plainview	1951-81
06439300	Cheyenne River at Cherry Creek	1960-93

Graphic representation of period of record



Streamflow records in this report are summarized from the first available year of record through water year 1993 (WY 1993). Different types of summaries are presented in the Supplemental Information section for each of four categories, including: (1) Stations for which only monthly records are available; (2) stations with less than 5 years of daily record; (3) stations with 5 to 9 years of daily record; and (4) stations with 10 or more years of daily record. Within each category, stations are arranged by station numbers, which increase in a downstream direction.

Streamflow records for South Dakota have been published in a variety of USGS publications. During WY 1966-93, streamflow records have been published in a series of annual, state-wide "Water Resources Data" reports for South Dakota (U.S. Geological Survey, 1967-94). During WY 1961-65, streamflow records for South Dakota were included in joint annual reports for North Dakota and South Dakota (U.S. Geological Survey, 1962-66). Prior to water year 1961, streamflow records for South Dakota were published in a series of annual USGS Water-Supply Papers that contained streamflow records for the Missouri River Basin. Streamflow records for the Missouri River Basin through WY 1970 have been summarized in a series of multi-year compilations for water years through 1950, WY 1951-60, WY 1961-65, and WY 1965-70 (U.S. Geological Survey, 1959, 1964, 1969, and 1973).

Most of the streamflow records that are summarized in this report are obtained from the USGS's computerized data base known as the Automated Data Processing System (ADAPS). ADAPS is part of the National Water Information System (NWIS), which is used by the USGS to store and process water-related data (Dempster, 1990). Various ADAPS application programs were used to develop statistical summaries of streamflow records.

Stations With Records of Only Monthly Mean Flow

Descriptions of stations for which only monthly streamflow records are available are presented in table 2. Stations located within the study area for the Black Hills Hydrology Study are shown in figure 6. Stations 06419500, 06420000, and 06420500, which

Table 2. Site information for gaging stations for which only monthly streamflow records are available

[NA, drainage area not applicable; --, drainage area undetermined]

Station number	Period of record (water years)	Station name	Area (square miles)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
06413000	1946-51	Bennett Ditch at Rapid City	NA	440330	1031640
06413500	1946-51	Leedy Ditch at Rapid City	NA	440320	1031640
06414500	1946-53	Iowa Ditch at Rapid City	NA	440500	1031200
06415000	1946-53	Lockart Ditch at Rapid City	NA	440420	1031130
06416500	1946-53	Murphy Ditch near Rapid City	NA	440340	1031000
06417000	1946-53	Cyclone Ditch near Rapid City	NA	440320	1031000
06417500	1946-53	South Side Ditch near Rapid City	NA	440240	1030800
06418000	1946-53	Little Giant Ditch near Rapid City	NA	440240	1030730
06418500	1946-51	Rapid Creek below Little Giant Ditch, near Rapid City	--	440230	1030730
06419000	1946-53	Lone Tree Ditch near Rapid City	NA	440120	1030400
06419500	1946-53	Saint Germain Ditch at Caputa	NA	435950	1025950
06420000	1946-54	Rapid Creek at Caputa	509	435920	1025940
06420500	1946-53	Hammerquist Ditch near Farmingdale	NA	435800	1025530
06429000	1903-06	Belle Fourche River at Belle Fourche	3,360	444030	1035120
06431000	1904-07	Spearfish Creek near Spearfish	157	442840	1035200
06432000	1903	Spearfish Creek at Toomey Ranch, near Spearfish	179	443310	1035230
06432500	1904-06	Redwater Canal at Minnesala	NA	443900	1034800
06434000	1903-06	Redwater Creek at Belle Fourche	1,020	444020	1035010

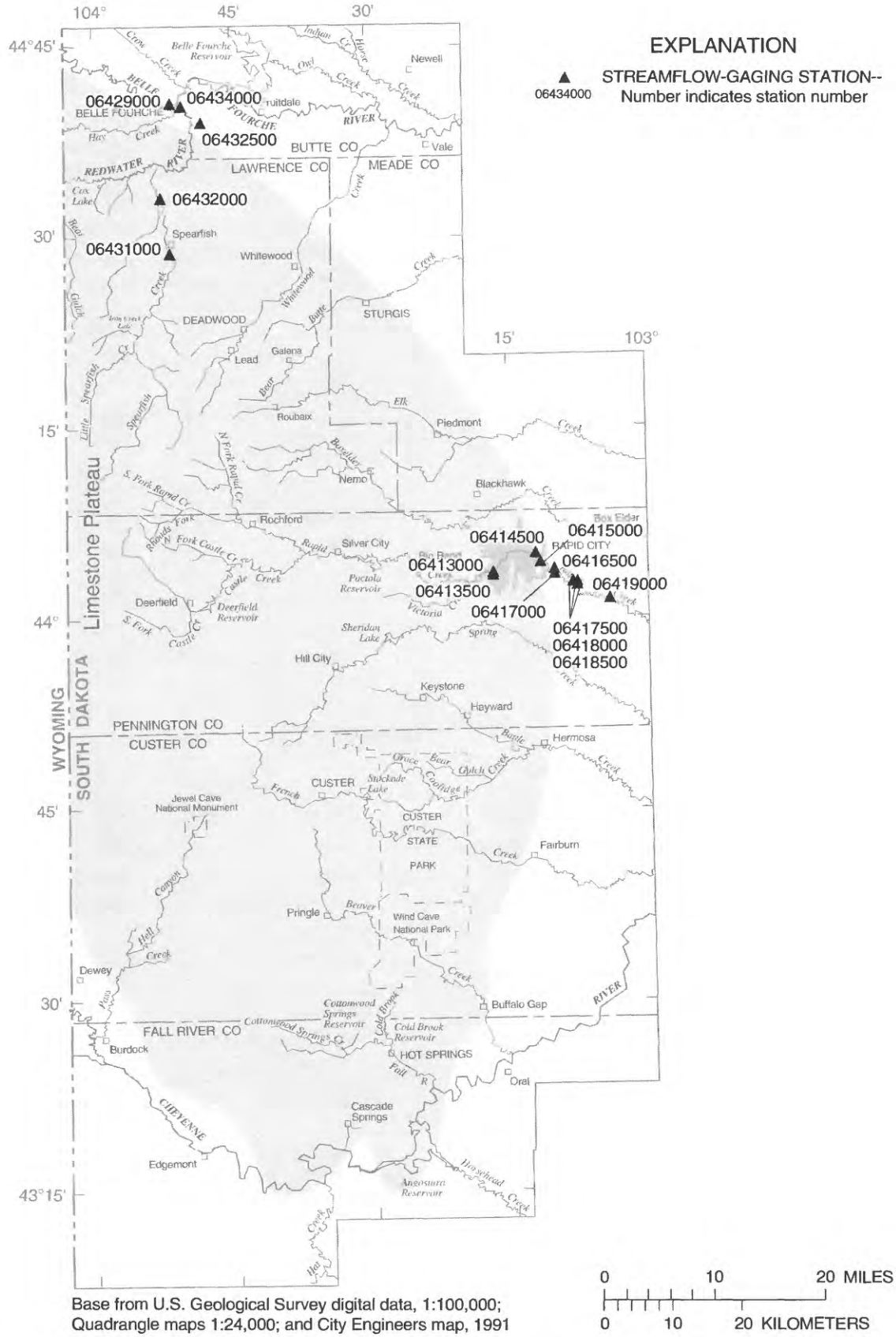


Figure 6. Location of gaging stations within study area for which only monthly records are available.

are located beyond the study area boundary, are shown in figure 1. Monthly streamflow values for these stations are summarized in Section B of the Supplemental Information section. Annual streamflow values also are presented for several stations; however, most stations were operated only on a seasonal basis. All streamflow values for these stations are presented in acre-feet. Records for several of the stations also were published as mean values in cubic feet per second in previous compilations (U.S. Geological Survey, 1959, 1964). All other streamflow records in subsequent Supplemental Information sections are presented in cubic feet per second.

Stations With Less Than 5 Years of Daily Record

Descriptions of stations with less than 5 years of daily record are presented in table 3. Stations located within the study area for the Black Hills Hydrology Study are shown in figure 7. Station 06400870, which is located beyond the study area boundary, is shown in figure 1. Monthly and annual streamflow values for these stations are summarized in Section C of the Supplemental Information section. Daily flow values for all of these stations are available in various, previous USGS publications.

Stations With 5 to 9 Years of Daily Record

Descriptions of stations with 5 to 9 years of record are presented in table 4. Stations located within the study area for the Black Hills Hydrology Study are shown in figure 8. Stations 06406500, 06422000, and 06436500, which are located beyond the study area boundary, are shown in figure 1. Monthly and annual streamflow values for these stations are presented in Section D of the Supplemental Information section. A limited set of summary statistics also is presented for most stations in Section D. Maxima, minima, and means are presented for monthly and annual values where 5 or more years of consecutive, complete record are available. In tables with sufficient record for computation of summary statistics, the period of record used for computations is shown.

Stations With 10 or More Years of Daily Record

Descriptions of stations with 10 or more years of daily record are presented in table 5. Stations located within the study area for the Black Hills Hydrology Study are shown in figure 9. Ten stations, which are located beyond the study area boundary, are shown in figure 1. A summary of tabular information for each station is presented in Section E of the Supplemental Information section. Graphical representations of variations in annual, monthly, and daily flow for each station are presented in Section F of the Supplemental Information section.

The tabular information for each station includes a table of monthly and annual mean flows for the entire period of record and five additional tables of selected summary information for a selected, consistent period of record. The summary information includes summary statistics for monthly and annual mean flows, correlation coefficients for 1-year serial correlations for monthly mean flows, correlation matrices for monthly mean flow, low-flow tables, and high-flow tables. Graphical representations include graphs of annual mean flow, distribution of monthly mean flow, a duration curve of daily mean flow, and duration hydrographs of daily mean flow for each station. More detailed descriptions of tabular and graphical information are presented in subsequent discussions.

The summary information and graphical representations generally are presented only for consecutive, complete years of hydrologically consistent record for each station. The period of record used for summary information and graphical representations is shown as the "Period of statistics record" in table 5. Using station 06400000, Hat Creek near Edgemont as an example, statistics are not computed for WY 1905-06 because of the large break in record from 1907-50 (tables E2.1-2.6).

Months of missing record are common during the first year of record for many stations or for stations that have been operated seasonally. Such years of incomplete record generally are excluded from statistical computations. Station 06400497, Cascade Springs near Hot Springs (table 5), is an example of a station for which the first year of incomplete record is excluded from statistical computations (tables E3.1-3.6). Station 06395000, Cheyenne River near Edgemont, is an example of a station with seasonal records (tables E1.1-1.6).

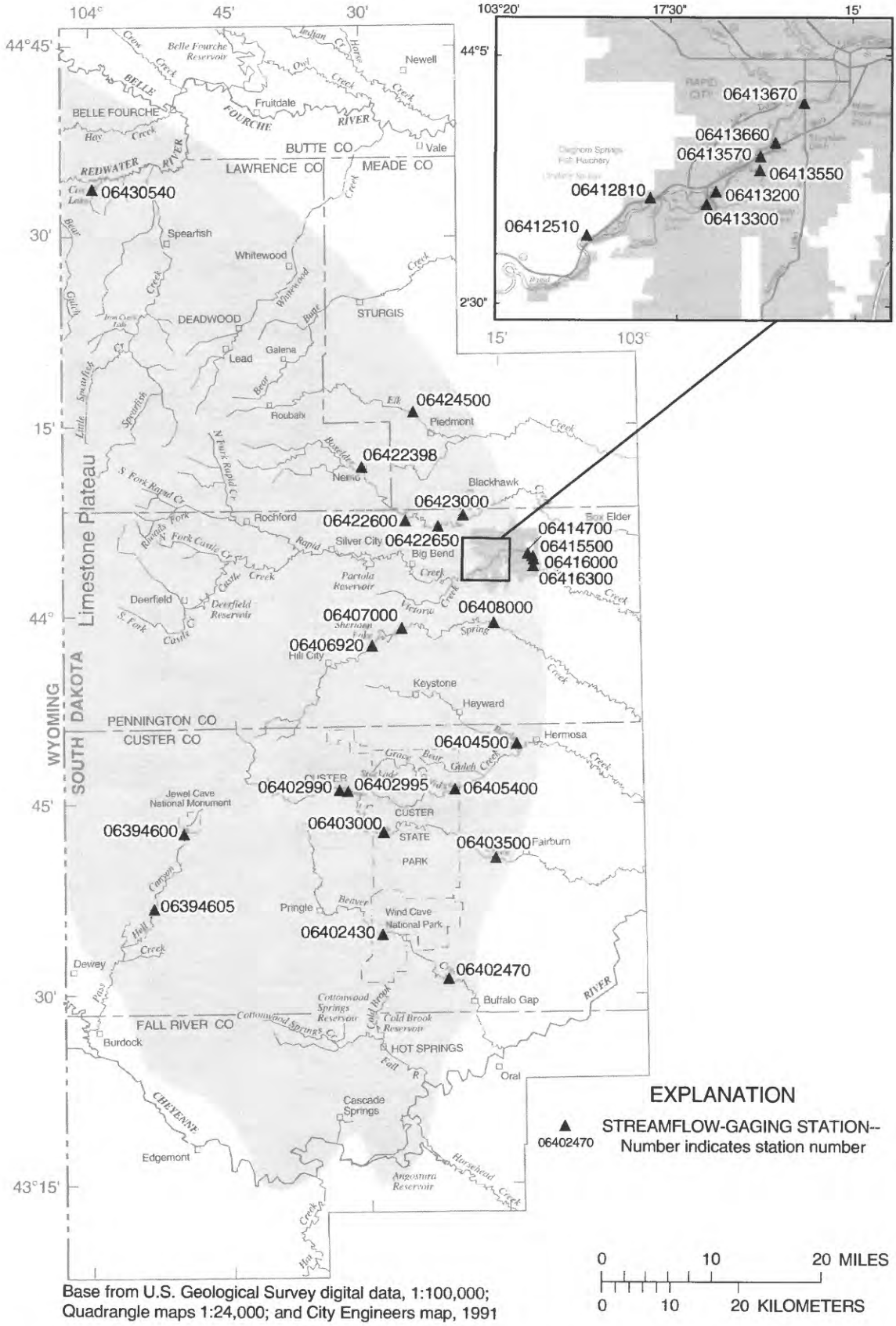
Months of missing record within a period of consistent record are uncommon. Occasional years with months of missing record within a year generally are included in statistical computations because of problems with excluding intermediate years in applications programs for statistical computations. An example is station 06402000, Fall River near Hot Springs, for which statistics are computed for WY 1939-93, in spite of 3 months of incomplete record during WY 1947 (tables E7.1-7.6).

Table 3. Site information for gaging stations with less than 5 years of daily record

[NA, drainage area not applicable; --, drainage area undetermined]

Station number	Period of record (water year)	Station name	Area (square miles)	Latitude	Longitude
				(degrees, minutes, seconds)	
06394600	1978-80	Hell Canyon near Jewel Cave, near Custer	--	434256	1035005
06394605	1978-80	Hell Canyon near Custer	--	433700	1035327
06400870	1982-83	Horsehead Creek near Oelrichs	108	430657	1031342
06402430	1991-93	Beaver Creek near Pringle	45.8	433453	1032834
06402470	1991-93	Beaver Creek above Buffalo Gap	111	433120	1032123
06402990	1991-92	French Creek below Custer	53.4	434614	1033304
06402995	1991-93	French Creek above Stockade Lake, near Custer	68.7	434610	1033210
06403000	1945-47	French Creek near Custer	98.0	434250	1032820
06403500	1945-47	French Creek near Fairburn	129	434050	1031610
06404500	1945-47	Battle Creek near Hermosa	108	434950	1031340
06405400	1978-80	Grace Coolidge Creek near Fairburn	--	434613	1032028
06406920	1991-93	Spring Creek above Sheridan Lake, near Keystone	127	435739	1032918
06407000	1938-40	Spring Creek near Hill City	142	435900	1032600
06408000	[1]1903-06, 1945-47	Spring Creek near Rapid City	171	435920	1031555
06412510	1991	Rapid Creek above Rapid City	371	440310	1031841
06412810	1993	Cleghorn Springs at Rapid City	--	440332	1031749
06413200	1988-90	Rapid Creek below Park Drive, at Rapid City	384	440333	1031702
06413300	1988-90	Leedy Ditch at headgate below Canyon Lake Dam, at Rapid City	NA	440327	1031712
06413550	1988-90	Leedy Ditch at mouth, at Rapid City	NA	440349	1031618
06413570	1988-90	Rapid Creek above Jackson Boulevard, at Rapid City	391	440355	1031621
06413660	1988-90	Storybook Ditch at headgate, at Rapid City	NA	440404	1031615
06413670	1988-90	Storybook Ditch at mouth, at Rapid City	NA	440429	1031544
06414700	1980-82	Rapid Creek at East Main Street, at Rapid City	416	440445	1031212
06415500	[1]1946-53, 1981-82	Hawthorne Ditch at Rapid City	NA	440429	1031130
06416000	[1]1946-54, 1980-82	Rapid Creek below Hawthorne Ditch, at Rapid City	418	440400	1031025
06416300	1980	Meade Street Drain at Rapid City	3.15	440351	1031132
06422398	1978-80	Boxelder Creek at Nemo	--	441148	1033014
06422600	1978-80	Boxelder Creek at Camp Columbus, near Nemo	--	440730	1032530
06422650	1978-80	Boxelder Creek at Doty School, near Blackhawk	--	440703	1032154
06423000	[1]1903-06, 1945-47	Boxelder Creek at Blackhawk	128	440750	1031910
06424500	1945-47	Elk Creek above Piedmont	49	441605	1032430
06430540	1991-93	Cox Lake outlet near Beulah, WY	0.07	443356	1035937

[1]Only monthly values available for early period.



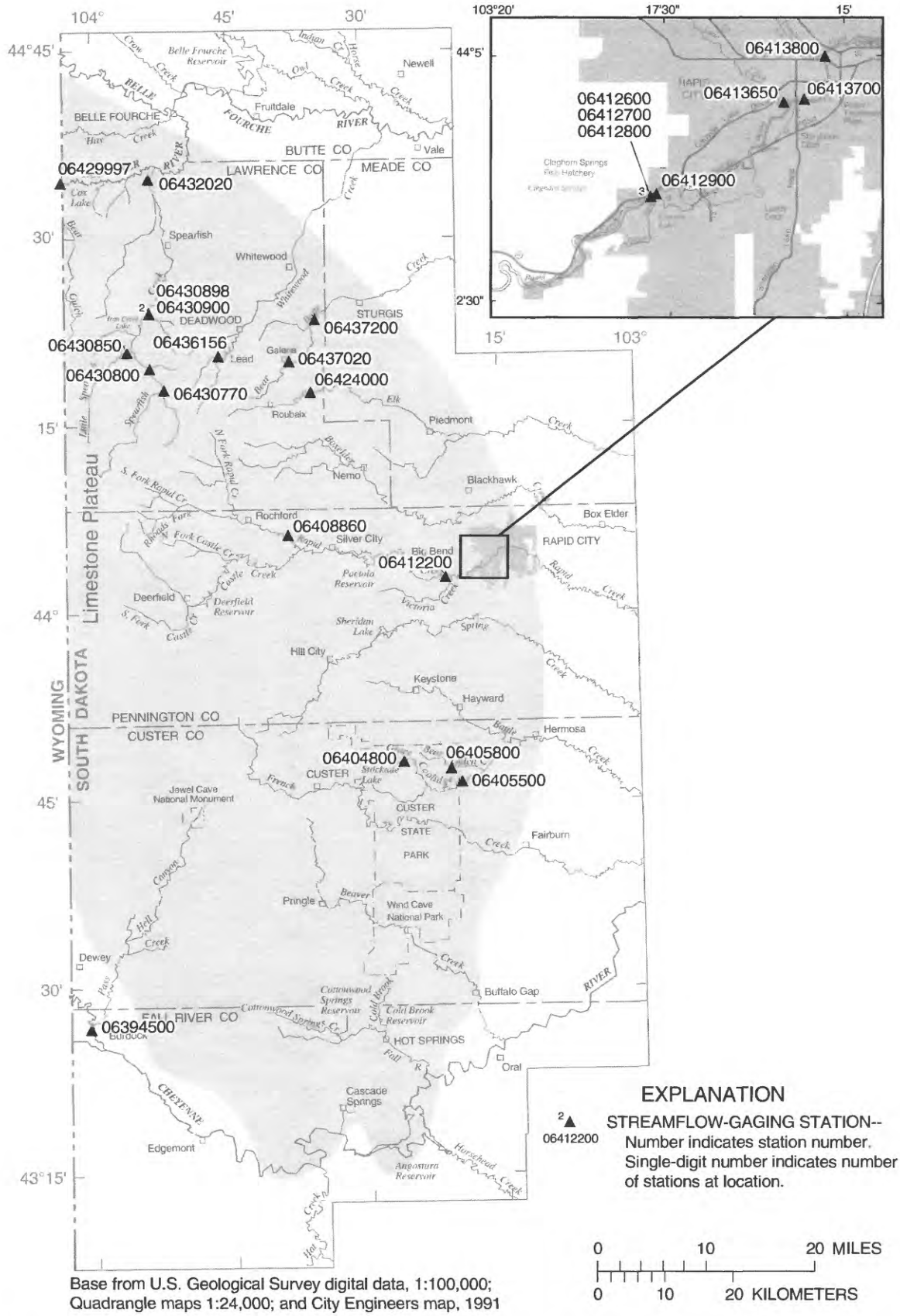
Base from U.S. Geological Survey digital data, 1:100,000; Quadrangle maps 1:24,000; and City Engineers map, 1991

Figure 7. Location of gaging stations within study area with less than 5 years of daily record.

Table 4. Site information for gaging stations with 5 to 9 years of daily record

[NA, drainage area not applicable; --, drainage area undetermined]

Station number	Period of record (water years)	Station name	Area (square miles)	Latitude	Longitude
				(degrees, minutes, seconds)	
06394500	1905-07, 1929-32	Beaver Creek near Burdock	1,540	432655	1040055
06404800	1989-93	Grace Coolidge Creek near Hayward	7.48	434807	1032603
06405500	1945-47, 1978-80	Grace Coolidge Creek near Hermosa	27.5	434629	1031942
06405800	1989-93	Bear Gulch near Hayward	4.23	434731	1032049
06406500	1951-53, 1989-93	Battle Creek below Hermosa	285	434330	1025415
06408860	1989-93	Rapid Creek near Rochford	101	440617	1033835
06412200	1988-93	Rapid Creek above Victoria Creek, near Rapid City	355	440248	1032106
06412600	1988-92	Cleghorn Springs main channel at Fish Hatchery, at Rapid City	--	440332	1031754
06412700	1988-92	Cleghorn Springs south channel at Fish Hatchery, at Rapid City	--	440331	1031756
06412800	1988-92	Cleghorn Springs north channel at Fish Hatchery, at Rapid City	--	440332	1031750
06412900	1988-93	Rapid Creek below Cleghorn Springs, at Rapid City	378	440333	1031749
06413650	1981-82, 1988-93	Lime Creek at mouth, at Rapid City	10.0	440430	1031600
06413700	1980-82, 1988-90	Rapid Creek above Water Treatment Plant, at Rapid City	404	440429	1031534
06413800	1981-82, 1987-90	Deadwood Avenue Drain at mouth, at Rapid City	2.18	440458	1031522
06422000	1929-32, 1990	Rapid Creek at Creston	710	435447	1024222
06424000	1945-47, 1992-93	Elk Creek near Roubaix	21.5	441741	1033547
06429997	1987-93	Murray Ditch above headgate at Wyoming-South Dakota State line	NA	443435	1040320
06430770	1989-93	Spearfish Creek near Lead	63.5	441756	1035202
06430800	1989-93	Annie Creek near Lead	3.55	441937	1035338
06430850	1989-93	Little Spearfish Creek near Lead	25.8	442058	1035608
06430898	1989-93	Squaw Creek near Spearfish	6.95	442404	1035335
06430900	1989-93	Spearfish Creek above Spearfish	139	442406	1035340
06432020	1989-93	Spearfish Creek below Spearfish	204	443448	1035337
06436156	1989-93	Whitetail Creek at Lead	6.15	442036	1034557
06436500	1962-69	Horse Creek near Newell	67.0	444753	1033228
06437020	1989-93	Bear Butte Creek near Deadwood	16.6	442008	1033806
06437200	1965-69	Bear Butte Creek near Galena	47.6	442332	1033511



Base from U.S. Geological Survey digital data, 1:100,000; Quadrangle maps 1:24,000; and City Engineers map, 1991

Figure 8. Location of gaging stations within study area with 5 to 9 years of daily record.

Table 5. Site information for gaging stations with 10 or more years of daily record

[NA, drainage area not applicable; --, drainage area undetermined]

Station number	Period of record (water years)	Station name	Area (square miles)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Period of statistics record (water years)
06395000	1903-07, 1928-33, 1947-93	Cheyenne River at Edgemont	7,143	431820	1034914	1947-93
06400000	1905-06, 1951-93	Hat Creek near Edgemont	1,044	431424	1033516	1951-93
06400497	1976-93	Cascade Springs near Hot Springs	0.47	432010	1033307	1977-93
06400500	1915-20, 1943-72	Cheyenne River near Hot Springs	8,710	431819	1033343	[1]1944-72
06400875	1983-93	Horsehead Creek at Oelrichs	187	431117	1031334	1984-93
06401500	1946-93	Cheyenne River below Angostura Dam	9,100	432308	1032420	1953-78
06402000	1938-93	Fall River at Hot Springs	137	432550	1032833	[1]1939-93
06402500	1938-93	Beaver Creek near Buffalo Gap	130	432800	1031820	[1]1939-93
06402600	1969-80	Cheyenne River near Buffalo Gap	9,810	433005	1030423	1969-80
06403300	1982-93	French Creek above Fairburn	105	434302	1032203	[1]1983-93
06404000	1945-47, 1962-93	Battle Creek near Keystone	66.0	435221	1032010	1962-93
06404998	1977-93	Grace Coolidge Creek near Game Lodge, near Custer	25.2	434540	1032149	1977-93
06405000	1945-47, 1967-76	Grace Coolidge Creek near Custer	25.3	434540	1032142	1968-76
06406000	[2]1903, 1949-93	Battle Creek at Hermosa	178	434941	1031144	1950-93
06407500	1945-47, 1987-93	Spring Creek near Keystone	163	435845	1032025	1987-93
06408500	1949-93	Spring Creek near Hermosa	199	435631	1030932	1950-93
06408700	1982-93	Rhoads Fork near Rochford	7.95	440812	1035129	[1]1983-93
06409000	1948-93	Castle Creek above Deerfield Reservoir, near Hill City	79.2	440049	1034948	1949-93
06410000	1946-93	Castle Creek below Deerfield Dam	96.0	440145	1034653	1948-83
06410500	1954-93	Rapid Creek above Pactola Reservoir, at Silver City	292	440505	1033448	1954-93
06411500	1929-32, 1946-93	Rapid Creek below Pactola Dam	320	440436	1032854	1964-93
06412000	1915-17, 1932-43	Rapid Creek at Big Bend	332	440400	1032400	1933-42
06412500	1946-93	Rapid Creek above Canyon Lake, near Rapid City	371	440310	1031841	1964-93
06414000	1903-07, 1942-93	Rapid Creek at Rapid City	410	440509	1031431	1964-93
06418900	1982-93	Rapid Creek below Sewage Plant, near Rapid City	452	440124	1030543	1982-93
06421500	1946-89, 1991-93	Rapid Creek near Farmingdale	602	435631	1025112	1964-93
06422500	1945-47, 1966-93	Boxelder Creek near Nemo	96.0	440838	1032716	1967-93

Table 5. Site information for gaging stations with 10 or more years of daily record—Continued

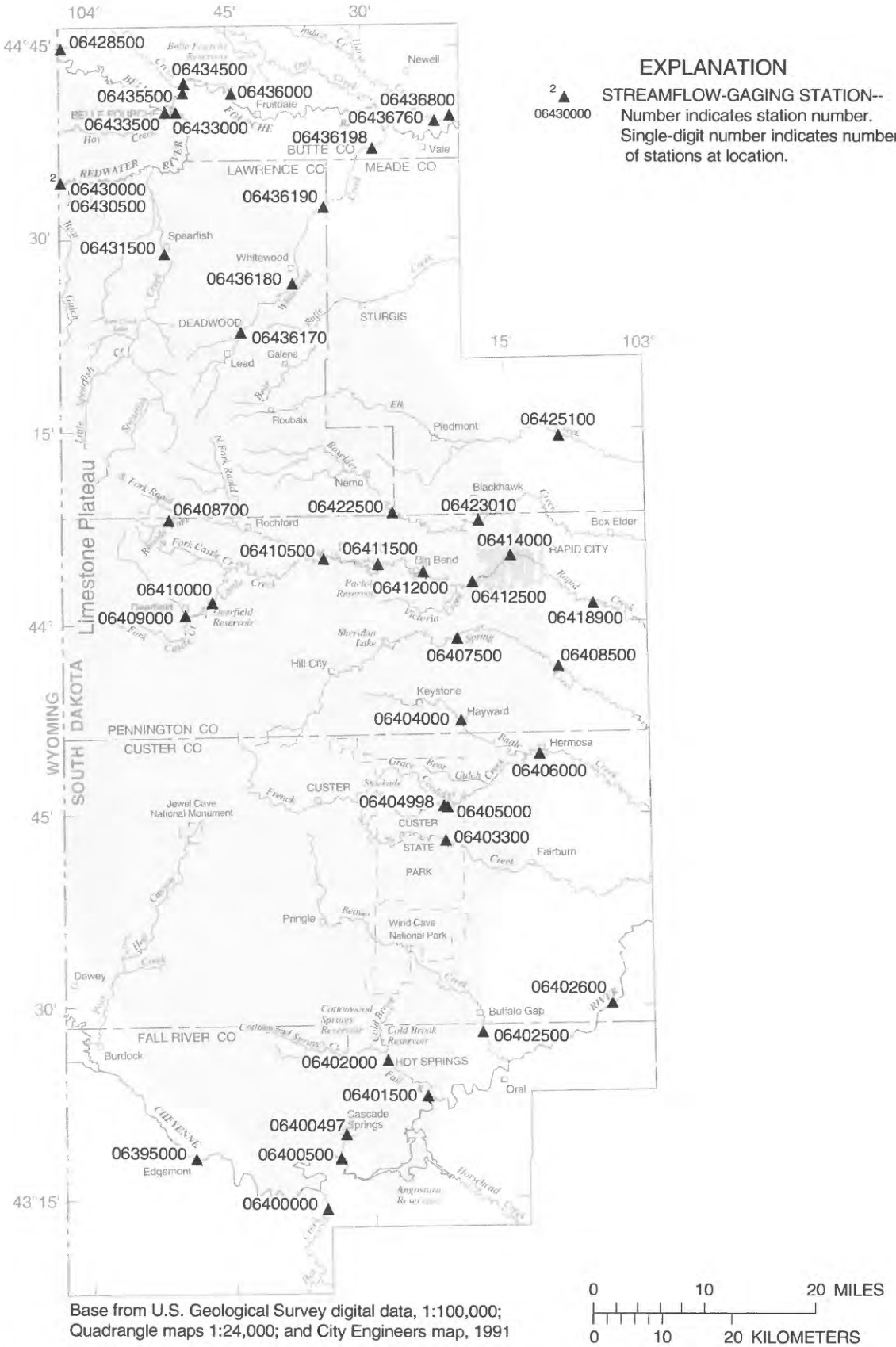
[NA, drainage area not applicable; --, drainage area undetermined]

Station number	Period of record (water years)	Station name	Area (square miles)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Period of statistics record (water years)
06423010	1978-93	Boxelder Creek near Rapid City	128	440754	1031754	1979-93
06423500	1914-15, 1928-32, 1934-93	Cheyenne River near Wasta	12,800	440452	1022403	1957-93
06425100	1979-93	Elk Creek near Rapid City	190	441425	1030903	[1]1980-93
06425500	1949-93	Elk Creek near Elm Springs	540	441454	1023010	1950-93
06428500	1947-93	Belle Fourche River at Wyoming-South Dakota State line	3,280	444459	1040249	1953-93
06430000	1954-87	Murray Ditch at Wyoming-South Dakota State line	NA	443435	1040258	1961-86
06430500	1929-31, 1936-37, 1954-93	Redwater Creek at Wyoming-South Dakota State line	471	443426	1040254	1955-93
06431500	1947-93	Spearfish Creek at Spearfish	168	442857	1035140	1947-93
06433000	1946-93	Redwater River above Belle Fourche	920	444002	1035020	1947-93
06433500	1954-93	Hay Creek at Belle Fourche	121	444001	1035046	1954-93
06434500	1946-93	Inlet Canal near Belle Fourche	NA	444214	1034923	1946-93
06435500	1906-07, [3]1912-45	Belle Fourche River near Belle Fourche	4,310	444130	1034930	1913-45
06436000	1946-93	Belle Fourche River near Fruitdale	4,540	444127	1034414	[1]1947-93
06436170	1982-93	Whitewood Creek at Deadwood	40.6	442248	1034325	1982-93
06436180	1983-93	Whitewood Creek above Whitewood	56.3	442632	1033744	[1]1984-93
06436190	1982-93	Whitewood Creek near Whitewood	77.4	443230	1033416	1982-93
06436198	1983-93	Whitewood Creek above Vale	102	443704	1032852	[1]1984-93
06436700	1961-81	Indian Creek near Arpan	315	444851	1034122	1962-81
06436760	1981-93	Horse Creek above Vale	464	443908	1032159	1981-93
06436800	1962-80	Horse Creek near Vale	530	443930	1032017	[1]1963-80
06437000	1946-93	Belle Fourche River near Sturgis	5,870	443047	1030811	[1]1947-93
06437500	1946-72	Bear Butte Creek near Sturgis	192	442835	1031550	1946-72
06438000	1928-32, 1934-93	Belle Fourche River near Elm Springs	7,210	442211	1023356	[1]1935-93
06438500	1951-81	Cheyenne River near Plainview	21,600	443116	1015934	1951-81
06439300	1960-93	Cheyenne River at Cherry Creek	23,900	443559	1012951	1961-93

[1]Low-flow statistics include previous year.

[2]Indicates only gage-height records available for 1903.

[3]Additional records for water years 1946-50, which were computed by combing records for stations 06434500 and 06436000, were published in Water Supply Paper 1309 (U.S. Geological Survey, 1959).



Base from U.S. Geological Survey digital data, 1:100,000; Quadrangle maps 1:24,000; and City Engineers map, 1991

Figure 9. Location of gaging stations within study area with 10 or more years of daily record.

For some stations, large periods of record have been excluded from statistical computations because streamflow characteristics have been altered by reservoir operations. Table 6 presents storage information for reservoirs that have changed streamflow characteristics within periods of record for gaging stations with 10 or more years of record (table 5). These reservoirs were described in a previous section titled "Reservoirs and water use." Records of monthend contents for these reservoirs (if available) are summarized in Section A of the Supplemental Information section. Monthend contents are those that have been reported by the USGS in various data reports (relative to the same capacities reported in table 6). Storage capacities have been subject to occasional changes, based on updated reservoir capacity allocations by the Bureau of Reclamation. Changes in storage capacity generally result from sedimentation or structural modifications.

Stations for which changes in reservoir operations were a major consideration in selecting periods of record for statistical computations are listed in table 7. The rationale for selection of hydrologically consistent periods of record for statistical computations also is described in table 7. Statistics generally are computed for periods subsequent to filling of reservoirs, except as discussed in the following paragraphs.

Construction of Cold Brook and Cottonwood Springs Reservoirs (table 6) altered the high-flow characteristics for station 06402000, Fall River at Hot Springs (table 7). The effects on other streamflow characteristics are unknown. The annual flow of the Fall River has declined somewhat, through the period of record (table E7.1, fig. F7A). Peterlin (1990) hypothesized that construction of the two reservoirs could be responsible for the decline; however, effects of storage within the reservoirs are minimal. Thus, with the exception of high-flow statistics, the entire period of record is used for statistical computations.

Table 6. Summary of storage information for selected large reservoirs in Black Hills area

[Storage information obtained from various U.S. Geological Survey reports and Bureau of Reclamation reservoir capacity allocations. --, undetermined or not applicable]

Station number	Station or reservoir name	Dates (in month and year) of first storage and effective filling[1]		Reported capacities[2], in acre-feet, above given invert elevation, in feet
		First storage	First filled	
06401000	Angostura Reservoir near Hot Springs	10/49	[1]06/52	A [3]136,300 B [3]122,100 C 3,139.75
06409500	Deerfield Reservoir near Hill City	12/45	[1]05/47	A 15,153 B 15,504 C 5839.0
06411000	Pactola Reservoir near Silver City	08/56	06/63	A 55,700 B 54,955 C 4,456.1
06427000	Keyhole Reservoir near Moorcroft, WY	02/52	03/72	A [3]199,900 B [3]193,027 C 4,036.0
06435000	Belle Fourche Reservoir near Belle Fourche	05/10	04/19	A 185,200 B 185,277 C 2,927.0
--	Cold Brook Reservoir	05/52	--	A [4]7,200 B -- C --
--	Cottonwood Springs Reservoir	06/69	--	A [4]8,385 B -- C --

[1]Not completely filled; however, filled to level at which typical releases were initiated.

[2]Capacities which unless otherwise noted consist of active conservation capacity at: (A) Original construction; and (B) as of water year 1993; relative to (C) invert elevation.

[3]Capacity consists of active conservation capacity and inactive capacity.

[4]Total capacity.

Table 7. Rationale for selection of statistics period for selected gaging stations

Station number	Station name	Period of record (water years)	Period of statistics record (water years)	Rationale for selection of statistics period
06401500	Cheyenne River below Angostura Dam	1946-93	1953-78	First complete water year after filling of Angostura Reservoir.
06402000	Fall River at Hot Springs	1938-93	[1]1939-93 [2]1970-93	High-flow statistics are run only for water years subsequent to completion of Cottonwood Springs Reservoir.
06410000	Castle Creek below Deerfield Dam	1946-93	1948-93	First complete water year after filling of Deerfield Reservoir.
06411500	Rapid Creek below Pactola Dam	1929-32 1946-93	1964-93	First complete water year after filling of Pactola Reservoir.
06412500	Rapid Creek above Canyon Lake	1946-93	1964-93	First complete water year after filling of Pactola Reservoir.
06414000	Rapid Creek at Rapid City	1903-07 1942-93	1964-93	First complete water year after filling of Pactola Reservoir.
06421500	Rapid Creek near Farmingdale	1946-89 1991-93	1964-93	First complete water year after filling of Pactola Reservoir.
06423500	Cheyenne River near Wasta	1914-15 1928-32 1934-93	1957-93	First complete water year after first storage in Pactola Reservoir.
06428500	Belle Fourche River at WY-SD State line	1947-93	1953-93	First complete water year after first storage in Keyhole Reservoir.
06435500	Belle Fourche River near Belle Fourche	1906-07 [3]1912-45	1913-45	First complete water year of record.

[1]Period of record for majority of statistics; low-flow statistics include previous year.
[2]Period of record for high-flow statistics.
[3]Additional records for water years 1946-50, which were computed by combing records for stations 06434500 and 06436000, were published in Water Supply Paper 1309 (U.S. Geological Survey, 1959).

Statistics for most stations downstream from Deerfield and Pactola Reservoirs are computed for periods subsequent to filling of the reservoirs (table 7). The statistics period selected for station 06423500, Cheyenne River near Wasta, begins with WY 1957, which is the first year of storage in Pactola Reservoir. Operations of Pactola Reservoir do affect streamflow of the Cheyenne River; however, effects of initially filling storage in Pactola Reservoir are small, relative to annual flow of the Cheyenne River.

Keyhole Reservoir has affected streamflow of the Belle Fourche River since storage began in February 1952; however, Keyhole Reservoir has been full only during March 1972 (table 6) and during 1978 (table A4). Because normal operating levels are much less than capacity, the first complete year of storage (WY 1953) is used for the beginning of the statistics period for station 06428500, Belle Fourche River at Wyoming-South Dakota State line.

Belle Fourche Reservoir has affected streamflow of the Belle Fourche River since storage began in May 1910 (table 6). The reservoir did not fill until April 1919; however, storage during 1913 was larger than in many subsequent years (table A5). Thus, WY 1913 is used as the beginning of the statistics period for station 06435500, Belle Fourche River near Belle Fourche.

Six tables are presented in Section E of the Supplemental Information section for each station having a sufficient period of record. The first table of each series for each station contains monthly and annual mean values for the entire period of available record. The following five tables of each series are for a selected, hydrologically consistent period of record.

The second table in each series presents statistics for monthly and annual mean flow for the selected statistics period. This table includes the total number of months used in the analysis; the maximum; 75th, 50th, and 25th percentiles; minimum; mean; standard deviation; skewness; and coefficient of variation for

each column; and the percent of annual flow contributed by each month. This table also presents a serial correlation for annual flows, which is a correlation coefficient for a series comparing annual flow from one year to the next. The correlation coefficient is a measure of the strength of the linear relationship between the dependent and independent variable (Ott, 1988). Coefficients approaching zero represent a very weak correlation and correlations approaching +1 or -1 represent a strong positive or negative correlation.

The third table presents a serial correlation matrix for monthly flows lagged by 1 year. The fourth table of each series presents a correlation matrix for monthly mean flow. This matrix contains a correlation coefficient for each month, relative to monthly flow for other months.

The fifth table of each series presents the lowest mean flow and ranking, by year, for 1, 3, 7, 14, 30, 60, 90, 120, and 183 consecutive-day periods. A low-flow water year from April 1 to March 31 is used for the low-flow table. Thus, low-flow water year 1992 (April 1, 1992-March 31, 1993) is the last year reported in the low-flow tables. In addition, the low-flow statistics period for some stations includes a partial first year of record, which is excluded from other statistical computations. Such cases are footnoted in table 5. Station 0640200, Fall River at Hot Springs, is an example (tables E7.1-7.6). The final table of each series presents a high-flow table, which uses the standard water year (October 1-September 30).

Section F of the Supplemental Information section presents graphical representations of variations in annual, monthly, and daily mean flow for each station. Each figure contains four graphs labeled A, B, C, and D. Graphs for station 06400000, Hat Creek near Edgemont (table 5), are described as an example (fig. F2). Graph A shows annual mean flow values for the entire period of record, with the occasional exception of stations such as this, with short periods of record that are highly separated from the statistics period. Graph B shows the distribution of monthly mean flows in the form of boxplots. For October, the maximum monthly flow of record is 13.0 ft^3/s. Ninety percent of the October means are less than 4.12 ft^3/s, 75 percent are less than 1.00 ft^3/s, and 50 percent are less than 0.077 ft^3/s. The 25th percentile, 10th percentile, and the minimum are not shown because values of 0.00 cannot be plotted on a logarithmic scale. Graph C shows the duration curve of daily mean flow. For the example station, daily flow exceeds 0.25 ft^3/s 50 percent of the time, and flow exceeds 0.01 ft^3/s about 63 percent of the time. Graph D shows duration hydrographs of daily mean flow for five exceedance percentiles. For the example station, 20 percent of the time flow exceeds about 1.20 ft^3/s for the first day of November, and flow of less than 0.01 ft^3/s has been recorded for all days of the year.

STREAMFLOW CHARACTERISTICS FOR SELECTED BASINS

Streamflow within the study area is affected by both topography and geology. The base flow of most Black Hills streams originates in the higher elevations, where relatively large precipitation and small evapotranspiration result in more water being available for springflow and streamflow. Numerous streams have significant headwater springs originating from large outcrops of Paleozoic rocks (fig. 3) on the western side of the study area (fig. 4), which is known locally as the "Limestone Plateau" (fig. 2). Several streams, most notably Rapid Creek and Spearfish Creek, derive consistent base flow from large headwater springs on the eastern fringe of the Limestone Plateau. By comparison, stream reaches originating within the central Precambrian core of the Hills are more responsive to precipitation, with high flows during wet periods and low flows during dry periods (Addison, 1991). Most Black Hills streams generally lose all or part of their flow as they cross the outcrop of the Madison Limestone (Driscoll, 1994; Rahn and Gries, 1973). Karst features of the Madison Limestone, including sinkholes, collapse features, solution cavities, and caves are responsible for the Madison's capacity to accept recharge from streamflow. Large streamflow losses also occur within the outcrop of the Minnelusa Formation in many locations. A number of large artesian springs exist downgradient from streamflow-loss zones, most commonly within outcrops of the Spearfish Formation, near the contact with the Minnekahta Limestone. Artesian springs with discharges ranging from about 1 to 30 ft^3/s are common, providing an important source of base flow in many streams beyond the periphery of the Black Hills (Rahn and Gries, 1973).

The following sections present summaries of streamflow characteristics for streams grouped according to various hydrogeologic settings. Various analyses are presented to demonstrate the effects of hydrogeologic setting and climate on streamflow characteristics.

Methods for Categorizing Basins

A system for categorizing the hydrogeologic setting and degree of regulation of streams draining the Black Hills area is presented in table 8. Table 8 includes all gaging stations in the Black Hills area with 10 or more years of record, as well as several stations with less than 10 years of record, which are included because they provide important information in critical areas. The hydrogeologic settings for three categories are determined on the basis of geologic conditions within the drainage basins upstream of the gaging stations; however, a fourth category is based on locations of gaging stations, as described in a subsequent discussion. Stations that are categorized as having multiple hydrogeologic settings generally are excluded from subsequent analyses. Stations that are classified as highly regulated, in any of three categories, also are excluded from analyses. Locations of selected stations, relative to selected outcrops, are shown in figure 10.

Methods for categorizing the hydrogeologic setting for each station (table 8) are somewhat subjective. The drainage basin for each gaging station is first categorized as either interior or exterior. Interior basins are located predominantly within the uplifted Black Hills area, which is defined for this purpose as within the generalized, outermost extent of the outcrop of the Inyan Kara Group (fig. 10). Exterior basins are those for which the majority of the drainage area lies beyond the outer extent of the outcrop of the Inyan Kara Group. Basins are categorized as both interior and exterior if a predominant drainage area is not apparent. For example, station 06400500, Cheyenne River near Hot Springs (fig. 9), is categorized as both interior and exterior, and thus, is excluded from subsequent analyses. In comparison, station 06395000, Cheyenne River at Edgemont (fig. 10), also has tributaries draining both interior and exterior areas; however, influence from the interior area is relatively minor and the station is categorized as exterior. Station 06437500, Bear Butte Creek near Sturgis, is the only station categorized as both interior and exterior that is included in subsequent analyses.

Interior basins are further categorized as either upstream or downstream of loss zones. This category is less subjective, and is based strictly on whether a gaging station is located upstream, or downstream, of streamflow-loss zones that typically occur within outcrops of the Madison Limestone (fig. 10) and other overlying sedimentary units. Station 06405000, Grace Coolidge Creek near Custer, was determined to be located within a loss zone, and was subsequently replaced by station 06404998, Grace Coolidge Creek near Game Lodge, which is located just upstream of the original station. Thus, this station is categorized as upstream of a loss zone, but is not used in subsequent analyses. Station 06431500, Spearfish Creek at Spearfish, is located downstream of a loss zone, but flow is diverted around the loss zone. Thus, this station is categorized as upstream of the loss zone and is included in subsequent analyses. With these exceptions, all other interior basins are categorized as either upstream or downstream of a loss zone. Several stations categorized as downstream of loss zones are located beyond the outer extent of the outcrop of the Inyan Kara Group, but have only small percentages of their drainage areas within the exterior area.

Interior basins upstream of loss zones are further categorized as either sedimentary or crystalline, based on the predominant outcrops within each basin. The interior sedimentary basins are dominated by outcrops of Paleozoic units (fig. 3), and are located within headwater areas of the Limestone Plateau (fig. 10). The interior crystalline basins are dominated by outcrops of metamorphic or igneous rocks, most of which are crystalline, and are located within the central core of the Black Hills. This category also can include Tertiary intrusive rocks. Some subjectivity is involved because few basins are located entirely within outcrops of sedimentary or crystalline rocks. Basins are categorized as both sedimentary and crystalline if a predominant outcrop type is not apparent.

Stations also are categorized relative to the degree of regulation (high, medium, low, or negligible) from reservoir operations, irrigation diversions, and municipal and industrial diversions within each basin (table 8). Highly regulated basins are excluded from subsequent analyses of streamflow characteristics, because streamflow may no longer be representative of geologic conditions. Methods for categorizing the degree of regulation are somewhat subjective, but are based on the degree to which streamflow characteristics for each stream are affected by regulation. General criteria for categorizing the degree of regulation are presented in table 9.

Streamflow characteristics for numerous stations along Rapid Creek and the Belle Fourche and Cheyenne Rivers are highly affected (table 8) by operations of several major reservoirs that are described in previous sections. Station 06402000, Fall River at Hot Springs, is categorized as having medium regulation

Table 8. Hydrogeologic setting and degree of regulation for selected long-term gaging stations (generally those with 10 or more years of record)

[Interior, majority of drainage area within Black Hills; exterior, majority of drainage area outside Black Hills; sed, predominantly sedimentary; cry, predominantly crystalline. Degrees of regulation: H, high; M, medium; L, low; N, negligible or none]

Station number[1]	Station name	Hydrogeologic setting				Degree of regulation											
		Interior			Exterior	Reservoir operation				Irrigation diversion				Municipal and industrial diversions			
		Upstream of loss zone		Down-stream of loss zone													
		Sed	Cry			H	M	L	N	H	M	L	N	H	M	L	N
06395000	Cheyenne River at Edgemont				X			X				X					X
06400000	Hat Creek near Edgemont				X			X				X					X
06400497	Cascade Springs near Hot Springs			X					X				X				X
06400500	Cheyenne River near Hot Springs			X	X			X				X					X
06400875	Horsehead Creek at Oelrichs				X			X				X					X
06401500	Cheyenne River below Angostura Dam			X	X	X				X							X
06402000	Fall River at Hot Springs			X			X						X			X	
06402500	Beaver Creek near Buffalo Gap			X					X		X						X
06402600	Cheyenne River near Buffalo Gap			X	X	X				X							X
06403300	French Creek above Fairburn		X				X						X		X		
06404000	Battle Creek near Keystone		X						X				X			X	
06404998	Grace Coolidge Creek near Game Lodge, near Custer		X					X					X				X
06405000	Grace Coolidge Creek near Custer		[2]X					X					X				X
06406000	Battle Creek at Hermosa			X					X		X					X	
06407500	Spring Creek near Keystone		X				X						X			X	
06408500	Spring Creek near Hermosa			X			X					X					X
06408700	Rhoads Fork near Rochford	X							X				X				X
06409000	Castle Creek above Deerfield Reservoir, near Hill City	X							X				X				X
06410000	Castle Creek below Deerfield Dam	X				X							X				X
06410500	Rapid Creek above Pactola Reservoir, at Silver City	X	X			X							X			X	
06411500	Rapid Creek below Pactola Dam	X	X			X							X			X	
06412000	Rapid Creek at Big Bend	X	X						X				X			X	
06412500	Rapid Creek above Canyon Lake, near Rapid City			X		X							X			X	
06414000	Rapid Creek at Rapid City			X		X						X		X			
06418900	Rapid Creek below Sewage Plant, near Rapid City			X		X				X					X		

Table 8. Hydrogeologic setting and degree of regulation for selected long-term gaging stations (generally those with 10 or more years of record)—Continued

[Interior, majority of drainage area within Black Hills; exterior, majority of drainage area outside Black Hills; sed, predominantly sedimentary; cry, predominantly crystalline. Degrees of regulation: H, high; M, medium; L, low; N, negligible or none]

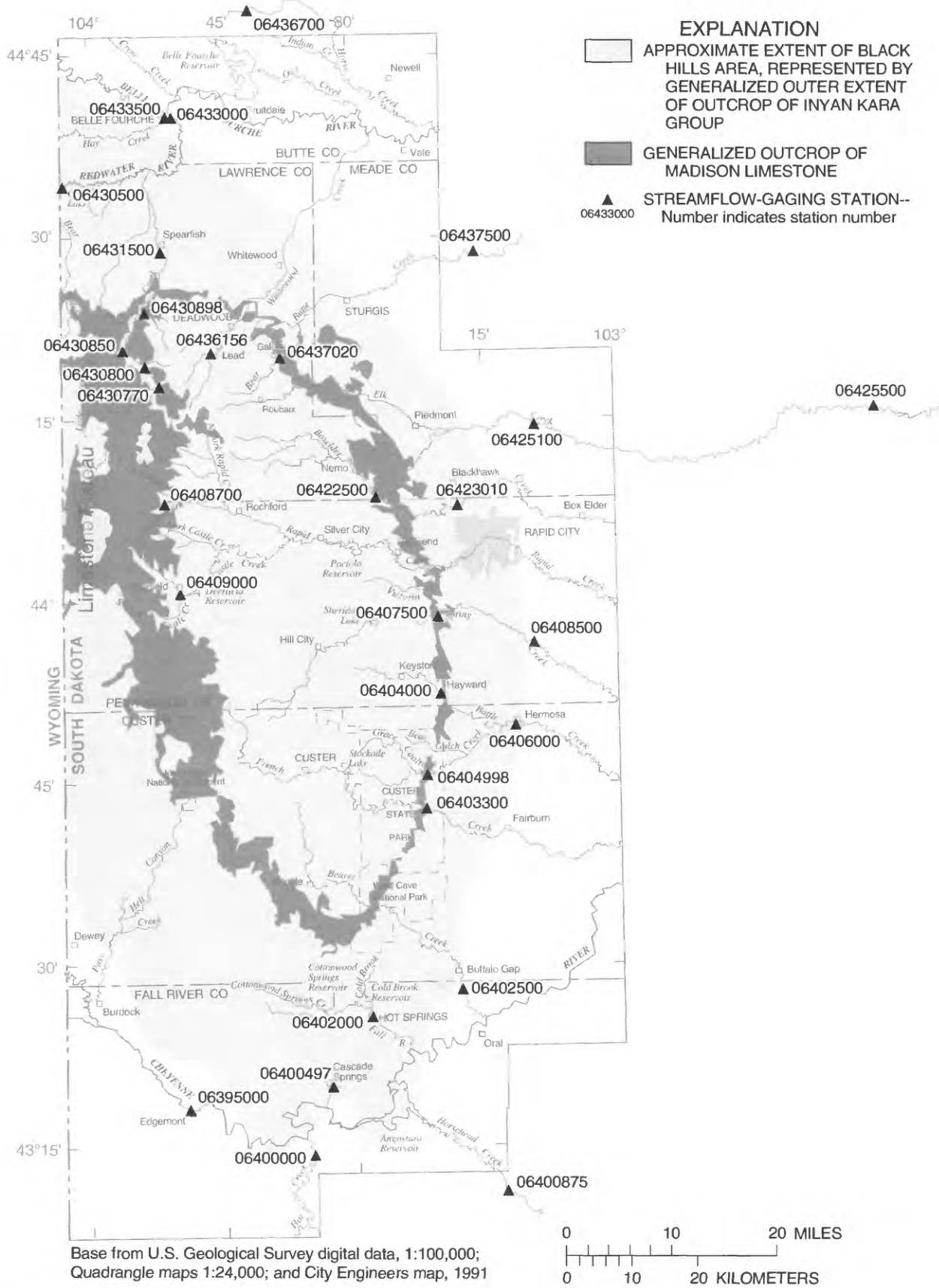
Station number[1]	Station name	Hydrogeologic setting				Degree of regulation											
		Interior			Exterior	Reservoir operation				Irrigation diversion				Municipal and industrial diversions			
		Upstream of loss zone		Down-stream of loss zone													
		Sed	Cry			H	M	L	N	H	M	L	N	H	M	L	N
06421500	Rapid Creek near Farmingdale			X		X				X					X		
06422500	Boxelder Creek near Nemo		X						X				X				X
06423010	Boxelder Creek near Rapid City			X					X				X				X
06423500	Cheyenne River near Wasta			X	X	X				X						X	
06425100	Elk Creek near Rapid City			X				X				X				X	
06425500	Elk Creek near Elm Springs				X			X				X				X	
06428500	Belle Fourche River at Wyo.-S. Dak. State line			X	X	X					X						X
06430000	Murray Ditch at Wyo.-S. Dak. State line			X					X	X							X
06430500	Redwater Creek at Wyo.-S. Dak. State line			X				X			X						X
[3]06430770	Spearfish Creek near Lead	X							X				X		X		
[3]06430800	Annie Creek near Lead		X						X				X				X
[3]06430850	Little Spearfish Creek near Lead	X							X				X				X
[3]06430898	Squaw Creek near Spearfish		X						X				X				X
06431500	Spearfish Creek at Spearfish	[4]X							X				X		X		
06433000	Redwater River above Belle Fourche			X				X			X					X	
06433500	Hay Creek at Belle Fourche				X			X				X				X	
06434500	Inlet Canal near Belle Fourche			X	X	X				X						X	
06435500	Belle Fourche River near Belle Fourche			X	X	X				X						X	
06436000	Belle Fourche River near Fruitdale			X	X	X				X						X	
[3]06436156	Whitetail Creek at Lead		X						X				X				X
06436170	Whitewood Creek at Deadwood	X	X						X				X	X			
06436180	Whitewood Creek above Whitewood			X					X				X	X			
06436190	Whitewood Creek near Whitewood			X					X			X		X			
06436198	Whitewood Creek above Vale			X				X				X		X			
06436700	Indian Creek near Arpan				X			X				X					X

Table 8. Hydrogeologic setting and degree of regulation for selected long-term gaging stations (generally those with 10 or more years of record)—Continued

[Interior, majority of drainage area within Black Hills; exterior, majority of drainage area outside Black Hills; sed, predominantly sedimentary; cry, predominantly crystalline. Degrees of regulation: H, high; M, medium; L, low; N, negligible or none]

Station number[1]	Station name	Hydrogeologic setting				Degree of regulation											
		Interior			Exterior	Reservoir operation				Irrigation diversion				Municipal and industrial diversions			
		Upstream of loss zone		Down-stream of loss zone													
		Sed	Cry			H	M	L	N	H	M	L	N	H	M	L	N
06436760	Horse Creek above Vale				X	X				X							X
06436800	Horse Creek near Vale				X	X				X							X
06437000	Belle Fourche River near Sturgis			X	X	X				X						X	
[3]06437020	Bear Butte Creek near Deadwood		X						X				X				X
06437500	Bear Butte Creek near Sturgis			X	X			X				X				X	
06438000	Belle Fourche River near Elm Springs			X	X	X				X							X
06438500	Cheyenne River near Plainview			X	X	X				X							X
06439300	Cheyenne River at Cherry Creek			X	X	X				X							X

[1]Stations that are used for analyses are shaded.
[2]Station is categorized as upstream of loss zone, although station actually was located within loss zone; replaced with station 06404998 during October 1976.
[3]Station with less than ten years of record.
[4]Station located downstream of the loss zone; however, baseflow is diverted around the loss zone. Thus, station is treated as being upstream of loss zone.



Base from U.S. Geological Survey digital data, 1:100,000; Quadrangle maps 1:24,000; and City Engineers map, 1991

Figure 10. Location of selected gaging stations relative to selected geologic outcrops.

Table 9. Criteria for categorizing degree of regulation for Black Hills streams

Category	Criteria for assigning category
High	Streamflow measurably affected by regulation majority of time and most streamflow characteristics highly affected majority of time
Medium	Streamflow is measurably affected by regulation; however, many streamflow characteristics are not highly affected
Low	Streamflow is seldom measurably affected by regulation or most streamflow characteristics seldom affected
Negligible	Effects of regulation are nonexistent, or nearly nonexistent

because of two flood-storage reservoirs in the basin (Cold Brook and Cottonwood Springs Reservoirs), which primarily affect high-flow statistics. Stations 06403300, French Creek above Fairburn, 06407500, Spring Creek near Keystone, and 06408500, Spring Creek near Hermosa, also are categorized as having medium regulation because of occasional releases from upstream reservoirs, with potential to affect monthly streamflow values. Releases from Stockade Lake on French Creek, and Sheridan Lake on Spring Creek are increased for short periods (generally less than 1 month) during some years, in an effort to provide flow through downstream loss zones. Basins with small, pass-through reservoirs and large numbers of small stock dams generally are categorized as having low regulation because effects on most streamflow characteristics generally are small. Basins with few small dams or reservoirs are categorized as having negligible regulation.

Most stations that are highly regulated by reservoir operations also are highly affected by irrigation diversions. In addition, two stations along Horse Creek (stations 06436760 and 06436800) are highly affected by irrigation return flows originating from diversions from the Belle Fourche Reservoir. Several stations are categorized as having medium regulation because streamflow characteristics can be utilized for comparisons, in spite of sizeable irrigation withdrawals. Numerous stations are categorized as having low regulation from irrigation diversions. In most of these cases, irrigation methods are limited to spreader systems that are operational only during high flows or to small pumps.

Most effects from municipal or industrial diversions are small, relative to flow of affected streams. During low-flow conditions, municipal diversions by the City of Rapid City can be large, relative to the flow of Rapid Creek. Diversions by Homestake Mining Company from Rapid Creek, Elk Creek, and Spearfish Creek are categorized as low to medium; however, return flows to Whitewood Creek, subsequent to municipal and industrial usage, are categorized as high, relative to the natural flow of Whitewood Creek. Other basins are categorized as having negligible to medium regulation, depending on sizes of communities and relative effects of community water and wastewater systems on streamflow.

Comparison of Streamflow Characteristics for Selected Hydrogeologic Settings

Comparison statistics are presented in table 10 for selected stations in four categories of hydrogeologic settings, including interior sedimentary basins, interior crystalline basins, interior basins downstream of loss zones, and exterior basins. Stations for which comparison statistics are presented were selected from table 8 by generally excluding basins that have multiple hydrogeologic settings and highly regulated basins for which natural streamflow characteristics cannot be determined. Comparison statistics include: the coefficient of variation for annual flows; the ratio of minimum to maximum annual flow; the ratio of minimum to maximum mean monthly flow; the ratio of minimum to maximum monthly flow; and the annual yield, expressed in inches (per unit area). Most of the data for calculation of comparison statistics were taken from Section E of the Supplemental Information section, which presents summary statistics for stations with 10 or more years of record. Data for stations with less than 10 years of record were obtained from Section D of the Supplemental Information section. Readers are cautioned that comparison statistics presented in table 10 are based on various periods of record, which are not consistent from station to station.

The comparison statistics presented in table 10 provide numerous insights regarding the variability of streamflow in different hydrogeologic settings. The first statistic considered is the coefficient of variation for annual flows, which is a measure of the variability in annual mean flows over the period of record. A small value for this coefficient indicates low variability from one year to the next and a large value indicates high variability.

Table 10. Comparison statistics for selected stations with various hydrogeologic settings

[--, not computed]

Station number	Station name	Area (square miles)	Period of record (water years)	Coefficient of variation for annual flow	Annual minimum/ maximum ratio	Mean monthly minimum/ maximum ratio	Monthly minimum/ maximum ratio	Annual yield (inches)
			Interior sedimentary basins					
06408700	Rhoads Fork near Rochford	7.95	1983-93	0.22	0.531	0.912	0.420	8.51
06409000	Castle Creek above Deerfield Reservoir, near Hill City	79.2	1949-93	.25	.304	.507	.079	1.83
06430770	Spearfish Creek near Lead	63.5	1989-93	.10	.785	.622	.383	3.34
06430850	Little Spearfish Creek near Lead	25.8	1989-93	.04	.893	.843	.643	6.90
06431500	Spearfish Creek at Spearfish[1]	168	1947-93	.25	.321	.407	.045	4.13
			Mean	.17	.567	.658	.314	4.94
			Median	.22	.531	.622	.383	4.13
			Interior crystalline basins					
06403300	French Creek above Fairburn	105	1983-93	.62	.074	.070	.003	.84
06404000	Battle Creek near Keystone	66.0	1962-93	.70	.033	.028	.000	1.70
06404998	Grace Coolidge Creek near Game Lodge, near Custer	25.2	1977-93	.70	.067	.082	.000	1.94
06407500	Spring Creek near Keystone	163	1987-93	.96	.035	.041	.000	1.12
06422500	Boxelder Creek near Nemo	96.0	1967-93	.73	.069	.077	.002	2.17
06430800	Annie Creek near Lead	3.55	1989-93	.38	.309	.023	.000	3.10
06430898	Squaw Creek near Spearfish	6.95	1989-93	.37	.315	.041	.025	4.07
06436156	Whitetail Creek at Lead	6.15	1989-93	.25	.493	.081	.036	5.59
06437020	Bear Butte Creek near Deadwood	16.6	1989-93	.55	.301	.046	.006	3.77
			Mean	.58	.188	.062	.008	2.70
			Median	.62	.074	.070	.002	2.17
			Interior basins downstream of loss zones					
06400497	Cascade Springs near Hot Springs	.47	1977-93	.07	.762	.955	.589	567
06402000	Fall River at Hot Springs	137	1939-93	.13	.661	.947	.369	2.39
06402500	Beaver Creek near Buffalo Gap	130	1939-93	.21	.341	.363 [2].920	.009 [2].270	.73
06406000	Battle Creek at Hermosa	178	1950-93	.79	.037	.086	.001	.70

Table 10. Comparison statistics for selected stations with various hydrogeologic settings—Continued

[--, not computed]

Station number	Station name	Area (square miles)	Period of record (water years)	Coefficient of variation for annual flow	Annual minimum/ maximum ratio	Mean monthly minimum/ maximum ratio	Monthly minimum/ maximum ratio	Annual yield (inches)
			Interior basins downstream of loss zones—Continued					
06408500	Spring Creek near Hermosa	199	1950-93	1.45	0.000	0.027	0.000	0.33
06423010	Boxelder Creek near Rapid City	128	1979-93	1.75	.000	.000	.000	.10
06425100	Elk Creek near Rapid City	190	1980-93	1.06	.000	.034	.000	.34
06430500	Redwater Creek at Wyoming-South Dakota State line	471	1955-93	.28	.320	.421 [2].935	.048 [2].351	.94
06433000	Redwater River above Belle Fourche	920	1947-93	.31	.262	.174 [2].854	.002 [2].256	1.91
06437500	Bear Butte Creek near Sturgis[3]	192	1946-72	1.06	.000	.030	.000	.99
			Mean	--	--	--	--	--
			Median	--	--	--	--	--
			Exterior basins					
06395000	Cheyenne River at Edgemont[4]	7,143	1947-93	.94	.028	.024	.000	.16
06400000	Hat Creek near Edgemont	1,044	1951-93	1.20	.001	.013	.000	.22
06400875	Horsehead Creek at Oelrichs	187	1984-93	1.41	.000	[5].000	.000	.58
06425500	Elk Creek near Elm Springs[4]	540	1950-93	1.05	.000	.010	.000	.53
06433500	Hay Creek at Belle Fourche	121	1954-93	1.00	.002	.017	.000	.16
06436700	Indian Creek near Arpan	315	1962-81	1.07	.003	.001	.000	.86
06437500	Bear Butte Creek near Sturgis[3]	192	1946-72	1.06	.000	.030	.000	.99
			Mean	1.10	.006	.011	.000	.50
			Median	1.06	.002	.012	.000	.53

[1]Station is located downstream of loss zone; however, streamflow characteristics are most representative of "interior sedimentary" basins.
[2]Ratio calculated using only the period from December through March.
[3]Streamflow characteristics are representative of both "loss-zone" and "exterior" basins.
[4]Small percentage of drainage area is within "interior" of Black Hills; however, streamflow characteristics are most representative of "exterior" basins.
[5]Actual value is 0.0003.

Coefficients of variation for annual flow, by hydrogeologic setting, are presented in graph A of figure 11. The interior sedimentary basins, which are dominated by springflow from headwater areas of the Limestone Plateau (fig. 10), have the smallest variability in annual flow, as a group. The coefficient of variation is less than or equal to 0.25 for all interior sedimentary basins (table 10). The exterior basins, as a group, have the largest variability in annual flow, with all coefficients of variation for this group approaching or exceeding 1.0. Coefficients of variation for the interior crystalline basins generally fall midway between the interior sedimentary and exterior basins, with slight overlap at each end of the range. In comparison, the interior basins downstream of loss zones (loss-zone basins) span the widest range of variability in annual flow. At the lower end of the range, variability in annual flow for loss-zone basins is comparable to variability for the interior sedimentary basins that are dominated by springflow. At the higher end of the range, variability in annual flow for loss-zone basins is comparable to variability for the exterior basins.

The wide range of variability in flow characteristics for loss-zone basins justifies further discussion of factors influencing the variability. The stations representative of loss-zone basins generally have two commonalities. First, stream channels at some point upstream of the gaging stations generally are dry during low-flow periods, or experience substantial losses during high-flow periods, in crossing outcrops of the Madison Limestone and other sedimentary units. The only exception is station 06400497, Cascade Springs near Hot Springs, which is downgradient from the Madison outcrop, but has no loss zone in its small (0.47 mi^2) drainage basin. Several streams have multiple tributaries that experience losses. The second commonality is that all of the loss-zone basins have perennial or ephemeral springs between the loss zones and gaging stations. Station 06423010, Boxelder Creek near Rapid City, is somewhat of an exception. Several springs occur within the loss zone of Boxelder Creek (Rahn and Gries, 1973); however, springflow seldom occurs between the loss zone and the gaging station. Several streams have multiple tributaries with springs.

Additional factors that influence streamflow variability in loss-zone basins are the sizes of drainage basins and the range of hydrogeologic conditions existing upstream and downstream of the loss zones. In some cases, loss-zone basins can be subjected to all of the factors that influence variability in the three other hydrogeologic settings, in addition to variability introduced by streamflow losses. Basins with large, consistent, perennial springs, and minor influence from loss zones or from tributary inflow downstream of loss zones, are likely to have the least variability in annual flow. Cascade Springs is an example. Basins with small, inconsistent, ephemeral springs, and large influence from loss zones or from tributary inflow downstream of loss zones, are likely to have the largest variability in annual flow. Battle, Spring, Boxelder, Elk, and Bear Butte Creeks are examples. Bear Butte Creek (station 06437500) is treated as both a loss-zone and exterior basin.

Mean and median values are calculated for the coefficient of variation, for each category of hydrogeologic setting, with the exception of the loss-zone basins (table 10). Means and medians are not calculated for any of the comparison statistics for loss-zone basins, because this category includes at least three distinctly different populations: (1) Those which are dominated by loss-zone characteristics; (2) those which are dominated by springflow characteristics; and (3) those which are dominated by a blend of these characteristics.

The second statistic presented in table 10 is the ratio of the minimum annual flow to the maximum annual flow for each station. The "annual minimum/maximum ratio" is shown by hydrogeologic setting in graph B of figure 11. This ratio provides information that is similar to the coefficient of variation; however, the two statistics generally are inversely proportional. The annual ratios tend to increase with decreasing variability, so springflow-dominated streams with relatively constant discharge tend to have relatively large ratios. Thus, the interior sedimentary basins and those loss-zone basins that are dominated by consistent springflow tend to have the largest ratios. The annual minimum/maximum ratios are more sensitive than the coefficients of variation, to the extremities of the range of annual values for each station. As an example, two of the interior crystalline basins (stations 06403300, French Creek above Fairburn, and 06437020, Bear Butte Creek near Deadwood) have very similar coefficients of variation of 0.62 and 0.55, respectively; however, the annual ratio for French Creek (0.074) is much smaller than for Bear Butte Creek (0.301). In addition, stations at which zero-flow has been recorded for an entire water year are readily identified by a ratio of 0.0.

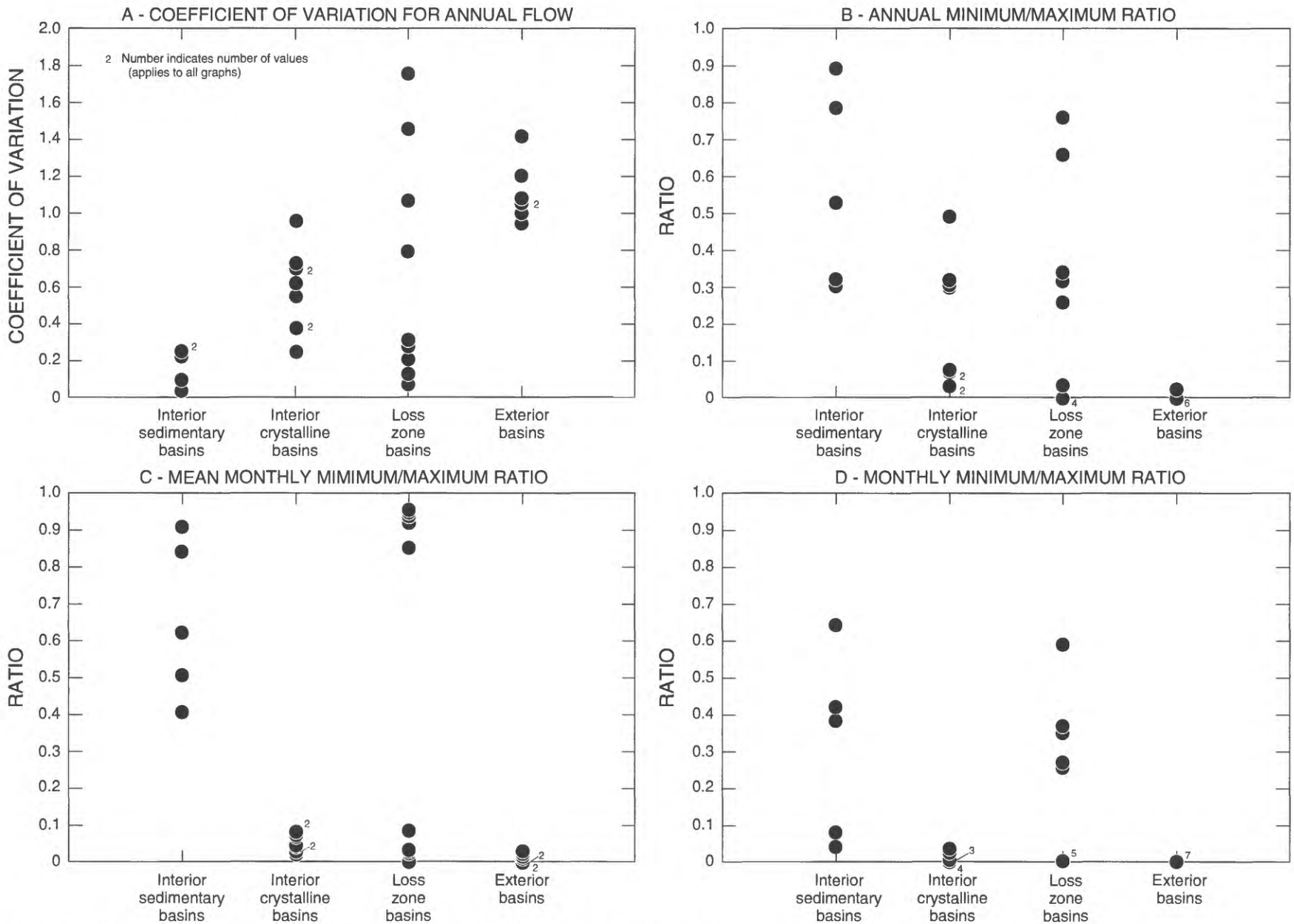


Figure 11. Distribution of streamflow variability for selected gaging stations in selected hydrogeologic settings (see table 10 for data).

Two different ratios involving monthly values are presented in table 10. These ratios also are shown, by hydrogeologic setting, in graphs C and D of figure 11. The "mean monthly minimum/maximum ratio" is obtained by comparing only the 12 mean monthly values for each station, and calculating the ratio of the smallest mean to the largest mean. The "monthly minimum/maximum ratio" is obtained by comparing all monthly values for the period of record for each station, and calculating the ratio of the smallest month to the largest month. Thus, the monthly minimum/maximum ratio for a station will be 0.0 if a zero-flow month has ever been recorded; however, the mean monthly minimum/maximum ratio will be 0.0 only if flow has never been recorded during a given month. Station 06423010, Boxelder Creek near Rapid City, which is a loss-zone station, is the only station which fits this category. Flow has never been recorded at this station for the months of October through March, for the entire period of record.

Several of the loss-zone basins included in table 10 are subject to considerable variability as a result of moderate to large irrigation withdrawals. The natural variability for stations 06402500, Beaver Creek near Buffalo Gap, 06430500, Redwater Creek at Wyoming-South Dakota State line, and 06433000, Redwater River above Belle Fourche, is much less than indicated by the coefficient of variation and the annual minimum/maximum ratio. It is not possible to alter these statistics to better reflect the natural variability of these streams; however, comparison statistics for the monthly ratios for these stations have been modified to reduce effects caused by irrigation diversions. For these stations, the monthly ratios also are calculated using only the months of December through March (table 10), which provides a much better indication of the small, natural variability in monthly streamflow for these springflow-dominated streams. The monthly ratios shown in figure 11, for these stations, are the modified ratios.

The annual yield for each station, which is calculated by dividing mean annual flow by drainage area and converting to inches, also is shown in table 10. Annual yields are calculated using the periods of record shown in table 10; thus, annual yields are not representative of any consistent period of record. Annual yields for several stations actually are somewhat larger than shown in table 10. Relatively large flows are diverted from upper Spearfish Creek to Whitewood Creek. Thus, actual annual yields are larger than indicated for stations 06430770, Spearfish Creek near Lead, and 06431500, Spearfish Creek at Spearfish. Irrigation diversions reduce the calculated annual yields for many of the loss-zone basins and exterior basins.

Annual yields for all stations except loss-zone stations, which may not be representative of annual yield for the drainage areas, are shown in figure 12. Annual yields generally increase from south to north, with the largest yields generally occurring in streams draining the higher elevations of the northern Black Hills. This is consistent with precipitation patterns for the Black Hills area.

Two effects of geologic conditions on annual yield are readily identifiable for several of the loss-zone basins. One effect is the reduction in yield that results from streamflow losses. For example, annual yield is reduced from 2.17 in. at station 06422500, Boxelder Creek near Nemo, to 0.10 in. at station 06423010, Boxelder Creek near Rapid City (table 10). Another effect can be identified for loss-zone basins that are dominated by springflow, which can produce flow originating from outside the surface drainage area, as evidenced by annual yields for two stations. The annual yield of 567 in. for station 06400497, Cascade Springs near Hot Springs, is at least two orders of magnitude larger than what would be expected for drainages in the southern Black Hills. The annual yield of 2.4 in. for station 06402000, Fall River at Hot Springs, also is somewhat larger than for other interior or exterior basins in the southern Black Hills.

Contributing subsurface areas for the springflow-dominated interior sedimentary basins also may be different than the surface drainages. Stations 06408700, Rhoads Fork near Rochford, and 06409000, Castle Creek above Deerfield Reservoir, are located relatively close together, with many hydrogeologic and climatic similarities. The differences in annual yields for these two stations (8.5 and 1.8 in., respectively) are much larger than would be expected as a result of climatic differences. It is likely that the contributing subsurface and surface drainage areas do not coincide, for one or both of these basins.

The effects of geologic conditions on annual yield in other hydrogeologic settings are more difficult to assess, because it is difficult to separate effects of geologic conditions from effects of climatic conditions. Annual yields for the two categories of interior basins (sedimentary and crystalline) generally are larger than for exterior basins (table 10, fig. 12); however, wetter climatic conditions within the interior Black Hills area

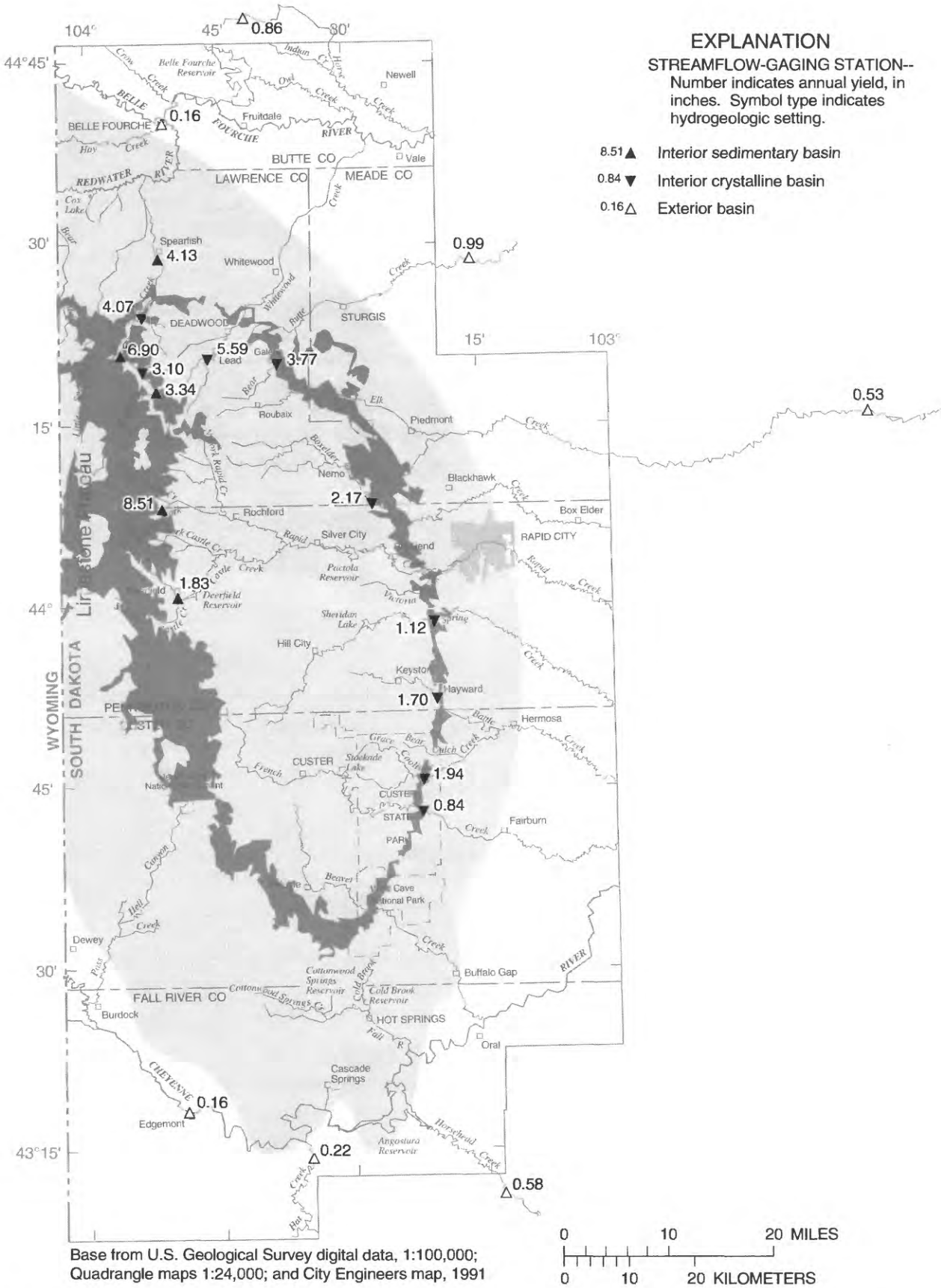


Figure 12. Distribution of annual yield for gaging stations representative of selected hydrogeologic settings.

probably are at least partially responsible for the larger yields. Annual yields for the interior sedimentary basins are larger, as a group, than for the interior crystalline basins; however, annual yields for interior crystalline basins located in the northern Black Hills are comparable with yields for the interior sedimentary basins, all of which are located in the northern Black Hills (fig. 12). Thus, it cannot necessarily be concluded that the interior sedimentary basins produce higher yields than crystalline basins.

Factors Affecting Streamflow Variability

A number of factors have been identified that affect variability of streamflow in the Black Hills area. Variations in climatic conditions have the potential to affect the timing and amount of streamflow in any given location. Annual yield is shown to generally increase from south to north and also is shown to be larger for interior sedimentary basins and interior crystalline basins, than for exterior basins. These variations in annual yield are consistent with climatic patterns for the Black Hills area, including: (1) Increasing precipitation from south to north; (2) increasing precipitation with increasing elevation; and (3) decreasing evapotranspiration rates with increasing elevation. Thus, in many cases, potential effects of geologic conditions on annual yield are difficult to separate from effects of climatic patterns.

Geologic conditions are shown to have a large effect on the annual and monthly variability of streamflow. Interior crystalline basins and exterior basins are shown to have large variations in annual and monthly flows. All of the exterior basins are prone to extended periods of zero flow, as indicated by the monthly minimum/maximum ratios, which are 0.0 for all exterior basins, and by the annual minimum/maximum ratios, which approach 0.0 for all exterior basins (table 10). Although interior crystalline basins exhibit large variability in annual and monthly flows, these basins are somewhat less prone to extended periods of zero flow. Zero-flow months have been recorded for about one-half of the crystalline basins, but zero-flow years have not been recorded for any of the crystalline basins listed in table 10. Larger precipitation and smaller evapotranspiration rates over the interior of the Black Hills probably are factors that decrease zero-flow periods, relative to exterior basins. In addition, it is possible that interior crystalline basins have larger shallow storage capacity than exterior basins, because of geologic factors such as fracturing.

Streams that are dominated by consistent springflow are shown to be relatively unresponsive to short-term variations in climatic conditions. As a group, the interior sedimentary basins exhibit the smallest variability in streamflow because of geologic constraints on both low and high flows. These basins derive large and consistent base flow from headwater areas of the Limestone Plateau, in the northwestern Black Hills, where most of the outcrops consist of the Madison Limestone and Minnelusa Formation. Direct surface runoff from these highly permeable outcrops is uncommon. As an example, the maximum daily flow for station 06408700, Rhoads Fork near Rochford, is 8.50 ft^3/s (table E17.6, fig. F17), which is less than twice the average flow of 4.98 ft^3/s (table E17.2), and less than three times the minimum daily flow of 3.10 ft^3/s (table E17.5).

Loss-zone basins that are dominated by large artesian springflow also have small variability in flow. An example is station 06400497, Cascade Springs near Hot Springs, where the maximum daily flow of 25 ft^3/s (table E3.6) is less than twice the minimum daily flow of 14 ft^3/s (table E3.5). Other springflow-dominated streams such as the Fall River, Beaver Creek, and the Redwater River also have small variability in springflow; however, the variability of measured streamflow is increased by effects of surface runoff and withdrawals. The source for many of the larger, more consistent artesian springs generally is discharge from the Madison and/or Minnelusa aquifers (Klemp, 1995; Whalen, 1994).

Several of the other streams that have been classified as loss-zone basins (Battle, Spring, Elk, and Bear Butte Creeks) have relatively small springs with large variability in flow characteristics. These streams are prone to low- or zero-flow conditions during extended dry periods, which indicates that these smaller springs are more responsive to short-term climatic and recharge conditions than some of the larger, more consistent springs. Additional variability in streamflow at these stations is caused by occasional large flows through the loss zones and by tributary inflow from intervening drainage areas between the loss zones and gaging locations.

Station 06423010, Boxelder Creek near Rapid City, has less influence from springflow than the other loss-zone stations. Several springs occur within the loss zone of Boxelder Creek (Rahn and Gries, 1973);

however, measurable flow at the gaging station generally occurs only when flow is sufficient to pass through the loss zone. The drainage area between the next station upstream (06422500, Boxelder Creek near Nemo) and this station increases by 32 mi^2. Much of this area consists of relatively large expanses of the Madison Limestone, Minnelusa Formation, and other sedimentary units. Examination of streamflow records for these stations (tables E27.1 and E28.1) indicates that monthly mean flow at the downstream station never exceeded corresponding flow at the upstream station during WY 1978-93. The largest daily flow for this period of record at the downstream site (114 ft^3/s on June 7, 1991) is smaller than the daily flow at the upstream site for the same date (151 ft^3/s). This provides additional evidence of the infrequent occurrence of direct surface runoff from the Madison Limestone and Minnelusa Formation.

Streamflow variability also can be affected, to some degree, by drainage area. Streamflow variability for the interior sedimentary basins can be increased by outcrops of crystalline rocks. Similarly, variability for the crystalline basins can be decreased by outcrops of sedimentary rocks. As a generality, larger drainages have more opportunity for integrated effects from multiple hydrogeologic settings. As an example, station 06431500, Spearfish Creek at Spearfish, is classified as an interior sedimentary basin (table 10). Variability for this station is larger than for two upstream stations that also are classified as interior sedimentary basins (stations 06430770, Spearfish Creek near Lead, and 06430850, Little Spearfish Creek near Lead). Part of the increased variability is a result of crystalline-rock outcrops within the basin. Two stations within the Spearfish Creek drainage (06430800, Annie Creek near Lead, and 06430898, Squaw Creek near Spearfish) are classified as predominantly crystalline; however, these basins have smaller variability than some of the other crystalline basins because of sedimentary-rock outcrops within their drainages.

SUMMARY AND CONCLUSIONS

This report summarizes streamflow records for all USGS gaging stations that have been operated within, or immediately downstream from the Black Hills of western South Dakota. In addition, streamflow characteristics are described for four categories of hydrogeologic settings that are identified for the area.

Streamflow records through WY 1993 are summarized for 129 continuous-record gaging stations. Collection of streamflow records in the Black Hills area began during WY 1903, with the operation of eight USGS gaging stations. The longest continuous records in the Black Hills area are for stations 06423500, Cheyenne River near Wasta, and 06438000, Belle Fourche River near Elm Springs, which span WY 1934-93. Monthly and annual means are tabulated for all available years of record for all 129 gaging stations, including 111 stations for which records of daily flow are available and 18 stations for which only monthly records are available. For the stations with records of daily flow, 32 have less than 5 years of record, 27 have between 5 and 9 years of record, and 52 have 10 or more years of record. Maxima, minima, and means for the monthly and annual values are summarized for the 27 stations with 5 to 9 years of record. For the 52 stations with 10 or more years of record, extensive summary information is presented in a series of six tables for each station. The first table of each series presents monthly and annual values for the station and the second table presents extensive summary statistics for these values. The third and fourth tables present correlation coefficients for 1-year serial correlations for monthly values and a correlation matrix for monthly mean flows. The fifth and sixth tables of each series present low- and high-flow values and rankings for 1, 3, 7, 14, 30, 60, 90, 120, and 183 consecutive-day periods. A series of four graphs also is presented for each station with 10 or more years of record, including graphs of annual mean flow, distribution of monthly mean flow, a duration curve of daily mean flow, and duration hydrographs of daily mean flow. In addition to streamflow summaries, records of monthend contents are presented for five reservoirs operated by the Bureau of Reclamation in the Black Hills area.

Streamflow characteristics are described for four categories of hydrogeologic settings that are identified for the Black Hills area. Stations with long-term records (generally 10 or more years) and with minimal effects from reservoir operations, irrigation diversions, and municipal and industrial diversions, are used to examine the effects of the various hydrogeologic settings on streamflow variability.

The four categories of hydrogeologic settings that are identified are interior sedimentary basins, interior crystalline basins, interior basins downstream of loss zones (loss-zone basins), and exterior basins. The interior basins are located predominantly within

the outermost extent of the outcrop of the Inyan Kara Group and the exterior basins are located predominantly beyond this outcrop. The interior sedimentary basins generally are located within headwater areas of the Limestone Plateau and are dominated by outcrops of the Madison Limestone and Minnelusa Formation. The interior crystalline basins are located within the uplifted central core of the Black Hills and are dominated by Precambrian metamorphic and igneous rocks or Tertiary intrusive rocks. The loss-zone basins generally have gaging stations located downstream of loss zones that occur where streams cross outcrops of the Madison Limestone and other overlying sedimentary units. Most of the loss-zone basins have springs located upstream of the gaging stations, but downstream of the loss zones.

Distinct differences in variability of annual and monthly streamflow are identified for the four categories of hydrogeologic settings. The interior sedimentary basins, which are dominated by springflow from headwater areas of the Limestone Plateau, have the smallest variability in both annual and monthly flow, as a group. The exterior basins, as a group, have the largest variability in both annual and monthly flow. Variability in annual and monthly flow for the interior crystalline basins generally falls midway between the interior sedimentary and exterior basins. Variability for the interior crystalline basins generally decreases as the areal extent of sedimentary-rock outcrops within a basin increases. Conversely, outcrops of crystalline rocks within interior sedimentary basins tend to increase streamflow variability. Loss-zone basins exhibit the widest range in streamflow variability of any of the categories. Flow at several of the loss-zone stations is dominated by flow from large, artesian springs, with very little variability in flow. Cascade Springs, Fall River, Beaver Creek, and Redwater River demonstrate the most consistent springflow within this category. Flow at other loss-zone stations is dominated by streamflow losses or by tributary inflows between the loss zones and the gaging stations. Variability in flow at such stations can be larger than for interior sedimentary or exterior basins. The variability caused by streamflow losses or tributary inflows for such stations tends to mask the natural variability in springflow at such stations; however, it is shown that springflow in Battle, Spring, Elk, and Bear Butte Creeks is much more variable than in Cascade Springs, Fall River, Beaver Creek, and Redwater River.

Relations between climatic conditions and streamflow are not quantified in this report; however, it is shown that the interior crystalline basins and exterior basins are much more responsive to climatic conditions than the springflow-dominated basins. Zero-flow months have been recorded for all of the exterior basins and most of the interior crystalline basins; however, zero-flow months have not been recorded for any of the interior sedimentary basins. Zero-flow months have not been recorded for the loss-zone stations with large, consistent springflow; however, zero-flow months are common for loss-zone stations with smaller, less consistent springs. Thus, it is concluded that the smaller, less consistent springs are more responsive to short-term climatic and recharge conditions than the larger, more consistent springs.

Direct surface runoff is demonstrated to be uncommon for outcrops of the Madison Limestone and Minnelusa Formation. For station 06408700, Rhoads Fork near Rochford (drainage area equals 7.95 mi^2), the ratio of maximum to mean daily flow is less than 2.0 and the ratio of maximum to minimum daily flow is less than 3.0. The drainage area between stations 06422500, Boxelder Creek near Nemo, and 06423010, Boxelder Creek near Rapid, increases by 32 mi^2, with large outcrops of the Madison Limestone and Minnelusa Formation; however, monthly and daily flow at the downstream station (06423010) have not exceeded corresponding flow at the upstream station during WY 1978-93.

Annual streamflow generally increases from south to north, which is consistent with climatic patterns for the area. Annual yield generally is larger for all of the interior categories than for the exterior basins; however, this is consistent with larger precipitation and smaller evapotranspiration rates at higher elevations. Annual yields generally are largest for the interior sedimentary basins; however, all of these basins are located in the northern Black Hills. Interior crystalline basins located in the northern Black Hills have annual yields that are comparable with interior sedimentary basins.

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SUPPLEMENTAL INFORMATION

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Section A - Tables of monthend contents for selected reservoirs

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Table A1. Monthend contents[1], in acre-feet, for station 06401000, Angostura Reservoir near Hot Springs

Water year	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1950	0	0	0	0	0	0	0	2,990	5,760	9,570	3,700	2,710
1951	3,140	3,980	5,010	6,370	7,470	10,230	11,930	12,270	35,300	48,950	82,410	97,940
1952	97,530	97,610	97,530	95,670	88,710	85,540	79,350	103,100	131,100	131,500	126,300	114,700
1953	107,500	100,900	94,910	89,370	85,210	96,440	92,410	89,750	100,400	88,750	85,550	79,490
1954	79,100	79,310	77,660	76,210	77,200	79,280	80,400	94,310	92,210	82,670	81,160	75,680
1955	75,580	76,070	76,920	78,060	79,640	94,710	136,000	136,200	135,500	120,200	131,800	136,200
1956	131,600	126,800	125,800	123,300	121,100	124,500	120,600	114,700	116,700	97,490	83,080	71,110
1957	66,800	68,240	70,060	71,580	73,980	79,530	86,040	136,400	134,400	125,300	116,100	108,500
1958	107,500	107,400	105,200	102,900	102,100	104,300	114,800	109,600	105,400	133,700	121,200	106,900
1959	99,820	97,120	94,670	92,690	90,410	96,760	98,180	96,320	93,720	86,340	66,150	59,110
1960	59,690	60,740	62,140	63,630	65,410	74,980	76,140	74,810	74,000	59,500	49,090	45,410
1961	45,930	46,750	48,160	49,570	50,870	52,660	53,450	54,390	54,890	50,360	47,360	47,190
1962	47,940	48,860	49,910	51,040	57,100	64,320	64,900	138,300	136,300	136,200	124,500	115,400
1963	117,200	117,900	119,000	120,400	129,400	136,100	136,400	136,100	136,300	126,800	112,300	113,200
1964	112,600	112,400	113,100	114,200	115,900	119,000	124,000	122,600	136,100	121,700	104,100	98,340
1965	96,880	97,570	99,000	100,800	102,900	108,800	114,300	136,100	136,300	136,300	123,500	118,600
1966	120,400	121,400	122,800	124,300	126,200	136,100	136,200	130,900	119,400	121,300	128,000	121,500
1967	114,800	116,700	118,300	120,600	125,400	127,200	126,700	127,200	128,000	125,700	109,900	102,600
1968	99,630	101,300	103,100	105,100	108,200	116,200	120,300	118,800	127,500	118,900	111,800	107,600
1969	105,800	107,100	108,500	110,000	111,800	121,600	124,500	123,200	121,700	127,700	112,300	102,400
1970	101,200	102,600	104,500	105,800	109,600	117,000	123,900	126,800	123,900	106,400	90,700	84,330
1971	85,220	86,690	88,280	89,620	94,140	102,610	124,820	128,800	127,410	113,040	95,560	91,130
1972	92,676	95,204	97,070	98,471	104,871	124,823	126,366	126,273	127,845	112,647	99,152	92,953
1973	93,387	95,125	96,629	98,431	100,886	107,389	113,963	125,384	120,007	110,282	96,072	108,480
1974	110,583	113,390	115,816	121,193	122,204	126,039	127,175	119,322	109,508	91,782	80,308	77,030
1975	77,765	80,164	81,610	83,117	84,514	95,638	109,852	109,594	113,125	100,233	83,080	76,235
1976	76,719	77,694	80,057	81,794	84,960	91,551	94,256	93,861	104,410	91,821	82,823	76,339
1977	76,754	77,694	78,947	80,272	82,014	86,731	92,676	89,466	84,771	74,714	64,444	61,698
1978	63,660	64,891	66,616	68,201	69,708	118,866	123,233	128,323	126,983	127,701	122,719	116,742
1979	115,772	116,874	118,911	120,737	122,157	126,935	126,460	124,028	122,204	116,477	123,514	116,566
1980	114,713	115,904	117,183	118,866	126,133	127,223	126,133	121,832	120,600	100,804	90,354	84,036
1981	84,587	85,713	88,088	90,586	93,071	94,967	93,624	92,168	85,223	81,803	72,542	63,361
1982	64,920	66,283	67,820	69,314	73,180	79,112	80,974	97,959	121,525	113,149	107,267	103,378
1983	108,966	111,370	112,757	114,156	120,289	121,158	121,709	120,883	121,112	109,179	98,763	90,284
1984	92,361	94,310	96,085	98,280	106,508	121,112	121,617	121,525	120,929	107,903	93,060	85,340
1985	86,706	88,539	90,055	91,781	93,450	101,812	102,758	94,978	87,153	73,345	62,394	58,497
1986	59,809	61,819	62,512	64,302	72,682	97,442	118,202	120,012	121,202	113,322	99,812	103,295
1987	114,288	114,112	112,887	115,213	120,198	121,158	121,250	121,250	118,114	103,047	88,313	84,717
1988	84,899	86,225	88,540	89,750	91,010	95,451	93,762	91,356	84,973	70,762	60,249	56,409
1989	56,751	57,866	59,341	60,604	62,004	66,845	68,644	68,867	64,922	57,929	48,302	51,772
1990	52,700	54,100	55,800	57,300	59,300	66,300	69,400	73,600	72,200	62,900	54,700	52,400
1991	53,200	54,500	55,800	57,100	59,200	62,000	63,600	122,000	121,000	111,300	98,700	91,800
1992	92,100	94,000	95,800	97,500	100,400	103,600	104,500	100,500	99,800	93,200	80,000	73,500
1993	74,000	75,200	76,700	78,300	80,000	106,300	121,100	118,700	120,400	119,300	115,300	110,400

[1]Reported contents exclude dead storage.

Table A2. Monthend contents[1], in acre-feet, for station 06409500, Deerfield Reservoir near Hill City

Water year	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1947	(2)	(2)	(2)	(2)	(2)	(2)	(2)	12,460	12,720	12,450	12,340	12,190
1948	12,580	13,120	13,550	14,090	14,600	14,850	14,440	14,240	14,440	14,280	14,130	13,920
1949	13,380	13,380	13,710	14,190	14,550	14,990	14,720	15,100	15,130	14,870	14,050	13,620
1950	13,380	13,420	13,750	14,030	14,320	14,710	15,150	14,970	14,620	13,310	13,110	12,760
1951	12,840	13,060	13,350	13,580	13,770	14,100	14,680	14,580	14,750	14,830	14,060	13,780
1952	13,930	14,180	14,440	14,660	14,920	15,140	15,140	15,150	15,120	14,480	13,600	12,620
1953	12,230	12,420	12,730	13,090	13,450	13,950	14,710	15,140	15,140	14,800	14,370	13,760
1954	13,570	13,820	14,180	14,500	14,840	15,130	15,130	14,460	13,770	11,620	10,150	9,350
1955	9,420	9,670	9,960	10,230	10,540	10,890	12,130	11,830	11,870	10,750	9,490	8,600
1956	8,740	9,030	9,350	9,720	9,970	10,620	11,370	11,900	10,880	9,560	8,330	7,880
1957	7,150	7,380	7,720	8,020	8,260	8,670	9,260	10,000	10,580	10,870	10,220	10,080
1958	10,290	10,480	10,760	11,010	11,290	11,660	12,210	12,030	11,270	10,870	9,820	8,570
1959	8,070	8,150	8,420	8,590	8,880	9,280	9,620	9,270	8,260	6,510	3,330	90
1960	280	897	1,000	1,180	1,280	1,770	2,430	2,820	2,990	2,860	2,760	2,710
1961	1,790	1,940	2,180	2,360	2,540	2,820	3,120	3,390	3,270	3,210	3,120	3,020
1962	3,180	3,300	3,390	3,510	3,870	4,180	4,740	5,170	6,160	6,510	6,520	6,510
1963	6,730	6,840	7,000	7,160	7,350	8,090	9,210	10,310	12,460	12,970	12,890	13,000
1964	13,220	13,480	13,700	14,020	14,280	14,710	15,060	15,010	15,150	14,880	14,060	13,120
1965	12,770	13,140	13,670	14,150	14,570	15,010	15,020	15,070	14,950	15,080	14,890	14,080
1966	12,800	13,480	14,110	14,680	15,130	15,160	15,100	14,820	14,570	14,610	14,420	12,460
1967	12,540	13,040	13,600	14,140	14,620	15,150	15,070	15,090	15,120	14,810	13,940	12,740
1968	13,060	13,590	13,950	14,670	15,160	15,170	15,110	15,090	15,080	15,060	14,910	13,870
1969	13,130	13,490	13,850	14,310	14,720	15,170	15,100	15,000	15,070	15,110	14,210	12,160
1970	12,580	12,960	13,410	13,870	14,280	14,790	15,190	15,050	14,970	14,820	13,640	12,410
1971	12,870	13,300	13,800	14,320	14,840	15,180	15,210	15,210	15,180	15,160	14,990	13,550
1972	12,302	12,810	13,391	13,922	14,513	14,619	14,660	14,921	14,782	15,066	14,741	13,126
1973	12,240	12,652	13,164	13,632	14,057	14,656	15,207	14,946	14,991	14,749	13,966	12,977
1974	12,469	12,897	13,352	13,851	14,272	15,107	15,099	14,737	14,425	14,376	14,037	13,679
1975	13,430	13,718	14,105	14,550	14,864	15,165	15,020	14,729	14,827	14,530	14,316	13,714
1976	13,569	13,828	14,184	14,660	15,128	15,157	15,053	14,950	15,045	14,872	14,794	14,244
1977	13,241	13,457	13,843	14,312	14,704	15,145	15,124	14,921	14,835	14,356	13,542	13,468
1978	13,871	14,268	14,704	15,157	15,149	15,165	15,153	15,124	14,991	15,049	14,505	13,710
1979	13,237	13,729	14,457	14,987	15,062	15,016	15,128	15,049	15,016	14,917	14,721	13,566
1980	12,724	13,156	13,690	14,184	14,680	15,153	15,119	14,905	14,794	14,721	14,749	13,930
1981	13,213	13,577	14,065	14,453	14,790	15,028	15,016	14,962	14,889	14,815	13,686	13,030
1982	13,099	13,375	13,737	14,069	14,409	14,946	13,202	11,623	10,267	6,504	2,717	116
1983	1,011	1,801	2,328	2,949	3,458	3,906	3,989	3,950	4,879	5,410	6,316	6,751
1984	7,363	7,968	8,547	9,159	9,713	10,457	11,462	12,649	13,026	13,137	13,072	13,110
1985	13,352	13,914	14,522	15,165	15,584	14,938	14,987	15,032	14,828	14,558	13,542	13,219
1986	13,660	13,361	13,899	14,466	15,029	15,309	15,194	15,095	15,159	15,295	15,214	14,609
1987	13,756	13,232	13,704	14,218	14,739	15,242	15,336	15,357	15,246	15,209	14,101	13,664
1988	13,217	13,251	13,748	14,161	14,588	15,140	15,214	15,066	14,927	14,352	13,720	13,459
1989	13,490	13,614	14,032	14,443	14,772	15,275	15,030	14,870	14,735	14,240	13,610	13,429
1990	13,300	13,600	14,000	14,400	14,700	15,100	15,100	14,700	14,300	14,000	13,600	13,300
1991	13,300	13,600	13,900	14,200	14,500	14,900	14,800	15,100	14,300	14,100	13,600	13,000
1992	13,400	13,800	14,300	14,700	15,100	14,800	14,700	14,500	14,200	13,800	13,500	13,200
1993	13,200	13,500	14,000	14,400	14,800	15,000	14,900	14,900	15,100	14,600	13,900	12,900

[1]Reported contents include only active storage.
[2]Indicates a no-value month.

Table A3. Monthend contents[1], in acre-feet, for station 06411000, Pactola Reservoir near Silver City

Water year	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1956	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	498	416
1957	603	1,040	1,220	1,210	1,320	2,080	3,410	6,140	10,760	12,780	13,210	12,620
1958	12,960	13,550	13,960	14,260	14,740	15,510	17,030	17,640	18,720	19,160	19,190	18,880
1959	18,760	18,830	19,100	19,250	19,550	20,260	21,570	21,810	22,200	22,000	21,800	23,740
1960	23,960	24,180	24,400	24,630	24,920	26,230	26,840	25,740	24,960	21,740	18,800	16,980
1961	16,980	16,550	16,620	16,720	16,820	17,250	16,500	14,720	10,580	7,010	5,330	4,250
1962	4,080	4,040	3,990	3,990	4,410	4,820	5,210	7,720	18,640	23,040	24,100	24,520
1963	25,640	26,220	26,630	27,050	27,730	29,970	34,090	40,230	55,800	55,290	54,480	54,650
1964	54,280	54,500	54,520	54,720	54,950	55,120	55,430	55,260	55,520	54,730	53,810	54,450
1965	54,380	54,440	54,790	54,960	55,190	55,020	55,350	60,370	55,510	55,640	55,550	55,770
1966	54,360	54,100	53,970	53,860	54,100	54,140	54,770	54,020	52,620	51,040	51,060	52,930
1967	53,040	53,040	53,070	53,410	53,670	54,240	54,740	54,690	56,570	54,420	53,720	53,650
1968	53,370	53,420	53,360	53,460	53,560	53,940	54,690	54,340	54,510	53,410	52,010	52,590
1969	53,230	53,120	53,010	52,970	52,970	53,410	54,770	53,940	52,590	51,890	50,570	50,070
1970	50,130	50,120	50,020	50,060	50,160	50,460	52,650	54,660	54,400	52,270	51,300	50,200
1971	50,380	50,820	51,040	51,320	51,800	52,560	54,680	54,220	54,150	52,470	49,740	50,100
1972	52,716	53,066	53,041	53,066	53,276	52,341	53,057	54,259	58,700	54,781	52,624	52,143
1973	51,986	51,624	51,354	50,964	50,818	51,666	53,994	54,097	53,352	50,834	49,450	49,458
1974	50,383	50,399	50,503	50,664	50,883	51,633	53,175	51,920	50,311	45,767	43,064	42,122
1975	42,664	42,749	42,456	42,378	42,356	42,699	47,464	52,658	54,123	52,541	50,078	47,996
1976	48,398	48,266	48,383	48,430	48,734	49,363	51,370	52,424	54,302	54,020	52,366	51,184
1977	52,483	52,424	52,591	52,808	53,049	53,479	54,558	53,580	51,649	48,570	47,803	47,229
1978	47,726	47,903	48,027	48,211	48,820	50,487	53,319	57,615	54,601	54,413	54,199	54,157
1979	54,097	53,867	53,631	53,319	53,007	53,580	54,362	53,605	52,101	53,108	53,546	53,681
1980	54,533	53,791	53,184	52,633	52,624	53,268	54,738	53,681	53,209	48,921	45,968	45,797
1981	46,985	46,909	47,099	46,947	46,864	47,168	47,510	46,118	45,477	42,585	42,413	40,615
1982	41,039	41,214	41,011	40,927	40,997	41,648	45,017	50,615	56,088	55,031	54,919	55,126
1983	54,901	55,005	54,601	54,618	54,473	54,422	54,712	54,439	55,143	53,007	52,441	51,995
1984	52,974	53,411	53,251	53,352	53,783	54,524	54,610	55,083	55,792	55,610	54,242	53,690
1985	54,473	54,370	54,097	53,833	53,454	54,285	54,806	50,688	48,594	43,173	42,016	41,797
1986	42,271	42,928	43,151	43,339	43,830	45,506	48,469	52,549	53,857	53,892	52,349	53,445
1987	53,808	53,462	52,949	52,816	53,167	54,302	54,635	54,712	54,165	50,423	49,086	48,484
1988	49,165	49,569	49,371	49,110	49,149	49,751	50,704	50,367	46,408	40,850	37,515	35,124
1989	35,080	35,117	34,810	34,547	34,410	35,232	36,471	35,842	31,873	27,310	24,497	24,547
1990	25,500	25,300	25,000	24,800	24,700	25,500	28,000	29,200	29,700	26,300	24,700	24,000
1991	24,800	24,200	24,000	23,900	24,100	24,600	26,700	32,900	45,200	46,000	44,300	43,700
1992	43,600	43,700	43,500	43,100	43,000	44,500	45,900	43,800	43,700	44,300	41,900	39,900
1993	39,400	39,200	38,900	38,600	38,400	39,100	41,600	50,200	55,300	54,400	54,400	53,500

[1]Reported contents exclude dead and inactive storage.
[2]Indicates a no-value month.

Table A4. Monthend contents[1], in acre-feet, for station 06427000, Keyhole Reservoir near Moorcroft, WY

Water year	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1952	(2)	(2)	(2)	(2)	0	11,000	10,200	15,000	15,100	14,900	11,100	10,500
1953	9,760	9,590	9,490	9,530	9,600	15,070	13,080	9,580	19,860	13,910	12,610	10,300
1954	10,070	10,000	9,940	9,860	9,990	9,850	9,720	9,600	10,740	8,920	8,360	7,960
1955	7,340	6,820	6,490	6,280	6,100	16,320	33,450	32,430	34,360	30,880	25,580	16,990
1956	16,730	16,780	19,420	19,450	20,950	22,060	17,180	16,770	15,830	13,700	13,360	12,960
1957	12,600	12,670	12,590	12,520	14,120	12,320	12,930	13,870	14,230	12,360	11,420	11,180
1958	11,060	11,000	10,950	10,860	11,560	12,510	12,940	10,060	12,450	12,420	9,490	9,060
1959	8,810	8,790	8,760	8,740	8,780	14,390	11,110	9,820	16,760	12,110	10,180	9,900
1960	9,830	9,830	9,770	9,750	9,730	24,490	21,510	15,070	15,940	14,940	14,420	13,540
1961	13,170	13,040	13,020	12,970	13,530	12,460	12,360	12,190	9,310	8,860	8,430	8,290
1962	8,210	8,170	8,120	8,120	21,830	19,250	9,950	40,440	70,930	73,450	72,880	71,440
1963	70,540	69,750	69,480	69,360	76,360	76,740	80,120	83,860	97,600	93,900	86,060	83,180
1964	81,480	80,600	80,250	80,250	80,470	82,600	86,620	91,980	135,800	135,800	128,000	125,300
1965	123,200	122,000	122,600	123,200	130,000	134,500	139,000	145,500	146,400	145,400	141,300	139,400
1966	137,800	136,600	135,700	135,600	135,600	139,500	140,800	138,000	129,400	122,800	120,900	119,800
1967	118,000	116,800	117,400	118,100	121,800	130,700	129,200	135,400	146,900	140,700	129,900	126,600
1968	124,600	123,800	123,800	124,300	125,600	130,100	129,100	128,800	131,000	124,900	120,800	119,800
1969	117,800	116,900	116,900	117,900	117,100	125,200	130,100	136,400	135,200	136,600	128,000	122,400
1970	121,000	120,400	120,400	121,400	123,600	126,400	131,300	138,900	138,400	130,300	121,000	118,800
1971	117,300	117,000	117,100	117,700	122,900	137,800	161,400	168,300	173,300	165,500	156,000	153,400
1972	157,100	156,800	156,800	157,100	176,600	179,100	178,300	180,200	183,800	180,400	176,500	170,500
1973	167,500	167,200	167,300	167,300	167,500	168,500	172,600	172,800	171,500	164,800	157,800	157,300
[3]1974	147,800	146,800	147,100	152,600	157,800	158,800	158,500	156,800	152,500	141,900	132,900	129,900
[3]1975	129,036	128,483	128,345	128,414	128,414	134,725	142,090	147,496	148,900	141,866	131,559	126,619
[3]1976	125,030	124,132	124,340	124,616	128,552	130,210	131,128	131,847	142,165	137,819	131,343	124,271
[3]1977	122,128	121,929	121,532	121,929	122,459	126,342	134,509	133,430	130,624	119,743	105,881	104,025
[3]1978	104,665	102,571	102,745	102,803	103,211	142,615	143,664	180,444	163,253	162,662	155,709	149,290
[3]1979	147,730	146,404	147,184	147,652	148,120	158,631	161,902	157,576	152,644	148,354	143,214	138,344
[3]1980	135,877	134,294	134,006	133,718	138,119	139,618	139,393	134,222	130,071	118,750	98,291	96,566
[3]1981	93,505	92,166	92,538	92,698	92,698	94,117	85,321	66,822	54,521	47,236	39,240	34,705
[3]1982	34,110	33,710	33,656	33,736	37,393	38,735	39,210	48,807	54,669	52,621	48,876	47,983
[3]1983	50,269	51,544	51,938	53,347	58,905	60,111	60,621	60,504	58,789	48,876	43,447	42,556
[3]1984	43,191	43,096	43,255	43,319	45,399	57,561	58,944	71,394	82,540	77,766	74,529	72,473
[3]1985	71,394	71,439	71,439	71,350	71,305	74,482	74,529	69,537	65,434	55,002	49,535	48,051
[3]1986	47,473	47,405	47,813	47,988	49,018	56,386	59,722	66,568	66,695	60,068	54,518	55,972
[3]1987	58,135	58,519	58,558	58,558	61,134	76,487	79,787	84,650	82,341	75,783	71,439	70,682
[3]1988	69,803	69,406	69,281	69,281	71,082	75,410	75,555	73,112	63,825	55,267	47,714	45,432
[3]1989	45,008	44,648	44,746	44,779	45,136	50,269	51,050	53,534	49,608	40,970	33,078	32,558
[4]1990	39,300	39,300	39,600	39,900	45,300	49,300	50,600	52,600	47,700	39,700	32,100	30,700
[4]1991	30,300	30,100	30,100	30,100	30,600	30,900	32,000	46,000	47,700	40,100	32,100	31,700
[4]1992	29,000	29,200	29,200	29,300	29,500	29,900	29,200	26,200	24,900	24,200	18,800	18,200
[4]1993	17,900	17,900	17,900	17,900	18,000	24,500	31,300	50,200	67,000	68,800	69,600	67,500

[1]Reported contents include active, inactive, and dead storage, unless noted otherwise.
[2]Indicates a no-value month.
[3]Reported contents for year include only active storage.
[4]Reported contents for year include active and inactive storage.

Table A5. Monthend contents[1], in acre-feet, for station 06435000, Belle Fourche Reservoir near Belle Fourche

Water year	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1912	(2)	(2)	(2)	40,050	53,050	73,500	67,500	78,750	63,000	53,250	60,850	56,350
1913	64,300	76,000	88,000	87,980	87,980	96,600	107,000	122,000	113,600	80,900	63,500	64,720
1914	70,900	80,900	82,850	82,850	82,850	90,500	103,900	119,000	96,600	64,720	54,400	37,980
1915	52,550	60,150	67,260	76,150	77,500	96,000	138,700	142,900	166,100	169,800	160,300	146,400
1916	135,500	145,000	145,000	145,000	145,000	149,900	151,300	130,300	90,500	64,300	64,720	29,500
1917	29,230	36,750	37,980	52,550	63,900	85,220	123,200	143,600	140,800	92,300	63,900	49,120
1918	55,920	63,100	70,900	79,900	94,760	125,800	148,500	163,900	138,100	135,500	122,600	123,200
1919	131,600	138,100	145,000	160,300	166,100	181,000	197,400	183,400	131,600	87,980	65,140	55,920
1920	70,430	84,650	94,760	107,600	118,400	149,200	177,200	195,000	195,600	185,300	147,100	133,500
1921	132,900	138,700	147,800	158,300	116,800	179,400	182,600	169,800	152,800	112,400	85,790	67,260
1922	71,330	77,500	86,360	96,000	105,200	120,200	152,800	148,800	138,700	116,000	81,900	62,700
1923	67,690	87,500	96,600	110,000	120,200	143,600	150,600	172,100	171,300	161,700	166,800	168,300
1924	173,600	172,100	169,800	169,800	177,200	184,200	182,600	177,200	148,500	120,800	92,900	75,250
1925	95,380	108,800	114,800	114,800	124,400	152,800	168,300	165,300	166,800	125,800	93,520	82,850
1926	92,900	105,800	106,400	114,200	115,400	146,400	163,900	165,300	160,300	132,900	108,200	92,900
1927	98,400	109,400	119,000	129,600	141,500	159,600	173,600	179,400	178,600	164,600	142,900	121,400
1928	130,000	127,000	127,000	124,400	124,400	125,100	125,100	110,000	86,360	67,260	22,900	1,660
1929	0	5,170	16,200	26,520	35,760	72,190	102,000	127,700	139,400	129,000	87,500	73,050
1930	92,900	103,300	113,600	113,600	115,400	129,600	153,500	147,100	124,400	84,200	39,980	14,150
1931	27,610	35,760	49,120	55,920	68,120	83,900	94,140	87,500	52,550	18,300	640	-2,000
1932	0	7,920	16,620	26,520	42,800	66,400	95,380	116,600	136,100	106,400	71,760	48,750
1933	55,540	62,300	67,260	76,150	84,650	111,900	138,100	167,500	145,000	99,600	60,580	47,550
1934	54,030	57,410	63,900	74,810	83,750	92,900	105,800	77,050	73,930	41,700	10,700	3,580
1935	10,700	15,200	24,200	33,300	42,700	58,500	68,900	77,600	96,600	58,500	27,000	6,400
1936	9,800	15,200	23,600	32,500	40,600	64,300	78,000	73,000	36,700	18,000	2,000	-3,000
1937	2,500	7,300	15,800	23,600	31,500	41,400	50,600	45,200	72,200	96,600	61,500	54,400
1938	58,600	62,300	68,500	76,600	83,700	95,400	104,500	107,500	83,300	54,400	25,400	6,700
1939	9,800	12,600	19,000	28,700	35,000	55,500	64,500	48,800	50,600	26,800	9,970	0
1940	0	100	5,700	10,540	17,550	26,320	42,870	48,700	59,600	39,970	17,080	3,175
1941	7,455	10,000	16,510	22,550	28,030	34,900	60,540	74,040	138,400	109,100	86,830	109,700
1942	114,000	115,200	123,700	130,300	137,100	149,900	161,000	174,000	174,800	147,000	112,700	98,280
1943	102,300	105,600	114,600	123,000	141,200	164,100	165,600	151,400	157,300	136,400	96,570	73,520
1944	75,600	81,390	89,640	97,710	105,100	127,600	156,600	167,100	179,500	162,600	131,700	105,600
1945	107,300	115,900	121,000	122,300	127,600	140,500	151,400	167,100	173,200	145,600	112,700	104,500
1946	109,100	113,300	119,100	127,600	137,800	149,900	157,300	177,100	175,600	161,000	130,300	134,400
1947	142,700	141,200	141,200	145,600	155,000	160,300	161,800	161,800	169,400	156,600	124,300	106,700
1948	116,500	121,700	134,400	144,800	155,000	167,100	168,600	166,400	161,000	155,800	131,700	102,800
1949	101,100	105,600	112,100	119,700	126,300	136,400	150,600	161,800	127,600	89,080	47,550	33,450
1950	39,970	45,100	52,690	61,320	69,320	93,100	141,200	166,400	135,000	94,840	66,420	47,900
1951	54,660	59,600	68,000	75,080	81,390	94,260	103,900	96,570	97,140	69,320	44,750	44,400
1952	52,690	59,600	65,640	72,080	88,510	117,800	143,400	138,400	102,800	81,390	41,350	19,180
1953	22,550	26,940	35,200	43,480	51,900	65,640	76,640	113,300	147,700	110,300	106,200	76,640
1954	75,080	80,750	89,640	97,140	109,100	120,400	136,400	141,200	148,500	102,800	60,070	30,110
1955	32,000	36,700	44,400	51,500	58,190	68,000	101,700	115,900	112,100	76,120	45,100	34,610
1956	43,480	48,700	60,930	69,780	78,200	98,850	115,900	117,800	88,510	49,900	15,400	2,000

Table A5. Monthend contents[1], in acre-feet, for station 06435000, Belle Fourche Reservoir near Belle Fourche—Continued

Water year	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1957	5,870	14,330	22,980	28,450	37,000	49,900	62,490	77,160	101,700	68,000	37,600	30,920
1958	36,400	42,870	50,700	59,600	66,030	78,200	98,850	101,100	104,500	77,160	34,030	7,730
1959	11,870	16,140	24,480	32,000	39,280	58,190	70,700	73,000	56,790	34,900	1,520	688
1960	7,080	12,660	20,550	27,610	34,320	60,930	72,080	66,030	59,130	24,060	8,270	2,090
1961	3,600	9,070	16,140	22,550	29,300	37,600	42,260	37,300	24,950	10,160	430	0
1962	5,160	9,470	14,850	21,350	34,610	58,190	73,000	115,200	161,800	165,600	133,700	113,300
1963	119,700	127,600	135,000	141,200	160,300	174,800	181,900	185,200	185,200	149,900	109,700	103,900
1964	100,600	107,900	115,200	124,300	133,000	142,000	155,800	163,300	185,200	157,300	112,700	89,640
1965	102,300	109,100	118,400	129,600	140,500	152,800	182,700	189,200	186,000	161,800	131,000	123,000
1966	119,100	129,000	139,800	149,900	152,100	155,800	157,300	151,400	120,400	84,580	63,670	49,100
1967	56,800	68,400	75,600	86,800	100,000	129,000	147,000	174,000	168,600	129,000	79,500	72,500
1968	82,670	93,680	101,700	112,100	123,700	142,700	155,000	144,800	146,300	108,500	77,680	64,450
1969	69,780	80,110	88,510	97,140	106,740	132,330	161,050	165,600	161,800	129,650	75,600	46,850
1970	54,270	67,610	76,640	90,200	103,380	113,310	145,550	162,560	157,300	106,180	65,640	49,900
1971	61,320	73,520	86,260	98,620	132,330	156,550	165,600	162,560	161,050	111,510	60,070	56,320
1972	89,637	106,180	119,700	133,000	153,570	164,840	164,840	166,360	164,840	136,400	119,062	102,260
1973	118,423	133,680	145,552	161,050	162,560	164,080	164,080	164,840	158,050	107,901	75,600	76,120
1974	90,780	106,740	119,062	136,400	152,108	164,840	166,360	160,300	139,120	86,826	47,200	38,245
1975	47,200	58,192	69,320	81,390	93,680	125,640	151,377	168,640	171,710	125,640	70,240	48,300
1976	55,850	66,820	78,200	93,680	104,500	119,700	135,720	134,360	146,271	93,100	30,380	9,470
1977	20,950	34,320	46,150	57,724	68,860	86,264	123,660	121,680	87,388	42,873	17,649	27,397
1978	50,700	62,884	73,520	85,702	97,140	159,550	179,521	186,786	182,749	148,380	105,620	80,114
1979	89,637	102,260	113,311	123,000	133,680	163,320	184,363	170,940	147,722	114,589	80,114	49,500
1980	56,318	65,635	75,600	85,702	96,000	108,502	120,360	90,780	91,940	34,030	14,162	24,270
1981	35,800	45,800	56,787	66,425	75,080	85,140	93,100	98,850	102,260	80,751	48,700	36,100
1982	45,100	53,875	62,492	68,860	78,825	93,680	103,940	[3]170,170	[3]183,500	[3]155,100	[3]119,100	[3]103,400
1983	[3]133,000	[3]146,300	[3]157,300	[3]174,000	[3]183,600	[3]185,100	[3]185,100	[3]184,400	[3]163,300	[3]119,100	[3]86,300	[3]68,000
1984	[3]80,750	[3]92,520	[3]102,260	[3]114,720	[3]126,500	[3]143,400	[3]159,100	[3]185,010	[3]181,090	[3]145,480	[3]103,770	[3]74,980
1985	[3]92,200	[3]104,700	[3]115,000	[3]125,600	[3]135,100	[3]161,900	[3]175,100	[3]150,100	[3]127,900	[3]67,700	[3]24,900	[3]18,000
1986	[3]29,069	[3]39,970	[3]49,780	[3]60,347	[3]75,704	[3]102,820	[3]130,856	[3]166,208	[3]166,512	[3]122,406	[3]81,800	[3]87,500
1987	[3]100,617	[3]113,070	[3]123,462	[3]132,866	[3]142,820	[3]167,348	[3]185,229	[3]186,734	[3]166,512	[3]128,779	[3]111,627	[3]104,724
1988	[3]112,228	[3]117,912	[3]126,036	[3]133,068	[3]141,669	[3]156,936	[3]169,785	[3]162,016	[3]116,752	[3]77,224	[3]34,957	[3]31,230
1989	[3]33,923	[3]43,136	[3]52,035	[3]60,278	[3]67,098	[3]86,548	[3]103,004	[3]123,020	[3]103,890	[3]62,060	[3]17,720	[3]15,050
1990	26,400	37,500	48,600	59,600	69,200	82,500	93,400	113,800	101,900	64,900	30,700	23,500
1991	29,800	37,400	44,900	51,900	59,600	69,200	81,500	102,500	106,100	64,700	28,200	21,400
1992	27,800	38,400	47,600	55,400	63,400	71,900	79,900	66,800	57,900	47,300	13,600	10,600
1993	17,500	26,500	33,500	40,800	48,200	70,400	85,800	104,300	141,200	152,200	127,600	114,500

[1]Reported contents include only active storage.
[2]Indicates a no-value month.
[3]Revised.

Section B - Tables of monthly flows for stations with records of only monthly flows

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Table B1. Monthly flows, in acre-feet, for station 06413000, Bennett Ditch at Rapid City

Water year	Oct..	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	96	34	(2)
1947	23	(1)	(1)	(1)	(1)	(1)	18	86	49	110	153	159	(2)
1948	32	(1)	(1)	(1)	(1)	(1)	31	70	37	89	93	92	(2)
1949	77	(1)	(1)	(1)	(1)	(1)	48	70	66	94	128	87	(2)
1950	19	(1)	(1)	(1)	(1)	(1)	8.7	12	93	92	56	43	(2)
1951	7.7	(1)	(1)	(1)	(1)	(1)	6.0	73	56	65	43	34	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B2. Monthly flows, in acre-feet, for station 06413500, Leedy Ditch at Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	424	460	(2)
1947	460	(1)	(1)	(1)	(1)	(1)	442	399	301	396	496	484	(2)
1948	502	(1)	(1)	(1)	(1)	(1)	263	328	508	502	474	434	(2)
1949	546	(1)	(1)	(1)	(1)	(1)	601	619	587	567	505	467	(2)
1950	439	(1)	(1)	(1)	(1)	(1)	243	328	390	488	503	493	(2)
1951	412	361	369	369	333	369	338	418	465	438	506	492	4,870

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B3. Monthly flows, in acre-feet, for station 06414500, Iowa Ditch at Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.0	3.2	(2)
1947	3.6	(1)	(1)	(1)	(1)	(1)	106	145	16	21	16	82	(2)
1948	151	(1)	(1)	(1)	(1)	(1)	207	430	165	127	100	78	(2)
1949	389	(1)	(1)	(1)	(1)	(1)	136	134	538	286	68	10	(2)
1950	94	(1)	(1)	(1)	(1)	(1)	9.1	6.1	0	242	117	76	(2)
1951	200	(1)	(1)	(1)	(1)	(1)	152	280	230	222	261	255	(2)
1952	139	(1)	(1)	(1)	(1)	(1)	188	212	214	387	186	54	(2)
1953	260	(1)	(1)	(1)	(1)	(1)	14	97	134	152	194	72	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B4. Monthly flows, in acre-feet, for station 06415000, Lockhart Ditch at Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	69	(2)
1947	34	(1)	(1)	(1)	(1)	(1)	9.7	58	33	136	68	0	(2)
1948	29	(1)	(1)	(1)	(1)	(1)	47	78	24	8.5	59	45	(2)
1949	97	(1)	(1)	(1)	(1)	(1)	35	133	111	147	49	44	(2)
1950	78	(1)	(1)	(1)	(1)	(1)	2.0	27	77	118	102	45	(2)
1951	48	(1)	(1)	(1)	(1)	(1)	2.4	37	44	45	31	8.1	(2)
1952	24	(1)	(1)	(1)	(1)	(1)	13	59	44	37	32	11	(2)
1953	32	(1)	(1)	(1)	(1)	(1)	0	22	40	32	29	43	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B5. Monthly flows, in acre-feet, for station 06416500, Murphy Ditch near Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	614	(2)
1947	404	(1)	(1)	(1)	(1)	(1)	0	421	547	517	730	1,560	(2)
1948	687	(1)	(1)	(1)	(1)	(1)	6.0	513	522	348	999	826	(2)
1949	654	(1)	(1)	(1)	(1)	(1)	0	185	480	425	1,130	876	(2)
1950	220	(1)	(1)	(1)	(1)	(1)	0	34	1,010	1,150	798	626	(2)
1951	0.6	(1)	(1)	(1)	(1)	(1)	314	902	470	297	803	84	(2)
1952	51	(1)	(1)	(1)	(1)	(1)	101	998	393	555	1,140	660	(2)
1953	0.79	(1)	(1)	(1)	(1)	(1)	0	0	236	888	1,030	1,100	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B6. Monthly flows, in acre-feet, for station 06417000, Cyclone Ditch near Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	328	(2)
1947	236	(1)	(1)	(1)	(1)	(1)	2.2	110	91	65	336	273	(2)
1948	48	(1)	(1)	(1)	(1)	(1)	6.9	236	244	101	285	379	(2)
1949	276	(1)	(1)	(1)	(1)	(1)	0	39	190	394	440	255	(2)
1950	41	(1)	(1)	(1)	(1)	(1)	0	63	468	524	299	156	(2)
1951	0.70	(1)	(1)	(1)	(1)	(1)	11	491	223	114	316	117	(2)
1952	28	(1)	(1)	(1)	(1)	(1)	110	482	183	378	477	396	(2)
1953	203	(1)	(1)	(1)	(1)	(1)	28	74	134	343	392	189	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B7. Monthly flows, in acre-feet, for station 06417500, South Side Ditch near Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	508	215	(2)
1947	73	(1)	(1)	(1)	(1)	(1)	38	357	562	424	526	498	(2)
1948	672	(1)	(1)	(1)	(1)	(1)	21	399	433	325	767	732	(2)
1949	677	(1)	(1)	(1)	(1)	(1)	107	167	880	716	749	625	(2)
1950	211	(1)	(1)	(1)	(1)	(1)	22	362	1,040	927	300	222	(2)
1951	25	(1)	(1)	(1)	(1)	(1)	0	888	484	208	307	226	(2)
1952	99	(1)	(1)	(1)	(1)	(1)	152	965	321	551	739	913	(2)
1953	372	(1)	(1)	(1)	(1)	(1)	28	28	484	513	633	574	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B8. Monthly flows, in acre-feet, for station 06418000, Little Giant Ditch near Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	298	60	(2)
1947	0	(1)	(1)	(1)	(1)	(1)	0	21	53	0	344	142	(2)
1948	129	(1)	(1)	(1)	(1)	(1)	2.2	6.1	251	93	106	172	(2)
1949	197	(1)	(1)	(1)	(1)	(1)	6.1	105	72	51	6.9	5.0	(2)
1950	0	(1)	(1)	(1)	(1)	(1)	0	3.6	402	261	142	51	(2)
1951	8.1	(1)	(1)	(1)	(1)	(1)	19	28	286	47	213	130	(2)
1952	6.9	(1)	(1)	(1)	(1)	(1)	0	36	0	1.4	223	112	(2)
1953	19	(1)	(1)	(1)	(1)	(1)	0	0	2.0	1.9	12	5.2	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B9. Monthly flows, in acre-feet, for station 06418500, Rapid Creek below Little Giant Ditch, near Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1,540	2,920	(2)
1947	4,310	3,680	2,730	3,170	2,670	3,460	6,820	5,440	17,640	12,840	2,850	609	66,220
1948	1,850	3,080	3,100	2,530	3,110	4,150	4,330	2,670	4,300	4,810	2,270	275	36,480
1949	724	3,190	2,970	2,430	2,400	5,270	7,090	4,950	5,860	1,850	484	827	38,040
1950	2,450	2,790	2,320	2,410	2,270	2,790	6,720	7,890	603	756	961	1,140	33,100
1951	2,250	2,680	2,530	2,110	1,990	2,520	2,340	541	2,580	2,700	1,400	2,720	26,360

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B10. Monthly flows, in acre-feet, for station 06419000, Lone Tree Ditch near Rapid City

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	180	(2)
1947	79	(1)	(1)	(1)	(1)	(1)	93	368	609	135	148	244	(2)
1948	230	(1)	(1)	(1)	(1)	(1)	233	438	576	409	369	391	(2)
1949	506	(1)	(1)	(1)	(1)	(1)	6.0	75	713	655	285	192	(2)
1950	411	(1)	(1)	(1)	(1)	(1)	1.0	220	667	460	618	473	(2)
1951	92	(1)	(1)	(1)	(1)	(1)	63	637	362	289	331	277	(2)
1952	26	(1)	(1)	(1)	(1)	(1)	89	684	318	495	581	497	(2)
1953	387	(1)	(1)	(1)	(1)	(1)	19	135	633	598	401	330	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B11. Monthly flows, in acre-feet, for station 06419500, Saint German Ditch at Caputa

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	490	214	(2)
1947	108	(1)	(1)	(1)	(1)	(1)	12	858	681	289	609	532	(2)
1948	227	(1)	(1)	(1)	(1)	(1)	49	865	740	251	314	437	(2)
1949	497	(1)	(1)	(1)	(1)	(1)	31	698	564	551	479	237	(2)
1950	80	(1)	(1)	(1)	(1)	(1)	3.4	240	712	839	287	461	(2)
1951	150	(1)	(1)	(1)	(1)	(1)	835	477	916	372	383	49	(2)
1952	66	(1)	(1)	(1)	(1)	(1)	119	955	530	525	341	392	(2)
1953	656	(1)	(1)	(1)	(1)	(1)	0	422	712	474	484	272	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B12. Monthly flows, in acre-feet, for station 06420000, Rapid Creek at Caputa

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2,430	3,800	(2)
1947	4,730	4,370	2,930	2,970	2,660	4,060	6,900	4,660	18,700	13,530	3,040	1,020	69,570
1948	2,630	3,080	3,370	3,090	2,800	4,030	4,180	1,670	4,240	4,300	2,880	493	36,760
1949	1,650	3,790	3,170	2,280	2,330	5,750	7,400	4,460	5,990	1,400	861	1,410	40,490
1950	2,760	2,560	2,320	2,130	2,210	3,190	6,960	7,980	320	621	1,420	1,440	33,910
1951	2,530	2,440	2,220	1,960	2,070	2,780	1,610	221	3,000	2,560	1,460	3,000	25,850
1952	2,920	2,610	2,350	2,220	2,350	2,910	4,800	16,270	8,620	2,630	40	324	48,040
1953	747	1,330	2,280	2,400	2,170	4,010	4,560	6,900	5,880	1,430	2,190	155	34,050
1954	438	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B13. Monthly flows, in acre-feet, for station 06420500, Hammerquist Ditch near Farmingdale

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	37	50	(2)
1947	30	(1)	(1)	(1)	(1)	(1)	1.4	1.2	16	8.5	0	0	(2)
1948	0	0	0	0	0	0	0	0	0	0	0	0	0
1949	0	0	0	0	0	0	0	0	0	0	0	0	0
1950	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B14. Monthly flows, in acre-feet, for station 06429000, Belle Fourche River at Belle Fourche

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1903	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3,392	7,194	46,177	37,131	(2)
1904	4,300	(1)	(1)	(1)	(1)	(1)	16,480	22,930	88,960	9,100	2,355	3,993	(2)
1905	6,272	4,034	4,072	(1)	(1)	(1)	5,218	13,470	20,470	32,650	32,650	4,558	(2)
1906	6,456	4,980	(1)	(1)	(1)	(1)	28,100	37,300	29,100	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B15. Monthly flows, in acre-feet, for station 06431000, Spearfish Creek near Spearfish

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1904	(1)	(1)	(1)	(1)	(1)	(1)	6,664	8,485	32,730	6,825	4,692	4,939	(2)
1905	5,110	4,504	4,255	3,100	2,900	3,302	4,707	14,200	9,104	11,380	6,948	5,433	74,900
1906	5,534	5,236	4,340	4,340	3,920	4,810	4,940	8,360	7,080	5,680	5,260	5,000	64,500
1907	5,200	4,760	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B16. Monthly flows, in acre-feet, for station 06432000, Spearfish Creek at Toomey Ranch, near Spearfish

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1903	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2,916	2,582	2,582	4,344	(2)
1904	4,304	3,749	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B17. Monthly flows, in acre-feet, for station 06432500, Redwater Canal at Minnesala

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1904	(1)	0	0	0	0	0	0	2,755	1,273	3,708	5,122	1,446	(2)
1905	500	0	0	0	0	0	0	(1)	2,202	1,390	3,874	2,838	(2)
1906	821	0	0	0	0	0	0	280	625	4,330	3,460	1,320	10,840
1907	603	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table B18. Monthly flows, in acre-feet, for station 06434000, Redwater Creek at Belle Fourche

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1903	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	8,310	11,560	(2)
1904	7,700	6,000	6,200	5,580	5,800	11,100	13,210	8,854	65,220	10,880	5,688	10,710	157,000
1905	13,030	11,600	12,200	12,000	11,000	10,510	11,420	34,060	15,230	(1)	(1)	(1)	(2)
1906	(1)	(1)	(1)	(1)	(1)	(1)	13,000	20,500	15,900	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Section C - Tables of monthly flows for stations with less than 5 years of daily record

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Table C1. Mean flow, in cubic feet per second, for station 06394600, Hell Canyon near Jewel Cave, near Custer

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1978	(1)	(1)	(1)	(1)	(1)	(1)	0.000	0.000	0.000	0.000	0.000	0.000	(2)
1979	0.000	0.000	0.000	0.000	0.000	0.000	.000	.000	.000	.000	.000	.000	0 .000
1980	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C2. Mean flow, in cubic feet per second, for station 06394605, Hell Canyon near Custer

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1978	(1)	(1)	(1)	(1)	(1)	(1)	0.000	0.000	0.000	0.000	0.000	0.000	(2)
1979	0.000	0.000	0.000	0.000	0.000	0.000	.000	.000	.000	.000	.000	.000	0 .000
1980	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C3. Mean flow, in cubic feet per second, for station 06400870, Horsehead Creek near Oelrichs

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	99.4	117	1.11	3.30	3.39	18.7
1983	.15	.53	.000	.064	2.01	1.32	17.1	37.1	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C4. Mean flow, in cubic feet per second, for station 06402430, Beaver Creek near Pringle

Wate year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1991	(1)	0.18	0.094	0.037	0.065	0.30	0.29	0.46	0.64	0.28	0.17	0.032	(2)
1992	.095	.20	.23	.14	.25	.45	.39	.54	.59	.55	.23	.18	0.32
1993	.13	.27	.22	.16	.26	.79	.98	.94	2.99	.95	1.21	1.25	.84

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C5. Mean flow, in cubic feet per second, for station 06402470, Beaver Creek above Buffalo Gap

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1991	8.18	8.55	8.29	8.25	8.22	8.12	8.12	8.27	8.49	8.15	7.84	7.79	8.19
1992	8.27	8.46	8.45	8.22	8.32	8.29	8.03	7.43	7.24	8.01	8.35	8.40	8.12
1993	8.62	8.60	8.47	8.68	8.70	9.78	9.35	9.12	9.42	9.82	9.90	9.50	9.17

Table C6. Mean flow, in cubic feet per second, for station 06402990, French Creek below Custer

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1991	0.28	0.74	0.22	0.18	0.30	2.23	4.45	14.1	23.3	3.68	8.96	1.11	4.97
1992	1.55	2.42	1.28	.39	1.05	4.67	3.14	1.91	2.71	2.10	.47	.19	1.82

Table C7. Mean flow, in cubic feet per second, for station 06402995, French Creek above Stockade Lake near Custer

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1991	0.56	1.06	0.30	0.19	0.35	3.03	6.12	31.7	40.3	6.07	10.3	1.47	8.48
1992	1.76	2.66	1.63	.48	1.46	5.72	3.70	2.31	4.74	4.76	1.89	.50	2.64
1993	.42	.60	.34	.29	.31	4.57	7.99	15.8	36.0	14.9	6.78	3.96	7.67

Table C8. Mean flow, in cubic feet per second, for station 06403000, French Creek near Custer

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.11	1.30	0.52	(2)
1946	0.78	1.14	0.43	0.58	0.71	2.03	2.11	42.7	24.4	19.0	3.47	13.4	9.28
1947	11.7	7.30	5.48	2.35	6.79	10.8	12.9	15.0	58.5	69.3	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C9. Mean flow, in cubic feet per second, for station 06403500, French Creek near Fairburn

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.47	0.074	0.000	(2)
1946	0.000	0.000	0.000	(1)	0.000	0.000	0.000	28.5	17.8	12.6	.74	.090	(2)
1947	.29	.13	.000	.000	.000	.000	.000	2.84	58.2	49.3	18.8	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C10. Mean flow, in cubic feet per second, for station 06404500, Battle Creek near Hermosa

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	4.14	12.6	2.28	(2)
1946	2.13	2.45	2.04	1.93	2.05	2.75	2.58	51.6	48.6	51.4	4.25	9.66	15.2
1947	13.8	7.87	5.10	4.10	3.92	3.36	5.55	11.3	105	59.5	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C11. Mean flow, in cubic feet per second, for station 06405400, Grace Coolidge Creek near Fairburn

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1978	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.58	0.000	0.000	0.000	(2)
1979	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.000	3.15	.37	.000	0.30
1980	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C12. Mean flow, in cubic feet per second, for station 06406920, Spring Creek above Sheridan Lake, near Keystone

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1991	2.61	3.32	2.28	2.42	2.16	5.56	10.4	73.7	121	26.9	13.0	6.12	22.5
1992	5.35	6.60	4.94	2.50	3.22	7.02	7.20	5.64	8.14	11.2	7.05	3.70	6.06
1993	3.00	2.37	1.62	1.80	2.30	9.48	17.6	71.3	108	45.2	22.8	12.7	24.9

Table C13. Mean flow, in cubic feet per second, for station 06407000, Spring Creek near Hill City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1938	1.06	.99	1.39	1.06	1.12	2.05	11.2	7.51	6.35	5.85	1.61	3.02	3.60
1939	3.52	1.48	.96	.68	.66	1.08	3.04	1.93	1.94	1.24	6.63	.68	2.00
1940	.98	.93	.81	1.11	1.08	.71	4.31	3.03	4.16	2.66	4.77	.57	2.10

Table C14. Mean flow, in cubic feet per second, and statistics for station 06408000, Spring Creek near Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
[1]1903	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	14.8	10.0	6.73	(3)
[1]1904	6.00	4.03	(2)	(2)	(2)	(2)	0.22	10.6	161	58.5	15.5	8.03	(3)
[1]1905	8.32	6.75	(2)	(2)	(2)	(2)	(2)	(2)	17.1	85.2	77.8	22.3	(3)
[1]1906	12.3	12.3	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(3)
[4]1945	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	3.92	4.46	.000	(3)
[4]1946	.000	.000	.000	.000	.000	.000	.000	92.5	125	85.2	17.7	16.7	28.2
[4]1947	14.4	7.9	3.13	.000	.000	.13	4.02	17.0	142	111	(2)	(2)	(3)

[1]Only monthly values available for year.
[2]Indicates a no-value month.
[3]Incomplete water year.
[4]Daily values available for year.

Table C15. Mean flow, in cubic feet per second, for station 06412510, Rapid Creek above Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1991	(1)	(1)	(1)	.64	.63	.98	3.91	35.2	53.8	46.3	57.3	31.7	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C16. Mean flow, in cubic feet per second, for station 06412810, Cleghorn Springs at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1993	10.8	9.81	9.89	10.3	10.3	10.2	11.3	11.1	13.5	12.3	11.3	12.0	11.1

Table C17. Mean flow, in cubic feet per second, for station 06413200, Rapid Creek below Park Drive, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	25.2	22.2	21.8	21.5	24.6	23.6	33.2	61.9	88.3	105	72.2	58.1	46.5
1989	18.9	23.4	22.9	21.7	20.1	18.5	19.4	48.8	79.5	79.4	66.2	23.3	37.0
1990	18.9	20.3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C18. Mean flow, in cubic feet per second, for station 06413300, Leedy Ditch at headgate below Canyon Lake Dam, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	1.26	1.26	.19	.000	.000	.000	1.74	2.03	1.74	2.36	2.34	2.19	1.26
1989	1.00	.61	.45	.000	.000	.000	.37	1.76	1.68	1.88	1.48	1.09	.87
1990	.67	.034	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C19. Mean flow, in cubic feet per second, for station 06413550, Leedy Ditch at mouth, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	0.71	0.69	0.092	0.000	0.000	0.000	0.29	0.79	0.74	1.10	1.16	1.30	0.57
1989	.47	.14	.11	.000	.000	.001	.063	.26	.35	.44	.41	.27	.21
1990	.013	.000	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C20. Mean flow, in cubic feet per second, for station 06413570, Rapid Creek above Jackson Boulevard, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	23.1	22.0	19.8	19.5	20.6	17.9	28.4	64.5	88.5	115	74.8	54.9	45.8
1989	17.5	19.2	19.1	18.6	18.2	19.5	18.0	45.4	78.0	82.0	63.8	21.3	35.2
1990	16.6	18.3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C21. Mean flow, in cubic feet per second, for station 06413660, Storybook Ditch at headgate, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	(1)	(1)	(1)	(1)	(1)	(1)	3.70	5.20	5.36	4.73	3.72	2.15	(2)
1989	.85	2.01	2.49	2.21	1.60	.89	1.51	3.10	4.40	3.76	3.33	2.04	2.35
1990	1.29	1.88	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C22. Mean flow, in cubic feet per second, for station 06413670, Storybook Ditch at mouth, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	.69	1.23	2.47	3.13	1.80	1.99	2.82	4.10	4.24	3.26	2.32	1.02	2.43
1989	.51	1.43	1.81	1.93	1.20	.63	1.41	2.45	3.53	2.77	2.55	1.72	1.83
1990	.97	1.69	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C23. Mean flow, in cubic feet per second, for station 06414700, Rapid Creek at East Main Street, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1980	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	50.8	73.5	64.3	32.5	(2)
1981	22.3	24.6	26.0	24.4	26.4	24.2	19.0	84.7	43.4	89.9	43.1	55.7	40.5
1982	26.0	21.3	23.7	22.8	23.9	24.7	24.3	59.5	55.7	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C24. Mean flow, in cubic feet per second, for station 06415500, Hawthorne Ditch at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
[1]1946	0.19	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	14.6	8.96	(3)
[1]1947	7.37	(2)	(2)	(2)	(2)	(2)	0.01	18.9	9.33	10.3	17.9	19.3	(3)
[1]1948	14.5	(2)	(2)	(2)	(2)	(2)	12.4	13.1	9.65	12.8	13.5	20.2	(3)
[1]1949	4.2	(2)	(2)	(2)	(2)	(2)	0	10.8	12.2	17.6	14.1	8.91	(3)
[1]1950	2.67	(2)	(2)	(2)	(2)	(2)	0	3.33	19.3	20	16.1	11.8	(3)
[1]1951	6.83	(2)	(2)	(2)	(2)	(2)	0	15.8	15.3	10.6	12.2	9.63	(3)
[1]1952	14.2	(2)	(2)	(2)	(2)	(2)	0.79	23.7	15.7	15.3	18.1	12.5	(3)
[1]1953	(2)	(2)	(2)	(2)	(2)	(2)	0.057	8.37	16.2	18.7	10	12	(3)
[4]1981	(2)	(2)	(2)	(2)	(2)	(2)	(2)	18.7	8.61	15.2	4.39	13.7	(3)
[4]1982	9.91	(2)	(2)	(2)	(2)	(2)	(2)	0.47	3.39	(2)	(2)	(2)	(3)

[1]Only monthly values available for year.
[2]Indicates a no-value month.
[3]Incomplete water year.
[4]Daily values available for year.

Table C25. Mean flow, in cubic feet per second, for station 06416000, Rapid Creek below Hawthorne Ditch, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
[1]1946	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	62.6	73.8	(3)
[1]1947	87	65.4	55.3	49.7	48.6	62.7	118	97.4	296	198	70.2	44.7	99.5
[1]1948	49.7	55.2	50.1	47	53.4	69.6	73.9	55.1	76.5	80.3	62.3	35.5	59.1
[1]1949	44.5	55.7	43.2	40.6	49.2	76.2	105	79.8	110	50.3	47.9	38	61.6
[1]1950	43.7	43.8	32.7	33.7	35.9	42.6	115	135	53.2	51.7	30.6	35.8	54.5
[1]1951	35	41.2	36.5	32.9	36	41.1	39.3	34.9	54.9	44.8	41.6	38.7	39.7
[1]1952	36	37.2	35	34.1	36	41.7	74.6	285	133	55.1	31.9	26.8	69.1
[1]1953	28	26.2	34.5	37.6	36.4	51.1	65	107	99.2	43.9	63.1	35.8	52.4
[1]1954	35.6	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(3)
[4]1980	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	46.9	53.5	52.9	26.6	(3)
[4]1981	15.3	22.6	26.5	25.5	24	20.9	11.2	71.6	33.6	67	33.5	39.2	32.7
[4]1982	16	18.8	23.8	22.9	23.7	24.5	22.9	60.1	56	(2)	(2)	(2)	(3)

[1]Only monthly values available for year.
[2]Indicates a no-value month.
[3]Incomplete water year.
[4]Daily values available for year.

Table C26. Mean flow, in cubic feet per second, for station 06416300, Meade Street Drain at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1980	(1)	(1)	(1)	(1)	(1)	(1)	2.13	0.43	0.78	0.15	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C27. Mean flow, in cubic feet per second, for station 06422398, Boxelder Creek at Nemo

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1978	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	23.1	13.4	12.2	13.4	(2)
1979	7.69	(1)	(1)	(1)	(1)	(1)	11.4	6.20	4.55	6.37	4.25	2.89	(2)
1980	2.70	(1)	(1)	(1)	(1)	(1)	(1)	6.79	9.12	2.61	2.35	2.17	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C28. Mean flow, in cubic feet per second, for station 06422600, Boxelder Creek at Camp Columbus, near Nemo

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1978	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21.1	14.1	10.3	(2)
1979	9.10	(1)	(1)	(1)	(1)	(1)	12.1	8.12	8.42	11.0	7.59	4.36	(2)
1980	3.77	(1)	(1)	(1)	(1)	(1)	(1)	9.81	8.35	3.65	2.63	2.59	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C29. Mean flow, in cubic feet per second, for station 06422650, Boxelder Creek at Doty School, near Blackhawk

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1978	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	17.4	3.78	0.000	0.000	(2)
1979	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.000	.000	.000	.000	0.000
1980	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C30. Mean flow, in cubic feet per second, and statistics for station 06423000, Boxelder Creek at Blackhawk

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
[1]1903	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	14.6	10.6	6.60	(3)
[1]1904	2.71	.50	(2)	(2)	(2)	(2)	(2)	28.5	182	36.2	4.03	5.46	(3)
[1]1905	4.62	1.33	(2)	(2)	(2)	(2)	(2)	(2)	35.4	210	84.5	21.6	(3)
[1]1906	13.4	8.1	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(3)
[4]1945	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	2.00	3.68	.000	(3)
[4]1946	.000	.000	.000	.000	.000	.000	.000	132	123	25.3	.37	3.55	23.8
[4]1947	4.10	.55	.25	.000	.000	.06	38.2	13.4	65.5	33.8	(2)	(2)	(3)

[1]Only monthly values available for year.
[2]Indicates a no-value month.
[3]Incomplete water year.
[4]Daily values available for year.

Table C31. Mean flow, in cubic feet per second, for station 06424500, Elk Creek above Piedmont

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.56	15.4	(1)	(2)
1946	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.9	86.3	9.29	0.000	0.11	13.6
1947	.000	.000	.000	.000	.000	.000	10.2	4.08	26.8	5.16	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table C32. Mean flow, in cubic feet per second, for station 06430540, Cox Lake outlet near Beulah, WY

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1991	4.12	4.19	4.30	4.30	4.37	4.40	4.38	4.34	4.38	4.17	4.11	4.11	4.26
1992	4.14	4.30	4.30	4.30	4.30	4.31	4.29	4.10	4.06	4.07	3.97	3.98	4.18
1993	4.00	4.02	4.11	4.16	4.13	4.14	4.28	4.31	4.38	4.35	4.30	4.28	4.21

Section D - Tables of monthly flows and statistics for stations with 5 to 9 years of daily record

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Table D1. Mean flow, in cubic feet per second, and statistics for station 06394500, Beaver Creek near Burdock

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1905	5.00	10.0	13.0	13.0	15.0	51.0	19.0	22.2	66.4	553	196	10.6	82.4
1906	25.3	14.1	12.0	12.0	12.0	260	55.3	131	155	13.4	4.90	18.8	59.9
1907	15.5	21.6	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
1929	8.00	10.0	8.00	3.00	7.00	278	277	401	325	167	46.8	50.2	132
1930	29.5	16.2	8.00	7.00	209	81.2	48.2	33.8	137	6.90	189	29.5	65.2
1931	99.7	24.2	20.0	20.3	33.2	38.9	31.1	8.19	45.8	.71	.90	2.50	27.1
1932	32.1	18.7	17.0	15.0	50.0	75.0	176	106	211	(1)	(1)	(1)	(2)
Maximum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mean	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D2. Mean flow, in cubic feet per second, and statistics for station 06404800, Grace Coolidge Creek near Hayward

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1989	(1)	(1)	(1)	(1)	0.056	0.20	0.30	0.27	0.24	0.096	0.060	1.57	(2)
1990	1.15	.62	.34	.26	.14	.88	1.79	8.81	7.29	1.54	.85	.28	2.01
1991	.24	.24	.17	.12	.19	.25	1.67	18.0	18.4	2.02	.92	.47	3.57
1992	.48	.41	.24	.19	.17	.39	.42	.37	1.61	2.89	1.59	1.00	.82
1993	.50	.28	.22	.21	.21	.96	3.85	7.90	11.9	3.33	1.53	.89	2.65
1989-93													
Maximum	(3)	(3)	(3)	(3)	0.21	0.96	3.85	18.0	18.4	3.33	1.59	1.57	(3)
Minimum	(3)	(3)	(3)	(3)	.056	.20	.30	.27	.24	.096	.060	.28	(3)
Mean	(3)	(3)	(3)	(3)	.15	.54	1.61	7.07	7.89	1.98	.99	.84	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D3. Mean flow, in cubic feet per second, and statistics for station 06405500, Grace Coolidge Creek near Hermosa

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.000	0.000	0.000	(2)
1946	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.000	.000	.000	0.000
1947	.000	.000	.000	.000	.000	.000	.000	.000	17.7	4.68	(1)	(1)	(2)
1978	(1)	(1)	(1)	(1)	(1)	(1)	.000	12.8	.22	.000	.000	.000	(2)
1979	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.69	.21	.000	.16
1980	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
Maximum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mean	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D4. Mean flow, in cubic feet per second, and statistics for station 06405800, Bear Gulch near Hayward

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	(1)	(1)	(1)	(1)	(1)	0.064	0.000	0.000	0.18	0.27	0.061	4.71	(2)
1990	0.60	0.11	0.004	0.000	0.000	.13	.084	3.90	2.79	1.98	.53	.003	0.85
1991	.000	.000	.000	.000	.000	.000	1.79	6.68	5.72	1.49	.34	.11	1.35
1992	.080	.000	.000	.000	.000	.054	.14	.45	1.66	2.01	.66	.12	.43
1993	.022	.023	.000	.000	.000	.31	2.57	8.03	8.38	1.33	.73	.55	1.83
1989-93													
Maximum	(3)	(3)	(3)	(3)	(3)	0.31	2.57	8.03	8.38	2.01	0.73	4.71	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	.00	.00	.00	.18	.27	.061	.003	(3)
Mean	(3)	(3)	(3)	(3)	(3)	.12	.79	3.30	3.14	1.19	.40	.92	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D5. Mean flow, in cubic feet per second, and statistics for station 06406500, Battle Creek below Hermosa

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1951	0.18	3.02	1.86	1.91	2.98	5.35	1.30	0.91	14.6	13.4	0.96	5.03	4.28
1952	3.05	3.12	2.45	2.35	3.98	4.55	1.20	188	30.8	7.74	.31	.000	20.9
1953	.000	.71	1.43	2.96	3.53	6.19	2.53	6.16	13.9	.45	21.8	.010	5.00
1989	.000	.000	.000	.000	.000	2.76	1.17	.71	.032	.000	.000	.051	.40
1990	.001	.000	.000	.000	.009	.44	.59	9.54	33.0	3.48	.84	.003	3.98
1991	.000	.97	1.41	.90	2.85	2.83	3.08	64.9	152	17.5	8.11	4.71	21.6
1992	4.39	7.31	8.22	5.78	4.74	5.80	5.01	3.75	4.02	3.00	1.48	1.39	4.58
1993	2.83	4.21	2.91	3.14	3.75	5.34	8.07	79.4	143	35.8	19.8	18.2	27.2
1989-93													
Maximum	4.39	7.31	8.22	5.78	4.74	5.80	8.07	79.4	152	35.8	19.8	18.2	27.2
Minimum	.000	.000	.000	.000	.000	.44	.59	.71	.032	.000	.000	.051	.40
Mean	1.44	2.50	2.51	1.96	2.27	3.43	3.58	31.66	66.41	11.96	6.05	4.87	10.99

Table D6. Mean flow, in cubic feet per second, and statistics for station 06408860, Rapid Creek near Rochford

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1989	10.2	9.60	9.20	8.81	8.20	16.7	16.1	20.2	12.7	8.14	8.15	9.26	11.5
1990	8.97	9.39	7.15	7.39	7.04	12.8	23.3	25.0	14.4	9.57	8.27	7.71	11.8
1991	8.45	7.91	7.68	11.9	10.8	14.5	20.9	42.0	58.6	21.3	11.5	9.94	18.8
1992	11.5	11.7	10.9	11.0	12.2	16.0	16.2	15.7	15.2	15.3	10.5	8.51	12.9
1993	8.59	8.90	9.10	8.08	7.53	15.2	23.8	57.0	96.3	37.4	21.1	17.0	25.9
1989-93													
Maximum	11.5	11.7	10.9	11.9	12.2	16.7	23.8	57.0	96.3	37.4	21.1	17.0	25.9
Minimum	8.45	7.91	7.15	7.39	7.04	12.8	16.1	15.7	12.7	8.14	8.15	7.71	11.5
Mean	9.54	9.50	8.81	9.44	9.15	15.04	20.06	31.98	39.44	18.34	11.90	10.48	16.18

Table D7. Mean flow, in cubic feet per second, and statistics for station 06412200, Rapid Creek above Victoria Creek

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	94.9	69.8	53.3	(2)
1989	14.9	13.4	12.5	12.5	8.57	14.9	18.4	49.8	85.6	88.0	67.9	22.8	34.3
1990	16.4	15.1	14.7	15.1	11.0	13.9	16.0	49.0	30.0	82.9	48.7	29.8	28.8
1991	10.7	10.8	12.6	10.2	10.4	11.1	14.0	29.3	47.3	52.1	67.2	40.3	26.4
1992	18.0	19.5	19.1	21.2	24.7	21.7	20.7	75.7	40.1	33.6	74.3	35.3	33.7
1993	23.0	16.4	15.2	17.5	16.0	20.4	21.5	33.3	208	148	66.5	66.7	54.5
1989-93													
Maximum	23.0	19.5	19.1	21.2	24.7	21.7	21.5	75.7	208	148	74.3	66.7	54.5
Minimum	10.7	10.8	12.5	10.2	8.57	11.1	14.0	29.3	30.0	33.6	48.7	22.8	26.4
Mean	16.60	15.04	14.82	15.30	14.13	16.40	18.12	47.42	82.20	80.92	64.92	38.98	35.54

[1]Indicates a no-value month.
[2]Incomplete water year.

Table D8. Mean flow, in cubic feet per second, and statistics for station 06412600, Cleghorn Springs main channel at Fish Hatchery, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	8.56	8.16	9.65	9.96	9.83	9.89	9.43	9.61	9.32	10.6	11.0	10.8	9.74
1989	9.86	10.0	9.89	9.25	8.82	8.89	8.89	9.43	8.90	8.72	8.95	8.92	9.22
1990	9.13	9.56	9.76	9.37	9.06	8.79	9.19	9.60	9.13	9.22	8.65	8.52	9.17
1991	8.16	8.44	8.47	8.74	8.84	8.61	8.71	9.20	9.35	9.09	9.77	9.99	8.95
1992	9.80	9.50	8.82	8.85	8.82	8.91	9.21	9.61	9.10	9.43	9.12	9.15	9.19
1988-92													
Maximum	9.86	10.0	9.89	9.96	9.83	9.89	9.43	9.61	9.35	10.6	11.0	10.8	9.74
Minimum	8.16	8.16	8.47	8.74	8.82	8.61	8.71	9.20	8.90	8.72	8.65	8.52	8.95
Mean	9.10	9.13	9.32	9.23	9.07	9.02	9.09	9.49	9.16	9.41	9.50	9.48	9.25

Table D9. Mean flow, in cubic feet per second, and statistics for station 06412700, Cleghorn Springs south channel at Fish Hatchery, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	1.43	1.46	1.06	.93	1.04	1.01	1.08	1.14	1.07	1.04	1.06	0.99	1.11
1989	.98	1.00	.92	.88	.96	.90	.88	.97	1.06	1.06	1.03	.96	.97
1990	.90	.99	1.01	.95	.89	.90	.85	.96	.93	.98	.94	.91	.93
1991	.88	.92	.91	.83	.83	.82	.82	.89	.93	.86	.86	.83	.87
1992	.84	.82	.82	.82	.80	.81	.83	.87	.87	.88	.87	.86	.84
1988-92													
Maximum	1.43	1.46	1.06	.95	1.04	1.01	1.08	1.14	1.07	1.06	1.06	.99	1.11
Minimum	.84	.82	.82	.82	.80	.81	.82	.87	.87	.86	.86	.83	.84
Mean	1.01	1.04	.94	.88	.90	.89	.89	.97	.97	.96	.95	.91	.94

Table D10. Mean flow, in cubic feet per second, and statistics for station 06412800, Cleghorn Springs north channel at Fish Hatchery, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	1.00	1.75	1.00	1.05	0.66	0.60	0.77	1.10	1.22	1.41	1.03	0.88	1.04
1989	.70	.85	.82	.90	.94	.81	.99	1.13	1.30	1.13	1.15	.94	.97
1990	.86	.78	.71	.82	.87	.89	.77	1.13	1.10	1.10	1.00	.91	.91
1991	.94	.87	.89	.89	1.04	.77	.76	1.24	1.50	1.51	1.28	1.25	1.08
1992	1.29	.92	.99	.87	.95	.65	.51	.97	.88	1.19	.65	.67	.88
1988-92													
Maximum	1.29	1.75	1.00	1.05	1.04	.89	.99	1.24	1.50	1.51	1.28	1.25	1.08
Minimum	.70	.78	.71	.82	.66	.60	.51	.97	.88	1.10	.65	.67	.88
Mean	.96	1.03	.88	.91	.89	.74	.76	1.11	1.20	1.27	1.02	.93	.98

Table D11. Mean flow, in cubic feet per second, and statistics for station 06412900, Rapid Creek below Cleghorn Springs, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1988	24.1	23.8	21.3	21.0	23.8	23.7	35.1	66.0	92.8	117	83.4	58.7	49.3
1989	20.9	21.1	19.8	17.9	17.1	18.5	21.9	54.9	93.9	97.0	72.3	36.2	41.1
1990	19.8	21.5	20.1	19.8	17.7	17.0	16.2	51.7	34.5	87.6	55.0	37.4	33.4
1991	15.9	15.1	15.9	15.7	17.0	15.3	16.9	45.0	62.2	61.6	81.1	47.8	34.3
1992	21.8	20.6	21.4	21.8	23.4	24.7	26.1	67.4	45.6	42.3	65.3	44.2	35.5
1993	28.8	18.2	18.0	21.1	21.8	22.3	29.2	53.5	249	152	77.3	80.9	64.4
1988-93													
Maximum	28.8	23.8	21.4	21.8	23.8	24.7	35.1	67.4	249	152	83.4	80.9	64.4
Minimum	15.9	15.1	15.9	15.7	17.0	15.3	16.2	45.0	34.5	42.3	55.0	36.2	33.4
Mean	21.88	20.05	19.42	19.55	20.13	20.25	24.23	56.42	96.33	92.92	72.40	50.87	43.00

Table D12. Mean flow, in cubic feet per second, and statistics for station 06413650, Lime Creek at mouth, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1981	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.62	1.64	1.88	1.18	0.76	(2)
1982	1.41	(1)	(1)	(1)	(1)	(1)	(1)	2.67	2.77	(1)	(1)	(1)	(2)
1988	1.76	2.15	2.15	1.91	1.96	1.99	1.60	1.65	1.18	1.00	1.74	.67	1.65
1989	.84	1.10	.99	1.13	1.10	1.14	.95	1.04	.73	.80	1.13	.97	.99
1990	.90	.81	.69	.99	1.18	.85	1.54	1.37	.88	1.23	1.39	.35	1.02
1991	.32	.35	.45	.23	.34	.40	1.13	3.24	2.69	1.98	1.18	.92	1.11
1992	.91	.67	.57	.51	.54	.76	.63	.74	.71	.84	.31	.20	.62
1993	.19	.23	.25	.25	.25	.74	1.48	3.09	3.05	3.06	2.86	2.24	1.48
1988-93													
Maximum	1.76	2.15	2.15	1.91	1.96	1.99	1.60	3.24	3.05	3.06	2.86	2.24	1.65
Minimum	.19	.23	.25	.23	.25	.40	.63	.74	.71	.80	.31	.20	.62
Mean	.82	.89	.85	.84	.90	.98	1.22	1.86	1.54	1.48	1.43	.89	1.14

[1]Indicates a no-value month.

[2]Incomplete water year.

Table D13. Mean flow, in cubic feet per second, and statistics for station 06413700, Rapid Creek above Water Treatment Plant, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1980	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	57.1	92.9	68.1	35.4	(2)
1981	20.8	22.3	23.1	20.7	22.1	20.2	19.7	81.7	41.9	80.5	38.4	53.7	37.2
1982	17.5	17.8	20.2	19.4	20.3	20.7	19.3	44.5	43.6	(1)	(1)	(1)	(2)
1988	25.4	25.2	21.8	22.6	23.8	24.1	34.2	61.7	87.3	105	74.8	55.4	46.8
1989	18.1	21.1	20.3	18.4	18.9	21.0	18.8	48.2	85.0	87.5	59.1	21.4	36.6
1990	20.1	20.0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
Maximum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mean	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D14. Mean flow, in cubic feet per second, and statistics for station 06413800, Deadwood Avenue Drain at mouth, at Rapid City

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1981	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.93	2.75	3.26	2.56	2.01	(2)
1982	2.39	(1)	(1)	(1)	(1)	(1)	(1)	4.04	3.33	(1)	(1)	(1)	(2)
1987	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.05	3.15	(2)
1988	2.77	2.88	2.97	2.99	2.52	2.73	2.69	2.54	2.53	2.05	1.96	2.19	2.57
1989	2.24	2.55	2.46	2.53	2.44	2.48	2.35	2.33	2.07	2.20	2.51	2.74	2.41
1990	2.39	2.35	2.73	2.67	2.32	2.54	2.18	2.39	2.57	2.15	2.56	2.18	2.42
Maximum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mean	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D15. Mean flow, in cubic feet per second, and statistics for station 06422000, Rapid Creek at Creston

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1929	(1)	(1)	(1)	(1)	(1)	(1)	(1)	358	651	200	60.3	72.0	(2)
1930	114	129	(1)	(1)	(1)	209	180	136	33.9	.48	14.1	17.0	(2)
1931	103	76.8	84.8	(1)	87.0	76.1	94.7	41.2	6.30	2.55	.000	.000	(2)
1932	17.5	39.6	(1)	(1)	(1)	216	184	420	104	(1)	(1)	(1)	(2)
1990	30.1	37.2	29.0	36.2	41.0	39.8	18.9	58.9	28.6	20.4	15.0	17.9	31.1
Maximum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mean	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D16. Mean flow, in cubic feet per second, and statistics for station 06424000, Elk Creek near Roubaix

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	12.3	4.07	3.33	(2)
1946	2.55	2.31	1.50	1.73	2.74	7.93	9.20	60.4	58.8	14.5	4.88	6.11	14.4
1947	6.79	4.46	3.84	3.00	5.56	6.17	25.0	15.8	39.2	17.1	(1)	(1)	(2)
1992	2.17	1.92	2.16	2.04	2.37	3.45	4.79	4.78	5.04	3.74	2.00	1.40	2.99
1993	1.05	1.74	1.08	.96	.90	5.53	10.9	28.4	31.0	11.7	4.77	3.38	8.48
Maximum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mean	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

Table D17. Mean flow, in cubic feet per second, and statistics for station 06429997, Murray Ditch above headgate, at Wyoming-South Dakota State line

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1987	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.000	7.84	10.6	13.9	5.73	(2)
1988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.84	13.9	8.58	14.5	12.8	4.54
1989	7.58	.58	.000	.000	.000	.000	.054	.003	7.46	14.4	7.63	16.4	4.53
1990	1.04	.000	.000	.000	.000	.000	.000	.000	10.3	12.2	5.92	8.67	3.18
1991	20.6	.000	.000	.000	.000	.000	.000	.015	.000	16.4	18.2	1.85	4.83
1992	10.6	.15	.000	.000	.000	.000	.000	6.30	11.4	7.72	6.62	6.31	4.11
1993	1.49	.000	.000	.000	.000	.000	.000	.000	3.09	1.84	3.71	.80	.92
1988-93													
Maximum	20.6	.58	.000	.000	.000	.000	.054	6.30	13.9	16.4	18.2	16.4	4.83
Minimum	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.84	3.71	.80	.92
Mean	6.87	.12	.000	.000	.000	.000	.009	1.86	7.69	10.2	9.42	7.80	3.69

[1]Indicates a no-value month.
[2]Incomplete water year.

Table D18. Mean flow, in cubic feet per second, and statistics for station 06430770, Spearfish Creek near Lead

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	15.0	14.6	15.5	14.3	12.9	14.1	15.0	20.9	16.6	13.4	13.7	14.5	15.1
1990	15.0	16.7	13.7	12.2	11.4	12.1	17.0	21.9	16.1	12.5	10.3	11.1	14.2
1991	13.0	13.3	11.9	12.4	13.3	12.7	15.8	22.3	23.4	17.1	14.5	13.2	15.2
1992	14.9	14.2	13.6	12.6	13.8	15.1	16.5	16.5	17.0	17.0	15.3	15.2	15.1
1993	14.2	16.5	14.8	14.9	13.7	14.0	18.2	22.9	26.9	20.6	20.1	20.8	18.1
1989-93													
Maximum	15.0	16.7	15.5	14.9	13.8	15.1	18.2	22.9	26.9	20.6	20.1	20.8	18.1
Minimum	13.0	13.3	11.9	12.2	11.4	12.1	15.0	16.5	16.1	12.5	10.3	11.1	14.2
Mean	14.4	15.1	13.9	13.3	13.0	13.6	16.5	20.9	20.0	16.1	14.8	15.0	15.6

Table D19. Mean flow, in cubic feet per second, and statistics for station 06430800, Annie Creek near Lead

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	0.12	0.12	.045	0.10	0.17	0.26	1.30	4.71	0.68	0.34	0.12	0.11	0.68
1990	.10	.28	.19	.097	.14	.58	2.40	4.85	.91	.39	.25	.15	.87
1991	.17	.16	.13	.11	.077	.082	.75	5.68	2.48	.49	.19	.14	.88
1992	.14	.14	.14	.16	.19	.22	.97	1.63	.60	.27	.10	.061	.38
1993	.052	.10	.17	.010	.000	.35	2.15	4.50	4.65	1.48	.79	.42	1.23
1989-93													
Maximum	.17	.28	.19	.16	.19	.58	2.40	5.68	4.65	1.48	.79	.42	1.23
Minimum	.052	.10	.045	.010	.000	.082	.75	1.63	.60	.27	.10	.061	.38
Mean	.12	.16	.13	.10	.12	.30	1.51	4.27	1.86	.59	.29	.18	.81

Table D20. Mean flow, in cubic feet per second, and statistics for station 06430850, Little Spearfish Creek near Lead

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	14.8	14.3	14.1	14.0	13.7	14.0	14.0	14.9	13.7	13.1	13.7	14.0	14.0
1990	13.8	13.0	12.9	12.6	12.1	12.5	14.1	14.7	13.7	13.1	13.0	12.9	13.2
1991	13.6	12.3	12.2	11.5	11.1	12.2	13.6	15.5	15.3	13.8	13.0	12.0	13.0
1992	12.2	12.9	12.3	12.5	13.0	12.4	12.5	13.1	13.9	12.6	12.9	13.0	12.8
1993	12.3	11.1	10.3	9.96	11.0	12.4	12.0	13.6	15.2	14.9	13.7	13.1	12.5
1989-93													
Maximum	14.8	14.3	14.1	14.0	13.7	14.0	14.1	15.5	15.3	14.9	13.7	14.0	14.0
Minimum	12.2	11.1	10.3	9.96	11.0	12.2	12.0	13.1	13.7	12.6	12.9	12.0	12.5
Mean	13.34	12.72	12.36	12.11	12.18	12.70	13.24	14.36	14.36	13.50	13.26	13.00	13.10

Table D21. Mean flow, in cubic feet per second, and statistics for station 06430898, Squaw Creek near Spearfish

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	1.02	0.75	0.57	0.39	0.62	1.25	4.18	12.2	1.86	1.10	0.45	0.58	2.09
1990	.60	.94	.74	.52	.50	1.73	5.60	9.61	2.07	.93	.45	.42	2.02
1991	.38	.39	.41	.38	.32	.57	3.28	12.6	5.32	1.21	.42	.36	2.15
1992	.37	.54	.38	.36	.42	.92	3.25	2.65	1.31	.98	.38	.32	.99
1993	.35	.47	.32	.34	.42	1.67	7.67	11.7	9.78	2.51	1.39	1.01	3.14
1989-93													
Maximum	1.02	.94	.74	.52	.62	1.73	7.67	12.6	9.78	2.51	1.39	1.01	3.14
Minimum	.35	.39	.32	.34	.32	.57	3.25	2.65	1.31	.93	.38	.32	.99
Mean	.54	.62	.48	.40	.46	1.23	4.80	9.75	4.07	1.35	.62	.54	2.08

Table D22. Mean flow, in cubic feet per second, and statistics for station 06430900, Spearfish Creek above Spearfish

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	43.3	41.7	41.4	41.2	39.2	43.8	51.1	71.5	46.5	39.8	36.8	39.1	44.7
1990	38.8	39.2	36.9	37.6	37.4	40.8	58.7	74.7	48.3	37.7	36.7	36.4	43.6
1991	36.4	37.2	36.0	38.0	37.9	39.8	47.0	81.7	63.9	43.6	37.8	34.9	44.6
1992	36.7	38.4	29.8	31.8	37.9	39.8	44.8	45.3	41.4	39.4	35.9	36.0	38.1
1993	35.5	37.3	38.3	37.2	37.0	39.5	60.4	78.7	103	53.5	43.9	42.7	50.6
1989-93													
Maximum	43.3	41.7	41.4	41.2	39.2	43.8	60.4	81.7	103	53.5	43.9	42.7	50.6
Minimum	35.5	37.2	29.8	31.8	37.0	39.5	44.8	45.3	41.4	37.7	35.9	34.9	38.1
Mean	38.14	38.76	36.48	37.16	37.88	40.74	52.40	70.38	60.62	42.80	38.22	37.82	44.32

Table D23. Mean flow, in cubic feet per second, and statistics for station 06432020, Spearfish Creek below Spearfish

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	49.5	56.5	49.5	45.4	37.1	52.2	54.9	63.0	31.7	8.79	5.80	30.5	40.4
1990	48.6	48.9	38.3	48.7	47.2	47.3	55.7	68.6	32.3	4.48	6.65	22.4	39.0
1991	36.8	46.9	32.5	28.0	44.7	44.5	52.1	82.6	67.2	9.68	7.41	29.2	40.0
1992	40.9	53.6	46.5	40.6	41.5	49.2	47.2	21.4	16.0	18.3	14.2	30.7	35.0
1993	38.9	45.8	39.8	35.6	41.0	50.4	59.4	76.0	80.9	58.5	41.4	44.5	51.0
1989-93													
Maximum	49.5	56.5	49.5	48.7	47.2	52.2	59.4	82.6	80.9	58.5	41.4	44.5	51.0
Minimum	36.8	45.8	32.5	28.0	37.1	44.5	47.2	21.4	16.0	4.48	5.80	22.4	35.0
Mean	42.94	50.34	41.32	39.66	42.30	48.72	53.86	62.32	45.62	19.95	15.09	31.46	41.08

Table D24. Mean flow, in cubic feet per second, and statistics for station 06436156, Whitetail Creek at Lead

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	1.21	1.10	1.04	0.97	0.88	1.68	3.87	11.8	3.47	2.20	1.24	1.11	2.56
1990	.99	1.12	.91	.93	.91	1.89	5.41	10.4	3.11	1.53	.97	.74	2.42
1991	.74	.74	.43	.50	.70	1.15	2.87	10.6	7.35	2.38	1.20	.82	2.47
1992	.93	.93	.90	.82	1.00	1.53	2.95	4.81	2.68	1.86	1.20	.89	1.71
1993	.80	.87	.85	.76	.63	1.47	5.03	12.0	10.3	4.52	2.55	1.68	3.47
1989-93													
Maximum	1.21	1.12	1.04	.97	1.00	1.89	5.41	12.0	10.3	4.52	2.55	1.68	3.47
Minimum	.74	.74	.43	.50	.63	1.15	2.87	4.81	2.68	1.53	.97	.74	1.71
Mean	.93	.95	.83	.80	.82	1.54	4.03	9.92	5.38	2.50	1.43	1.05	2.53

Table D25. Mean flow, in cubic feet per second, and statistics for station 06436500, Horse Creek near Newell

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1962	(1)	(1)	(1)	(1)	(1)	(1)	0.19	75.6	31.5	0.21	0.023	0.017	(2)
1963	0.18	0.023	0.000	0.035	0.021	0.35	2.05	.53	6.69	1.41	.57	.067	0.99
1964	.10	.020	.000	.000	.000	.000	.017	.35	37.8	1.90	.016	.000	3.30
1965	.000	.023	.000	.000	.000	.13	1.16	150	1.94	4.99	.094	.013	13.4
1966	.039	.000	.000	.000	.000	4.68	1.39	.026	.003	.14	.023	.080	.54
1967	.089	.013	.036	.074	.39	4.70	.25	40.7	11.2	1.07	.15	1.21	5.05
1968	.29	.25	.008	.036	.009	.48	.057	.12	1.26	.22	.097	.12	.25
1969	.010	.006	.004	.003	.000	.50	6.26	2.46	.31	4.37	.10	.027	1.17
1963-69													
Maximum	.29	.25	.036	.074	.39	4.70	6.26	150	37.8	4.99	.57	1.21	.54
Minimum	.000	.000	.000	.000	.000	.000	.017	.026	.003	.14	.016	.000	.25
Mean	.10	.05	.01	.02	.06	1.55	1.60	27.74	8.46	2.01	.15	.22	3.53

[1]Indicates a no-value month.
[2]Incomplete water year.

Table D26. Mean flow, in cubic feet per second, and statistics for station 06437020, Bear Butte Creek near Deadwood

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1989	1.21	1.01	0.86	0.81	0.77	2.69	4.38	13.9	3.20	1.43	1.07	1.23	2.74
1990	1.25	2.12	1.37	1.31	1.23	2.48	9.34	13.7	3.45	1.82	.94	.31	3.29
1991	.84	.82	.28	.30	.45	2.62	7.23	21.1	44.7	4.16	2.05	1.14	7.12
1992	1.23	1.47	1.29	1.10	1.72	3.35	4.89	6.09	3.32	1.69	.66	.63	2.29
1993	.69	.82	.72	.81	.72	4.02	12.1	24.8	32.1	8.55	3.63	2.35	7.61
1989-93													
Maximum	1.25	2.12	1.37	1.31	1.72	4.02	12.1	24.8	44.7	8.55	3.63	2.35	7.61
Minimum	.69	.82	.28	.30	.45	2.48	4.38	6.09	3.20	1.43	.66	.31	2.29
Mean	1.04	1.25	.90	.87	.98	3.03	7.59	15.92	17.35	3.53	1.67	1.13	4.61

Table D27. Mean flow, in cubic feet per second, and statistics for station 06437200, Bear Butte Creek near Galena

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1965	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.45	(2)
1966	0.60	0.020	0.000	0.000	0.000	1.48	13.1	10.1	0.000	0.055	0.006	.070	2.13
1967	.000	.000	.000	.000	.000	1.68	13.7	33.2	97.3	2.00	.000	.12	12.3
1968	.000	.000	.000	.000	.000	.014	.000	.000	10.1	6.70	.54	.081	1.45
1969	.000	.000	.000	.000	.000	.000	18.6	29.0	1.79	1.20	.000	.000	4.25
Maximum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Minimum	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mean	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Statistic not computed.

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Section E - Tables of monthly flows and statistics for stations with 10 or more years of daily record

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Table E1.1. Mean flow, in cubic feet per second, for station 06395000, Cheyenne River at Edgemont

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1903	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1,034	795	385	(2)
1904	(1)	(1)	(1)	(1)	(1)	(1)	26.7	610	1,106	695	69.8	57.0	(2)
1905	26.9	(1)	(1)	(1)	(1)	195	50.5	245	1,021	2,025	1,266	47.0	(2)
1906	56.5	28.9	(1)	(1)	(1)	(1)	(1)	601	325	34.9	477	353	(2)
1907	6.06	8.40	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
1928	(1)	(1)	(1)	(1)	(1)	(1)	(1)	60.6	338	861	215	50.2	(2)
1929	20.9	20.2	(1)	(1)	(1)	790	785	906	785	319	117	95.4	(2)
1930	41.6	16.6	(1)	(1)	335	108	64.4	96.2	267	8.90	611	136	(2)
1931	302	29.1	(1)	(1)	41.6	45.2	38.9	21.7	386	28.1	503	1.93	(2)
1932	180	12.8	(1)	(1)	213	496	494	480	355	217	486	7.23	(2)
1933	12.0	11.8	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
1947	66.9	22.6	10.5	2.37	60.5	55.2	60.8	22.8	302	223	41.0	3.48	72.4
1948	3.84	10.5	6.13	2.58	20.8	298	17.1	49.0	431	221	171	1.13	103
1949	5.88	10.6	8.00	1.61	77.2	321	72.0	117	210	8.38	21.3	6.80	71.7
1950	9.27	2.56	.077	.000	5.59	20.8	86.5	98.3	81.8	145	3.30	2.80	38.2
1951	6.85	3.39	.87	.084	1.56	16.7	12.0	1.28	204	363	262	265	95.2
1952	4.43	4.50	.64	.19	3.16	38.4	32.9	437	482	152	57.4	.13	101
1953	.19	.23	.23	1.15	6.57	177	15.0	112	214	11.0	154	1.33	58.1
1954	.11	2.19	2.74	1.92	13.1	15.2	4.45	46.1	6.99	19.8	131	.017	20.5
1955	.039	.087	.15	.084	.11	180	558	225	275	22.2	388	82.3	144
1956	3.05	1.58	26.8	8.45	66.8	117	8.48	90.8	166	7.85	28.1	.000	43.7
1957	1.26	8.83	2.12	.035	26.6	58.0	4.00	515	487	79.2	99.3	25.7	109
1958	3.26	17.4	4.13	1.31	8.54	34.3	102	5.16	98.7	806	132	.37	102
1959	.35	2.89	.51	.097	.51	62.5	6.10	4.49	163	47.7	3.76	.26	24.3
1960	.094	.070	.000	.000	.000	103	1.50	.27	83.2	7.73	.000	.000	16.4
1961	.000	.063	.11	.000	6.84	3.39	.22	3.34	10.1	74.7	53.5	.65	12.9
1962	.003	.023	.029	.039	64.6	83.6	1.33	2,176	2,084	638	133	6.43	434
1963	21.0	8.58	10.3	.75	118	57.8	61.4	158	608	71.2	1.71	93.5	99.7
1964	.82	2.29	2.65	.000	1.03	28.0	55.8	63.1	450	62.3	1.93	1.11	55.3
1965	2.30	3.39	3.50	6.21	15.9	39.2	47.7	322	925	254	47.1	23.3	141
1966	38.8	10.3	8.77	4.18	2.37	160	34.1	10.5	1.76	239	229	17.1	64.0
1967	45.1	20.1	18.0	16.0	52.7	118	62.1	152	740	165	10.4	18.8	118
1968	8.84	16.7	14.7	6.06	17.7	105	24.3	22.0	256	27.7	59.6	37.5	49.5
1969	11.0	11.2	3.73	2.22	1.84	115	51.5	111	133	758	27.4	2.69	104
1970	7.45	6.85	9.58	6.37	24.5	71.5	81.6	90.0	51.7	8.49	8.98	1.91	30.7
1971	11.6	10.8	6.55	1.95	28.1	99.3	336	1,229	770	32.6	2.42	2.24	212
1972	23.4	21.6	9.77	2.89	26.7	155	26.2	35.3	139	16.0	32.3	7.71	41.4
1973	11.7	16.6	3.66	7.02	13.6	49.6	50.0	317	81.7	116	16.4	275	80.1
1974	36.9	37.6	12.9	34.0	65.4	104	35.4	13.0	1.94	1.01	7.39	.15	29.0
1975	2.20	23.0	8.72	1.25	9.43	73.3	162	54.3	103	27.3	4.26	.31	39.0
1976	5.48	8.81	9.71	4.52	13.2	39.6	14.7	22.3	254	39.3	43.2	.42	37.7
1977	3.73	13.1	4.13	.68	25.3	70.6	61.7	6.72	29.6	69.1	16.6	26.0	27.2
1978	11.9	9.40	8.00	4.14	7.62	304	46.1	2,192	243	506	295	22.2	309
1979	16.5	21.2	11.9	4.27	5.08	255	118	32.4	77.9	146	304	19.0	85.2
1980	10.7	17.9	6.48	8.50	119	131	36.2	15.9	76.3	6.24	115	5.37	45.4
1981	6.49	7.31	11.9	29.6	37.4	19.1	3.01	10.2	23.3	236	70.7	2.46	38.5
1982	8.64	11.3	10.0	4.79	94.5	177	26.0	45.1	342	141	112	72.2	86.7
1983	86.1	51.0	32.3	31.1	141	62.8	62.7	49.9	48.2	58.8	37.4	3.79	54.9
1984	16.4	15.9	4.33	30.2	156	295	87.8	427	128	29.4	34.8	4.84	103
1985	15.5	19.1	9.92	8.85	14.9	108	23.5	6.30	4.00	.15	.22	1.37	17.7
1986	1.93	2.29	.80	10.0	44.3	229	149	155	377	106	15.6	124	101
1987	202	28.8	24.2	26.3	37.7	379	105	97.6	126	21.6	4.64	3.78	88.8
1988	2.98	8.46	5.55	6.92	9.00	47.3	14.4	8.75	15.5	2.82	19.5	2.59	12.0
1989	2.43	.84	1.03	1.16	.16	27.8	14.4	64.9	4.10	11.6	.19	155	23.6
1990	4.09	11.9	7.80	13.7	23.2	94.7	31.5	58.2	19.7	79.6	24.5	7.78	31.6
1991	16.2	9.48	4.84	.41	.87	21.3	23.3	991	1,038	70.8	16.1	5.71	184
1992	11.0	10.9	8.45	10.1	20.9	33.2	8.91	5.87	11.8	27.3	5.91	1.15	13.0
1993	.45	5.75	3.49	3.50	2.29	208	106	192	215	178	182	23.8	94.2

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E1.2. Statistics on mean flow, in cubic feet per second, for station 06395000, Cheyenne River at Edgemont (October 1946 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	47	47	47	47	47	47	47	47	47	47	47	47	47
Maximum	202	51.0	32.3	34.0	156	379	558	2,192	2,084	806	388	275	434
Percentile													
75th	15.5	16.7	9.92	8.45	44.3	160	72.0	158	342	165	115	23.3	102
50th	6.49	9.48	6.13	2.89	15.9	83.6	35.4	58.2	139	69.1	32.3	3.79	64.0
25th	2.20	2.89	2.12	0.68	5.08	39.2	14.4	13.0	48.2	19.8	7.39	1.13	31.6
Minimum	0.000	0.023	0.000	0.000	0.000	3.39	0.22	0.27	1.76	0.15	0.000	0.000	12.0
Mean	15.94	11.28	7.25	6.54	31.75	111.96	62.61	231.10	267.94	134.78	72.87	28.92	82.20
Standard deviation	32.64	10.26	7.04	9.12	39.18	94.07	93.74	480.64	368.48	190.00	93.71	61.22	77.37
Skewness	4.50	1.67	1.70	1.96	1.72	1.20	3.89	3.30	3.07	2.33	1.73	3.05	2.73
Coefficient of variation	2.05	0.91	0.97	1.39	1.23	0.84	1.50	2.08	1.38	1.41	1.29	2.12	0.94
Percent of annual flow	1.62	1.15	0.74	0.67	3.23	11.39	6.37	23.51	27.26	13.71	7.41	2.94	[1]-0.178

[1]Serial correlation for annual mean flows.

Table E1.3. Serial correlation for 1-year lag for monthly mean flow for station 06395000, Cheyenne River at Edgemont (October 1946 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.059	0.301	-0.006	0.250	0.307	0.139	-0.121	-0.150	-0.014	-0.078	0.183	-0.175

Table E1.4. Correlation matrix for monthly mean flow for station 06395000, Cheyenne River at Edgemont (October 1946 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.610	0.627	0.518	0.267	0.358	0.040	-0.081	-0.084	-0.086	-0.141	-0.096
Nov.	*	1.000	.697	.631	.454	.183	.004	-.165	-.232	-.081	-.168	-.142
Dec.	*	*	1.000	.606	.466	.216	-.070	-.159	-.163	-.187	-.173	-.214
Jan.	*	*	*	1.000	.542	.228	-.064	-.139	-.231	-.174	-.218	-.131
Feb.	*	*	*	*	1.000	.240	-.050	.020	.099	-.148	-.198	-.072
Mar.	*	*	*	*	*	1.000	.234	.149	-.058	-.023	.322	-.106
Apr.	*	*	*	*	*	*	1.000	.099	.047	-.076	.339	.081
May	*	*	*	*	*	*	*	1.000	.681	.389	.228	-.040
June	*	*	*	*	*	*	*	*	1.000	.321	.029	-.036
July	*	*	*	*	*	*	*	*	*	1.000	.330	.047
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.180
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E1.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06395000, Cheyenne River at Edgemont

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1947	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.93	30	2.17	24	4.17	24	5.42	23	4.54	18
1948	.0000	2	.0000	2	.0000	2	.0000	2	.087	13	2.27	26	4.48	27	6.38	28	5.17	20
1949	.0000	3	.0000	3	.0000	3	.0000	3	.0000	1	.007	3	.20	6	1.83	12	3.76	14
1950	.0000	4	.0000	4	.0000	4	.0000	4	.053	10	.30	14	.59	9	1.23	9	2.35	9
1951	.0000	5	.0000	5	.0000	5	.057	22	.10	14	.25	13	1.24	13	1.98	13	3.94	15
1952	.0000	6	.0000	6	.0000	6	.050	21	.11	16	.16	9	.18	5	.19	5	1.29	7
1953	.10	30	.10	30	.10	28	.10	26	.10	15	.11	8	.96	12	1.41	10	3.16	13
1954	.0000	7	.0000	7	.0000	7	.0000	5	.0000	2	.023	5	.039	4	.068	4	.080	3
1955	.10	31	.10	31	.13	30	.16	29	.68	29	.99	20	9.25	40	9.81	35	22.5	41
1956	.0000	8	.0000	8	.0000	8	.0000	6	.0000	3	.023	6	1.49	15	3.00	17	2.38	10
1957	.0000	9	.033	28	.10	29	.15	28	.46	26	2.11	23	3.05	21	6.56	29	7.70	27
1958	.0000	10	.0000	9	.0000	9	.014	17	.030	9	.088	7	.29	7	.94	8	.80	4
1959	.0000	11	.0000	10	.0000	10	.0000	7	.0000	4	.0000	1	.0000	1	.006	1	.070	2
1960	.0000	12	.0000	11	.0000	11	.0000	8	.0000	5	.0000	2	.0000	2	.006	2	.030	1
1961	.0000	13	.0000	12	.0000	12	.0000	9	.0000	6	.012	4	.017	3	.021	3	5.95	23
1962	.0000	14	.0000	13	.0000	13	.007	16	.21	20	4.94	33	6.48	32	10.3	38	17.0	39
1963	.0000	15	.0000	14	.0000	14	.0000	10	.0000	7	.21	12	.71	11	1.45	11	2.17	8
1964	.0000	16	.0000	15	.0000	15	.0000	11	.27	23	1.23	21	1.55	16	2.08	14	2.47	11
1965	1.00	37	1.00	37	1.00	36	1.18	36	1.57	31	3.37	29	5.01	28	6.30	25	14.6	37
1966	.0000	17	.0000	16	.0000	16	.72	31	1.71	33	5.16	37	14.7	43	24.0	43	27.9	43
1967	1.20	39	1.40	39	1.89	40	2.34	40	3.42	38	8.65	43	11.4	42	11.6	41	12.1	34
1968	1.50	40	1.50	40	1.71	39	1.75	39	1.80	34	2.03	22	2.54	19	3.42	19	6.23	24
1969	.0000	18	.0000	17	.0000	17	.92	32	2.58	36	4.47	30	5.58	29	6.35	27	6.85	26
1970	.0000	19	.0000	18	.0000	18	.0000	12	.073	12	2.81	27	4.47	26	6.34	26	5.56	22
1971	.10	32	.10	32	.13	31	.24	30	.66	28	2.24	25	6.81	33	10.7	39	10.2	31
1972	.50	34	.83	36	1.14	38	1.46	38	2.72	37	5.03	35	6.82	34	8.88	32	9.40	28
1973	.50	35	.63	34	.87	35	1.01	34	4.88	42	12.7	44	24.2	44	27.5	44	47.9	44
1974	.0000	20	.0000	19	.0000	19	.021	19	.11	18	.18	11	2.63	20	2.24	15	4.18	16
1975	.0000	21	.0000	20	.014	27	.025	20	.21	19	.78	19	2.46	18	4.40	20	5.32	21
1976	.0000	22	.0000	21	.007	26	.075	24	.26	22	.38	15	3.47	22	5.09	22	4.52	17
1977	.0000	23	.047	29	.17	33	1.01	35	2.35	35	5.05	36	6.11	31	6.19	24	10.9	32
1978	3.00	44	3.33	44	3.54	44	3.79	42	4.27	40	4.57	31	6.86	35	9.83	36	12.8	35
1979	2.10	42	2.20	43	2.84	43	3.95	43	6.08	44	7.55	40	9.76	41	10.8	40	21.1	40
1980	.0000	24	.0000	22	.0000	20	.089	25	.41	25	5.00	34	5.69	30	7.50	30	16.0	38
1981	.0000	25	.0000	23	.0000	21	.0000	13	.60	27	5.48	38	7.36	36	8.04	31	9.98	30
1982	7.20	46	7.23	46	7.46	46	9.06	46	13.5	45	30.6	46	34.6	46	39.9	46	57.5	45
1983	1.00	38	1.03	38	1.07	37	1.39	37	3.72	39	4.82	32	8.69	38	10.2	37	13.9	36
1984	2.10	43	2.10	42	2.16	41	2.40	41	4.84	41	7.58	41	9.24	39	12.2	42	11.8	33
1985	.0000	26	.0000	24	.0000	22	.016	18	.11	17	.17	10	.34	8	.71	6	1.03	5
1986	3.50	45	3.93	45	4.80	45	5.71	45	15.0	46	24.3	45	24.7	45	29.1	45	69.9	46
1987	.68	36	.70	35	.83	34	.94	33	1.66	32	3.22	28	3.69	23	4.78	21	5.10	19
1988	.0000	27	.0000	25	.0000	23	.0000	14	.0000	8	.60	17	.70	10	.78	7	1.28	6
1989	.0000	28	.0000	26	.0000	24	.0000	15	.054	11	6.04	39	4.43	25	9.22	34	26.0	42
1990	.0000	29	.0000	27	.0000	25	.064	23	.35	24	.47	16	1.88	17	3.29	18	6.56	25
1991	1.50	41	1.83	41	2.61	42	4.04	44	5.71	43	7.74	42	8.44	37	9.04	33	9.76	29
1992	.13	33	.13	33	.14	32	.15	27	.24	21	.77	18	1.44	14	2.39	16	2.75	12

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E1.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06395000, Cheyenne River at Edgemont

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1947	2,230	18	1,446	21	881	20	802	15	501	14	280	18	195	21	161	22	126	23
1948	2,200	20	1,489	19	1,080	17	888	12	539	13	403	12	291	13	222	16	201	10
1949	1,250	32	713	34	547	29	455	23	355	20	235	24	191	22	200	18	137	21
1950	1,300	30	634	36	347	37	223	38	150	36	117	33	111	30	105	28	73.6	30
1951	2,260	15	1,893	12	1,398	13	716	17	485	16	396	14	366	8	279	10	187	14
1952	6,740	4	3,690	7	1,824	7	1,037	11	546	12	542	6	370	6	287	8	200	11
1953	1,890	22	1,167	27	633	25	349	29	306	24	164	26	160	26	132	25	115	24
1954	1,010	36	762	33	501	33	269	34	146	38	79.8	39	69.8	39	52.6	40	38.4	42
1955	4,380	9	2,955	9	1,463	12	859	13	594	11	409	11	354	11	316	6	275	5
1956	1,860	23	1,192	25	583	28	276	32	250	30	130	31	96.5	32	110	27	79.7	28
1957	5,960	7	3,437	8	1,755	8	1,150	9	875	7	519	8	368	7	301	7	210	8
1958	4,070	10	2,883	10	1,549	11	1,259	8	922	6	524	7	356	9	275	11	199	12
1959	1,070	35	831	32	506	32	345	30	182	32	107	35	73.1	38	70.0	37	47.9	39
1960	843	38	497	39	346	38	195	39	107	42	54.1	45	53.2	42	48.7	42	32.7	43
1961	950	37	641	35	330	39	154	43	97.2	43	66.3	43	48.1	45	36.6	45	25.5	45
1962	13,200	2	10,910	2	7,066	2	4,573	1	3,900	1	2,410	1	1,706	1	1,283	1	861	1
1963	2,020	21	1,877	13	1,615	9	1,104	10	652	10	399	13	286	14	226	15	176	17
1964	2,220	19	1,733	16	1,225	14	854	14	501	15	280	17	196	20	164	21	109	26
1965	6,310	5	5,550	4	3,259	5	1,695	5	1,027	5	675	5	517	5	392	5	272	6
1966	1,330	29	1,247	23	627	27	410	26	260	28	242	21	167	25	126	26	114	25
1967	3,150	12	2,517	11	1,555	10	1261	7	788	8	467	9	355	10	286	9	214	7
1968	2,480	14	1,398	22	761	23	415	24	257	29	150	29	119	27	102	29	83.0	27
1969	5,340	8	3,800	6	2,701	6	1,450	6	785	9	465	10	342	12	269	12	202	9
1970	345	44	261	45	178	45	125	45	116	40	91.9	37	82.0	35	77.6	36	55.6	36
1971	9,850	3	7,163	3	3,948	3	3,293	3	1,863	4	1,123	3	810	3	624	3	416	3
1972	614	42	406	41	366	36	255	36	168	33	101	36	77.5	36	88.2	32	70.0	33
1973	3,270	11	1,647	17	966	19	612	20	353	21	219	25	180	24	146	23	143	20
1974	311	45	262	44	238	43	176	40	122	39	90.4	38	73.3	37	61.9	38	49.3	38
1975	642	41	398	42	383	35	275	33	165	34	119	32	107	31	98.4	30	71.4	31
1976	1,620	27	1,228	24	663	24	363	28	263	27	152	28	119	28	92.3	31	70.0	34
1977	1,130	34	609	37	286	41	137	44	96.6	45	69.9	42	53.2	43	52.5	41	44.5	40
1978	24,000	1	14,430	1	7,557	1	4,098	2	2,330	2	1,259	2	1,044	2	833	2	607	2
1979	2,240	16	1,575	18	812	22	495	22	322	23	236	23	183	23	144	24	158	18
1980	1,760	25	929	30	461	34	267	35	217	31	135	30	95.7	33	87.6	34	78.0	29
1981	1,250	33	872	31	524	30	384	27	284	25	159	27	114	29	87.8	33	62.5	35
1982	1,810	24	1,473	20	842	21	509	21	344	22	243	20	199	19	171	20	147	19
1983	837	39	498	38	326	40	231	37	149	37	108	34	88.7	34	77.8	35	70.3	32
1984	1,340	28	1,187	26	1,011	18	716	16	458	17	329	15	275	15	247	13	191	13
1985	438	43	367	43	273	42	175	41	112	41	70.1	41	50.7	44	39.6	44	31.3	44
1986	2,620	13	1,843	15	1,178	15	660	19	436	18	293	16	249	16	232	14	178	16
1987	2,240	17	1,873	14	1,126	16	667	18	402	19	248	19	201	18	180	19	130	22
1988	192	46	134	46	94.3	46	64.1	46	48.9	46	31.9	46	24.4	46	22.0	46	18.9	46
1989	1,300	31	980	29	519	31	285	31	155	35	77.5	40	55.7	41	42.6	43	42.2	41
1990	665	40	450	40	230	44	158	42	97.1	44	64.3	44	62.5	40	54.4	39	53.5	37
1991	6,110	6	5,333	5	3,797	4	2,632	4	1,896	3	1,046	4	711	4	540	4	360	4
1992	124	47	92.0	47	55.7	47	50.5	47	39.6	47	27.5	47	21.6	47	18.4	47	18.1	47
1993	1,680	26	1,019	28	628	26	413	25	275	26	241	22	205	17	202	17	183	15

Table E2.1. Mean flow, in cubic feet per second, for station 06400000, Hat Creek near Edgemont

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1905	(1)	(1)	(1)	(1)	(1)	(1)	(1)	134	448	519	698	6.3	(2)
1906	3.6	2.0	1.6	1.6	1.8	57	75	137	114	12	164	126	58.2
1951	1.00	0.000	0.010	0.70	1.12	5.29	0.68	2.81	108	174	34.2	35.5	30.5
1952	3.45	3.40	2.30	.53	6.55	71.5	10.8	56.5	99.0	15.1	9.91	.14	23.3
1953	.077	.14	.12	2.35	5.21	94.8	9.82	18.1	14.6	.000	.40	.023	12.3
1954	.000	.000	.000	.000	.000	8.07	2.93	135	7.48	1.09	2.14	.000	13.3
1955	.000	.030	.20	.061	.000	80.3	98.1	29.9	17.8	.003	68.4	70.1	30.5
1956	2.41	.70	16.0	3.67	3.27	10.6	.80	20.4	19.5	10.0	6.43	.000	7.86
1957	.000	1.86	2.40	.47	5.89	9.47	55.3	444	106	21.8	1.42	1.58	54.7
1958	2.95	2.16	1.84	2.21	3.75	13.6	29.2	.88	17.0	106	3.97	.000	15.4
1959	.000	.000	.013	1.53	.54	37.6	.46	11.1	21.9	40.2	.19	3.77	9.89
1960	.48	.32	.63	.32	.79	21.5	2.76	5.33	.72	.000	.000	.000	2.77
1961	.000	.000	.000	.000	.014	6.05	.36	.48	.20	6.33	2.02	.000	1.31
1962	.000	.000	.000	.000	.011	10.7	.37	73.7	134	40.7	2.51	.000	21.9
1963	.23	.023	.006	.013	23.1	34.0	3.72	3.13	72.6	3.90	.14	1.83	11.7
1964	.93	.077	.035	.14	.079	.73	11.9	3.49	52.5	.47	.000	.000	5.78
1965	.000	.000	.000	.000	.046	.21	.82	92.0	58.6	63.4	1.32	2.63	18.4
1966	6.59	1.65	.76	1.42	1.49	95.7	15.6	1.20	.15	12.9	44.9	.22	15.4
1967	6.34	1.03	.31	.24	1.60	.45	27.2	29.2	1,223	70.6	3.94	1.13	112
1968	1.76	6.73	3.51	4.50	11.4	5.12	141	50.0	272	90.6	31.5	1.81	51.3
1969	3.69	2.43	2.66	2.24	2.81	32.6	8.32	1.84	1.59	45.4	.91	.000	8.82
1970	.56	1.86	1.24	.19	1.29	1.21	14.9	.45	14.4	.000	.35	.000	3.00
1971	.000	.006	.000	.000	2.76	3.67	7.07	224	132	4.22	.005	.98	31.4
1972	1.31	2.67	.91	.67	6.54	11.5	1.53	2.70	6.99	3.49	.000	.000	3.18
1973	.000	.000	.000	.44	.45	24.6	57.2	64.4	.32	8.15	.030	7.83	13.7
1974	.28	.91	.98	25.5	24.2	7.80	86.9	1.07	.083	.000	.000	.000	12.1
1975	.000	.000	.000	.000	.000	.13	6.43	2.40	2.24	4.02	.000	.000	1.27
1976	.000	.000	.000	.000	3.59	.53	.34	25.0	42.0	1.02	.25	.000	6.02
1977	.000	.000	.000	.000	.000	.26	3.86	.42	2.83	.028	.000	.000	.61
1978	.094	.000	.016	.000	.014	119	2.03	69.6	1.91	1.39	.65	.000	16.6
1979	.000	.000	.000	.000	.000	9.65	2.86	1.07	.82	.60	17.9	.000	2.78
1980	.000	.000	.000	.074	52.6	15.2	10.0	.51	.062	.000	.22	.000	6.35
1981	.000	.000	.26	.38	.11	.097	.040	1.53	.93	.18	.000	.000	.30
1982	.000	.000	.000	.000	.010	.14	.075	82.2	172	4.82	37.5	2.61	25.0
1983	4.41	3.42	3.89	6.14	3.46	3.21	13.4	45.7	7.40	5.79	12.4	.40	9.22
1984	.14	1.26	1.04	5.06	10.1	2.30	20.3	116	103	9.98	1.96	.000	22.6
1985	.71	2.35	1.47	1.50	1.28	5.78	1.71	.60	1.87	.42	.000	.000	1.47
1986	.72	.000	.20	.39	15.5	103	90.9	33.2	206	29.0	2.56	.65	40.1
1987	13.0	6.50	5.12	5.89	10.4	67.0	15.2	15.4	13.5	.81	.004	.000	12.8
1988	.11	1.66	1.09	.80	2.08	4.94	.31	6.38	1.64	.011	.64	.000	1.64
1989	.000	.000	.000	.000	.000	.15	.36	.20	.23	.000	.000	1.01	.16
1990	.000	.000	.001	.015	.068	.35	.13	.74	.45	1.61	.014	.000	.29
1991	.000	.000	.000	.000	.11	.26	6.27	358	141	3.79	2.73	.000	43.1
1992	.046	.68	.60	.53	.87	.58	.48	.54	1.01	2.37	.20	.000	.66
1993	.000	.33	.25	.16	.19	150	107	12.2	64.7	71.3	2.90	.70	34.3

[1]Indicates a no-value month.

[2]Incomplete water year.

Table E2.2. Statistics on mean flow, in cubic feet per second, for station 06400000, Hat Creek near Edgemont (October 1950 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	43	43	43	43	43	43	43	43	43	43	43	43	43
Maximum	13.0	6.73	16.0	25.5	52.6	150	141	444	1,223	174	68.4	70.1	112
Percentile													
75th	1.00	1.66	1.09	1.50	5.21	32.6	15.6	56.5	99.0	21.8	3.94	1.01	23.3
50th	.077	.030	.20	.32	1.28	7.80	6.27	11.1	14.4	3.90	.65	.000	12.1
25th	.000	.000	.000	.000	.046	.58	.68	1.07	1.01	.42	.005	.000	2.78
Minimum	.000	.000	.000	.000	.000	.097	.040	.20	.062	.000	.000	.000	.16
Mean	1.19	0.98	1.11	1.58	4.73	24.88	20.22	47.52	73.12	19.90	6.85	3.09	17.11
Standard deviation	2.48	1.62	2.62	4.08	9.43	38.05	34.20	91.59	190.87	35.95	14.59	11.82	20.56
Skewness	3.20	2.24	4.71	5.09	3.67	1.83	2.17	3.14	5.47	2.61	2.78	5.05	2.68
Coefficient of variation	2.08	1.65	2.35	2.57	1.99	1.53	1.69	1.93	2.61	1.81	2.13	3.82	1.20
Percent of annual flow	0.58	0.48	0.54	0.77	2.30	12.12	9.86	23.16	35.64	9.70	3.34	1.51	[1]0.104

[1]Serial correlation for annual mean flows.

Table E2.3. Serial correlation for 1-year lag for monthly mean flow for station 06400000, Hat Creek near Edgemont (October 1950 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.062	0.106	0.065	-0.044	-0.146	-0.033	-0.006	-0.191	0.100	0.248	0.004	-0.056

Table E2.4. Correlation matrix for monthly mean flow for station 06400000, Hat Creek near Edgemont (October 1950 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.678	0.387	0.183	0.038	0.208	0.005	-0.150	0.276	0.124	0.119	-0.088
Nov.	*	1.000	0.404	0.282	0.116	0.040	0.302	-0.026	0.071	0.154	0.104	-0.137
Dec.	*	*	1.000	0.226	0.028	-0.033	0.032	-0.015	-0.049	0.007	0.015	-0.093
Jan.	*	*	*	1.000	0.340	-0.051	0.343	-0.101	-0.072	-0.035	-0.041	-0.079
Feb.	*	*	*	*	1.000	0.042	0.206	-0.081	-0.020	-0.081	-0.119	-0.105
Mar.	*	*	*	*	*	1.000	0.379	-0.121	-0.087	0.035	0.206	0.166
Apr.	*	*	*	*	*	*	1.000	0.082	0.178	0.267	0.343	0.306
May	*	*	*	*	*	*	*	1.000	0.118	-0.047	-0.056	-0.044
June	*	*	*	*	*	*	*	*	1.000	0.337	0.055	-0.015
July	*	*	*	*	*	*	*	*	*	1.000	0.240	0.241
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.730
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E2.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06400000, Hat Creek near Edgemont

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1951	0.20	42	0.27	42	0.30	42	0.30	42	0.32	39	0.75	36	10.75	36	2.00	37	4.31	40
1952	.0000	1	.0000	1	.0000	1	.0000	1	.050	35	.083	29	.11	27	.11	23	1.25	30
1953	.0000	2	.0000	2	.0000	2	.0000	2	.0000	1	.0000	1	.0000	1	.0000	1	.004	12
1954	.0000	3	.0000	3	.0000	3	.0000	3	.0000	2	.0000	2	.0000	2	.022	19	.050	16
1955	.0000	4	.0000	4	.0000	4	.0000	4	.0000	3	.64	35	3.75	41	5.48	41	6.16	42
1956	.0000	5	.0000	5	.0000	5	.0000	5	.0000	4	.0000	3	.011	22	.73	30	.80	26
1957	.0000	6	.0000	6	.0000	6	.0000	6	.043	34	.90	37	1.78	37	1.88	36	1.91	34
1958	.0000	7	.0000	7	.0000	7	.0000	7	.0000	5	.0000	4	.0000	3	.0000	2	.32	22
1959	.0000	8	.033	40	.071	40	.10	39	.12	36	.24	32	.41	30	.42	27	.94	27
1960	.0000	9	.0000	8	.0000	8	.0000	8	.0000	6	.0000	5	.0000	4	.0000	3	.0000	1
1961	.0000	10	.0000	9	.0000	9	.0000	9	.0000	7	.0000	6	.0000	5	.0000	4	.0000	2
1962	.0000	11	.0000	10	.0000	10	.0000	10	.0000	8	.008	26	.014	24	.067	20	.21	20
1963	.0000	12	.0000	11	.0000	11	.0000	11	.0000	9	.035	28	.072	25	.076	21	.29	21
1964	.0000	13	.0000	12	.0000	12	.0000	12	.0000	10	.0000	7	.0000	6	.0000	5	.0000	3
1965	.0000	14	.0000	13	.0000	13	.0000	13	.31	38	1.04	38	1.06	35	1.27	35	2.30	35
1966	.0000	15	.0000	14	.0000	14	.0000	14	.12	37	.27	33	.48	32	.63	28	1.61	32
1967	.0000	16	.0000	15	.0000	15	.13	40	.91	42	1.34	39	2.11	38	3.24	39	3.56	38
1968	.0000	17	.0000	16	.030	39	.090	38	.65	41	2.27	41	2.35	39	2.40	38	2.54	36
1969	.0000	18	.0000	17	.0000	16	.0000	15	.0000	11	.024	27	.29	28	.77	31	.68	25
1970	.0000	19	.0000	18	.0000	17	.0000	16	.0000	12	.0000	8	.0000	7	.0010	16	.0010	11
1971	.0000	20	.0000	19	.0000	18	.0000	17	.0000	13	.19	31	.44	31	1.01	33	1.07	29
1972	.0000	21	.0000	20	.0000	19	.0000	18	.0000	14	.0000	9	.0000	8	.0000	6	.027	14
1973	.0000	22	.0000	21	.0000	20	.0000	19	.0000	15	.30	34	.71	34	1.10	34	2.90	37
1974	.0000	23	.0000	22	.0000	21	.0000	20	.0000	16	.0000	10	.0000	9	.0000	7	.0000	4
1975	.0000	24	.0000	23	.0000	22	.0000	21	.0000	17	.0000	11	.0000	10	.0000	8	.0000	5
1976	.0000	25	.0000	24	.0000	23	.0000	22	.0000	18	.0000	12	.0000	11	.0000	9	.0000	6
1977	.0000	26	.0000	25	.0000	24	.0000	23	.0000	19	.0000	13	.002	19	.004	17	.019	13
1978	.0000	27	.0000	26	.0000	25	.0000	24	.0000	20	.0000	14	.0000	12	.0000	10	.0000	7
1979	.0000	28	.0000	27	.0000	26	.0000	25	.0000	21	.0000	15	.0000	13	.0000	11	1.29	31
1980	.0000	29	.0000	28	.0000	27	.0000	26	.0000	22	.0000	16	.0000	14	.0000	12	.044	15
1981	.0000	30	.0000	29	.0000	28	.0000	27	.0000	23	.0000	17	.0000	15	.0000	13	.0000	8
1982	.0000	31	.0000	30	.0000	29	.0000	28	.008	33	2.87	42	3.47	40	3.58	40	3.76	39
1983	.0000	32	.0000	31	.0000	30	.0000	29	.0000	24	.12	30	.51	33	.64	29	1.86	33
1984	.0000	33	.0000	32	.0000	31	.0000	30	.0000	25	.0000	18	.37	29	.89	32	1.04	28
1985	.0000	34	.0000	33	.0000	32	.0000	31	.0000	26	.0000	19	.002	20	.17	24	.19	19
1986	.070	41	.090	41	.12	41	.21	41	.35	40	1.38	40	4.94	42	5.65	42	5.62	41
1987	.0000	35	.0000	34	.0000	33	.0000	32	.0000	27	.0000	20	.002	21	.21	25	.55	24
1988	.0000	36	.0000	35	.0000	34	.0000	33	.0000	28	.0000	21	.0000	16	.0000	14	.0000	9
1989	.0000	37	.0000	36	.0000	35	.0000	34	.0000	29	.0000	22	.0000	17	.004	18	.071	17
1990	.0000	38	.0000	37	.0000	36	.0000	35	.0000	30	.0000	23	.0000	18	.0000	15	.0000	10
1991	.0000	39	.0000	38	.0000	37	.0000	36	.0000	31	.0000	24	.10	26	.30	26	.42	23
1992	.0000	40	.0000	39	.0000	38	.0000	37	.0000	32	.0000	25	.011	23	.10	22	.13	18

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E2.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days for station 06400000, Hat Creek near Edgemont

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1951	1,350	8	785	8	415	9	286	8	190	9	155	6	118	6	90.3	8	60.2	8
1952	758	14	550	14	265	19	197	15	118	15	82.6	14	64.7	15	60.9	12	44.1	11
1953	547	22	466	19	309	16	183	19	99.1	20	60.0	19	42.2	20	35.4	20	24.3	20
1954	2,890	3	1,311	5	589	7	284	9	146	11	73.9	16	52.2	16	39.7	16	26.4	19
1955	1,330	9	677	9	302	17	146	21	105	18	90.7	13	70.8	13	57.4	13	49.3	10
1956	241	29	127	31	84.9	30	41.9	31	37.1	30	23.8	30	18.3	29	14.4	30	12.2	28
1957	4,440	2	2,340	2	1,505	2	868	2	508	2	284	2	206	2	161	2	108	2
1958	682	17	470	17	274	18	215	14	111	17	63.8	18	45.6	18	39.5	17	29.1	16
1959	283	28	187	27	124	27	69.6	29	57.6	26	32.5	26	25.0	25	24.8	24	18.9	24
1960	111	34	83.3	33	58.7	33	42.3	30	22.4	31	14.9	31	10.2	31	7.85	32	5.31	34
1961	80.0	36	43.3	36	21.6	36	11.6	37	8.05	35	4.31	36	3.01	38	2.39	38	2.61	36
1962	917	11	546	15	336	14	240	12	173	10	123	10	85.0	10	64.4	10	43.7	13
1963	567	21	385	22	230	21	126	22	72.6	22	38.3	23	35.3	22	28.9	22	23.0	22
1964	401	23	251	23	178	23	102	24	52.9	27	28.1	28	22.6	28	17.3	27	11.4	30
1965	597	19	418	21	211	22	187	17	131	12	79.9	15	73.3	12	55.1	14	36.7	14
1966	700	16	554	13	345	13	185	18	100	19	57.3	20	38.8	21	30.9	21	28.9	17
1967	8,350	1	5,463	1	3,795	1	2,117	1	1,229	1	649	1	442	1	339	1	223	1
1968	1,610	6	1,443	4	940	4	480	5	295	5	191	4	156	4	140	3	97.7	3
1969	309	27	220	25	155	24	90.1	25	47.5	28	24.6	29	16.8	30	14.6	29	15.6	25
1970	202	30	109	32	60.0	32	29.1	33	14.9	34	14.2	32	10.0	32	7.86	31	5.34	33
1971	1,530	7	1,277	6	827	5	630	4	352	4	184	5	125	5	94.6	6	62.6	7
1972	118	33	61.0	34	29.9	34	19.6	34	15.0	33	9.14	34	6.97	33	6.67	33	5.45	32
1973	579	20	442	20	234	20	196	16	118	16	73.4	17	49.7	17	37.4	18	26.7	18
1974	711	15	558	12	329	15	165	20	87.3	21	48.0	21	45.1	19	36.2	19	24.0	21
1975	104	35	40.4	37	19.9	37	12.6	36	7.97	36	4.47	35	3.78	36	3.86	35	2.53	37
1976	350	26	208	26	107	28	71.7	28	65.0	24	34.3	25	23.0	27	17.3	28	12.0	29
1977	46.0	38	31.7	38	15.4	39	7.50	39	3.90	39	2.18	39	2.38	39	1.86	39	1.22	39
1978	800	13	600	11	418	8	243	11	124	14	92.7	12	66.2	14	49.8	15	33.0	15
1979	394	24	174	28	76.3	31	35.9	32	18.5	32	9.75	33	6.80	34	5.26	34	5.55	31
1980	200	31	170	29	143	25	107	23	63.8	25	37.3	24	25.6	24	19.3	26	12.7	27
1981	13.0	41	8.87	40	3.91	43	2.79	42	2.41	41	1.35	41	.91	42	.70	42	.56	42
1982	840	12	615	10	362	10	290	7	209	7	131	9	87.5	9	75.6	9	49.8	9
1983	372	25	233	24	133	26	76.4	27	47.4	29	30.5	27	23.1	26	20.6	25	14.9	26
1984	625	18	541	16	348	11	223	13	129	13	116	11	82.3	11	63.5	11	43.8	12
1985	20.0	39	17.7	39	16.3	38	11.2	38	6.57	38	4.02	38	3.05	37	2.70	37	2.46	38
1986	1,640	5	1,236	7	761	6	396	6	213	6	145	7	112	7	112	5	79.5	5
1987	192	32	130	30	103	29	87.1	26	72.4	23	42.8	22	33.9	23	28.5	23	21.4	23
1988	71.0	37	54.3	35	27.2	35	12.8	35	7.66	37	4.12	37	4.16	35	3.56	36	2.71	35
1989	7.50	43	5.23	43	4.16	42	2.03	43	1.01	43	.51	43	.34	43	.31	43	.31	43
1990	11.0	42	6.70	42	5.14	41	3.31	41	1.68	42	1.06	42	.96	41	.75	41	.57	41
1991	2,890	4	1,862	3	966	3	649	3	478	3	256	3	174	3	131	4	86.0	4
1992	15.0	40	8.67	41	5.23	40	4.05	40	2.90	40	1.79	40	1.37	40	1.12	40	.98	40
1993	1,090	10	467	18	348	12	255	10	201	8	132	8	93.1	8	91.0	7	68.1	6

Table E3.1. Mean flow, in cubic feet per second, for station 06400497, Cascade Springs near Hot Springs

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1976	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21.5	19.6	20.0	(2)
1977	20.0	19.8	19.1	18.5	19.0	19.6	20.0	20.0	20.0	20.0	19.1	18.8	19.5
1978	20.1	22.5	23.8	24.8	22.2	20.9	19.4	20.1	22.4	20.8	19.0	18.5	21.2
1979	18.1	19.0	19.0	18.8	18.9	17.7	17.6	19.9	20.7	23.1	21.3	20.0	19.5
1980	20.4	21.0	21.0	20.5	20.0	19.5	19.5	20.6	21.9	21.6	19.6	18.9	20.4
1981	19.0	19.0	19.0	18.8	18.5	18.4	18.0	18.1	18.0	18.5	19.0	19.3	18.6
1982	19.9	19.1	18.0	18.0	18.4	18.1	19.4	20.9	21.0	23.2	22.6	20.7	19.9
1983	21.0	21.0	21.0	21.0	21.0	21.3	22.0	21.4	20.5	20.8	21.6	20.9	21.1
1984	19.7	20.0	19.9	20.1	21.7	23.0	23.0	23.7	23.1	21.6	20.6	20.0	21.4
1985	19.2	19.5	20.8	21.5	19.6	19.4	19.7	21.3	22.0	21.6	21.0	21.5	20.6
1986	21.0	20.0	19.1	20.0	20.1	20.2	20.8	21.6	22.2	21.7	21.8	22.0	20.9
1987	22.0	21.2	21.0	20.5	20.6	20.1	21.3	21.8	22.3	22.3	21.3	21.0	21.3
1988	20.5	20.0	20.0	20.0	19.8	19.9	19.8	20.0	20.0	19.3	18.0	18.0	19.6
1989	18.0	19.0	18.6	18.0	18.0	18.0	18.7	18.0	18.0	18.1	18.6	18.5	18.3
1990	18.0	18.3	18.4	18.0	18.2	18.9	18.9	19.8	19.5	19.0	19.0	19.7	18.8
1991	19.5	19.4	19.0	18.1	18.9	19.1	18.0	18.0	18.0	17.7	17.1	17.7	18.4
1992	17.6	17.9	17.6	18.2	17.9	18.0	18.4	18.0	17.3	17.3	18.3	17.4	17.8
1993	18.4	16.3	15.8	15.6	16.5	15.6	16.6	17.1	16.2	14.6	16.2	16.6	16.3

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E3.2. Statistics on mean flow, in cubic feet per second, for station 06400497, Cascade Springs near Hot Springs (October 1976 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	17	17	17	17	17	17	17	17	17	17	17	17	17
Maximum	22.0	22.5	23.8	24.8	22.2	23.0	23.0	23.7	23.1	23.2	22.6	22.0	21.4
Percentile													
75th	20.5	20.5	20.9	20.5	20.3	20.1	20.4	21.3	22.1	21.6	21.3	20.8	21.0
50th	19.7	19.5	19.1	18.8	19.0	19.4	19.4	20.0	20.5	20.8	19.1	19.3	19.6
25th	18.2	19.0	18.5	18.0	18.3	18.0	18.2	18.0	18.0	18.3	18.4	18.2	18.5
Minimum	17.6	16.3	15.8	15.6	16.5	15.6	16.6	17.1	16.2	14.6	16.2	16.6	16.3
Mean	19.55	19.59	19.48	19.44	19.37	19.28	19.48	20.02	20.18	20.07	19.65	19.38	19.62
Standard deviation	1.25	1.42	1.77	2.01	1.47	1.66	1.63	1.74	2.07	2.32	1.78	1.53	1.44
Skewness	0.10	-0.21	0.41	0.86	0.20	0.09	0.48	0.12	-0.43	-0.72	-0.15	-0.01	-0.65
Coefficient of variation	0.06	0.07	0.09	0.10	0.08	0.09	0.08	0.09	0.10	0.12	0.09	0.08	0.07
Percent of annual flow	8.30	8.32	8.27	8.25	8.23	8.19	8.27	8.50	8.57	8.52	8.35	8.23	[1]0.633

[1]Serial correlation for annual mean flows.

Table E3.3. Serial correlation for 1-year lag for monthly mean flow for station 06400497, Cascade Springs near Hot Springs (October 1976 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.289	0.207	0.070	0.054	0.280	0.281	0.496	0.546	0.528	0.549	0.499	0.625

Table E3.4. Correlation matrix for monthly mean flow for station 06400497, Cascade Springs near Hot Springs (October 1976 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.739	0.577	0.526	0.679	0.610	0.678	0.624	0.637	0.510	0.443	0.474
Nov.	*	1.000	.944	.886	.907	.767	.629	.596	.759	.627	.428	.401
Dec.	*	*	1.000	.965	.889	.717	.518	.526	.721	.544	.328	.342
Jan.	*	*	*	1.000	.888	.707	.520	.549	.739	.540	.372	.383
Feb.	*	*	*	*	1.000	.916	.777	.763	.832	.613	.455	.448
Mar.	*	*	*	*	*	1.000	.898	.799	.746	.513	.414	.452
Apr.	*	*	*	*	*	*	1.000	.888	.738	.566	.593	.606
May	*	*	*	*	*	*	*	1.000	.921	.807	.767	.758
June	*	*	*	*	*	*	*	*	1.000	.880	.732	.716
July	*	*	*	*	*	*	*	*	*	1.000	.900	.795
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.920
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E3.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06400497, Cascade Springs near Hot Springs

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1977	18.0	8	18.0	8	18.0	7	18.1	10	18.4	9	18.7	9	19.0	9	19.2	9	19.5	9
1978	17.0	4	17.0	3	17.1	5	17.5	4	17.7	4	18.3	6	18.5	6	18.6	6	18.6	6
1979	17.0	5	17.0	4	17.0	3	17.1	3	17.6	3	18.8	10	19.4	10	20.2	14	20.4	14
1980	16.0	2	17.3	6	17.7	6	17.9	6	18.4	10	18.5	8	18.6	7	18.7	7	18.8	7
1981	18.0	9	18.0	9	18.0	8	18.0	7	18.0	6	18.0	4	18.0	3	18.1	3	18.5	5
1982	18.0	10	18.3	12	18.7	12	18.9	12	19.4	13	20.1	16	20.4	16	20.9	16	20.9	15
1983	19.0	13	19.0	13	19.0	13	19.4	15	19.7	15	19.9	13	19.9	13	19.9	12	20.3	13
1984	19.0	14	19.0	14	19.0	14	19.0	13	19.1	11	19.3	11	19.6	11	19.7	10	20.0	10
1985	19.0	15	19.0	15	19.0	15	19.0	14	19.1	12	19.5	12	19.7	12	19.8	11	20.1	12
1986	18.0	11	18.0	10	18.4	11	18.8	11	19.6	14	20.0	15	20.3	15	20.5	15	20.9	16
1987	19.0	16	19.3	16	19.6	16	19.7	16	19.8	16	19.9	14	19.9	14	19.9	13	20.0	11
1988	18.0	12	18.0	11	18.0	9	18.0	8	18.0	7	18.0	5	18.0	4	18.1	4	18.3	4
1989	17.0	6	17.0	5	17.0	4	17.5	5	17.8	5	17.9	3	18.0	5	18.1	5	18.2	3
1990	17.0	7	17.7	7	18.0	10	18.0	9	18.1	8	18.4	7	18.6	8	18.8	8	19.0	8
1991	16.0	3	16.0	2	16.0	2	16.7	2	17.1	2	17.2	2	17.4	2	17.5	2	17.6	2
1992	14.0	1	14.0	1	14.4	1	15.0	1	15.4	1	15.6	1	15.8	1	15.9	1	16.4	1

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E3.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days for station 06400497, Cascade Springs near Hot Springs

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1977	21.0	10	20.3	11	20.1	11	20.1	11	20.0	11	20.0	11	20.0	11	20.0	11	19.8	11
1978	25.0	1	25.0	1	25.0	1	25.0	1	24.9	1	24.3	1	23.8	1	23.4	1	22.5	2
1979	24.0	3	24.0	3	24.0	3	23.7	4	23.1	4	22.3	4	21.7	6	21.3	8	20.5	8
1980	22.0	8	22.0	8	22.0	8	22.0	8	22.0	8	21.8	8	21.4	9	21.0	9	20.5	9
1981	20.0	12	20.0	12	20.0	12	19.5	14	19.3	14	19.1	14	19.0	14	18.9	14	18.8	14
1982	25.0	2	25.0	2	25.0	2	24.6	2	24.0	2	23.1	3	22.3	3	22.0	3	21.3	5
1983	22.0	9	22.0	9	22.0	9	22.0	9	22.0	9	21.8	9	21.6	7	21.4	7	21.3	6
1984	24.0	4	24.0	4	24.0	4	24.0	3	23.9	3	23.4	2	23.3	2	23.2	2	22.7	1
1985	23.0	5	23.0	5	22.6	7	22.3	7	22.2	7	22.0	7	21.6	8	21.6	6	21.2	7
1986	23.0	6	23.0	6	23.0	5	22.9	5	22.5	6	22.1	6	21.9	5	21.9	5	21.7	3
1987	23.0	7	23.0	7	23.0	6	22.9	6	22.6	5	22.3	5	22.2	4	22.0	4	21.7	4
1988	21.0	11	21.0	10	21.0	10	20.9	10	20.5	10	20.2	10	20.2	10	20.1	10	20.0	10
1989	19.0	16	19.0	16	19.0	15	19.0	15	19.0	15	18.8	15	18.5	15	18.4	15	18.4	15
1990	20.0	13	20.0	13	20.0	13	20.0	12	20.0	12	19.6	12	19.4	12	19.3	12	19.3	12
1991	20.0	14	20.0	14	20.0	14	19.9	13	19.6	13	19.5	13	19.3	13	19.0	13	19.0	13
1992	19.0	17	19.0	17	19.0	16	18.7	17	18.4	16	18.2	16	18.1	16	18.1	16	18.1	16
1993	20.0	15	19.3	15	19.0	17	18.9	16	18.4	17	17.4	17	16.9	17	16.5	17	16.4	17

Table E.4.1. Mean flow, in cubic feet per second, for station 06400500, Cheyenne River near Hot Springs

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1915	148	44.9	34.7	25.8	25.7	378	1,203	2,535	3,589	2,462	3,362	2,812	1,390
1916	423	172	99.4	68.5	873	253	229	340	735	468	247	36.5	326
1917	46.7	41.5	27.4	23.0	109	610	681	1,958	867	43.1	104	23.0	380
1918	26.6	30.1	28.0	35.6	110	231	189	543	789	1,827	1,153	73.1	424
1919	122	38.7	27.2	30.4	36.9	295	443	39.5	252	911	375	137	227
1920	246	64.8	(1)	(1)	41.0	1,510	1,181	8,890	2,230	1,583	969	367	(2)
1943	(1)	(1)	(1)	(1)	(1)	533	165	159	732	44.7	28.8	18.2	(2)
1944	21.6	31.6	27.0	26.7	27.8	131	220	222	350	603	18.0	19.1	142
1945	19.7	26.4	33.2	21.4	25.9	231	85.0	51.0	496	423	250	48.5	143
1946	24.5	24.8	19.3	23.5	77.9	62.0	34.2	214	834	293	27.5	289	160
1947	132	50.6	26.2	22.9	172	138	93.2	35.8	770	401	64.7	21.4	160
1948	23.7	33.1	36.8	24.2	71.8	510	59.3	68.0	423	304	162	15.0	145
1949	21.9	36.5	25.5	23.7	212	857	133	206	251	31.8	29.6	19.9	154
1950	22.2	26.8	21.8	27.6	42.3	67.7	157	171	129	184	33.6	22.5	75.6
1951	29.2	24.1	23.4	23.6	30.1	62.8	36.9	16.3	414	632	379	406	174
1952	33.1	37.7	28.4	23.1	45.1	118	85.7	471	640	239	98.1	14.3	153
1953	18.3	19.4	18.3	25.9	47.6	280	52.2	108	273	18.0	175	24.8	88.5
1954	24.0	21.6	22.7	19.5	42.9	51.1	30.6	234	39.3	53.0	168	13.6	60.5
1955	20.4	20.4	21.4	20.5	23.2	259	889	316	360	45.9	486	182	220
1956	32.3	24.4	61.5	38.0	67.1	145	34.0	144	223	21.8	45.4	16.3	71.0
1957	15.1	20.3	23.0	19.1	39.3	76.8	97.1	1,151	618	106	112	37.2	194
1958	26.9	42.9	25.5	23.0	33.0	76.4	155	16.8	125	933	214	14.4	142
1959	15.7	20.6	18.8	17.9	19.7	100	26.8	23.6	193	109	11.8	15.2	47.8
1960	15.9	18.0	19.9	19.8	24.3	121	25.9	26.5	87.0	13.3	10.7	14.0	33.1
1961	21.4	19.4	23.0	21.3	22.7	30.7	23.1	16.9	34.2	92.1	48.7	15.7	30.9
1962	22.4	24.7	19.4	19.5	90.2	121	21.1	1,895	2,266	790	130	23.7	453
1963	50.6	33.3	29.5	23.4	159	112	75.5	156	685	83.5	16.9	95.7	125
1964	18.9	17.7	19.4	20.5	27.3	51.8	89.5	88.5	494	71.0	17.1	18.2	77.3
1965	19.6	20.1	21.3	28.2	38.6	80.7	88.9	451	1,033	338	64.7	38.0	185
1966	69.2	32.2	28.5	27.5	25.1	275	80.2	28.4	14.0	251	312	38.9	99.7
1967	69.3	46.8	37.8	39.4	93.4	502	108	185	1,921	330	39.3	40.2	283
1968	25.1	37.6	33.0	29.3	64.7	137	83.1	58.3	470	120	103	49.3	100
1969	29.2	35.3	31.0	27.5	28.7	189	92.5	123	117	909	48.4	15.5	139
1970	20.8	31.1	39.5	20.9	82.1	121	113	107	78.1	26.9	34.5	12.5	57.0
1971	31.4	31.3	31.2	22.5	80.1	158	395	1,283	967	59.6	10.5	25.4	258
1972	43.5	49.0	32.7	26.8	121	406	61.3	50.3	129	36.4	38.9	24.1	84.9

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E4.2. Statistics on mean flow, in cubic feet per second, for station 06400500, Cheyenne River near Hot Springs (October 1943 to September 1972)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	29	29	29	29	29	29	29	29	29	29	29	29	29
Maximum	132	50.6	61.5	39.4	212	857	889	1,895	2,266	933	486	406	453
Percentile													
75th	31.9	35.9	31.9	27.1	81.1	245	110	228	662	369	165	39.5	167
50th	23.7	26.8	25.5	23.4	42.9	121	85.0	123	360	120	48.7	22.5	142
25th	20.0	20.5	21.3	20.7	27.5	76.6	35.5	43.1	127	49.4	28.5	15.4	76.4
Minimum	15.1	17.7	18.3	17.9	19.7	30.7	21.1	16.3	14.0	13.3	10.5	12.5	30.9
Mean	31.65	29.58	27.55	24.39	63.27	188.66	118.83	273.01	497.71	259.25	108.60	54.15	139.87
Standard deviation	23.74	9.55	8.92	5.02	48.89	180.04	165.75	434.65	528.13	273.89	119.77	89.23	87.23
Skewness	3.14	0.71	2.09	1.59	1.67	2.32	3.98	2.72	2.08	1.31	1.74	3.12	1.76
Coefficient of variation	0.75	0.32	0.32	0.21	0.77	0.95	1.39	1.59	1.06	1.06	1.10	1.65	0.62
Percent of annual flow	1.89	1.76	1.64	1.45	3.77	11.25	7.09	16.28	29.68	15.46	6.48	3.23	[1]-0.298

[1]Serial correlation for annual mean flows.

Table E4.3. Serial correlation for 1-year lag for monthly mean flow for station 06400500, Cheyenne River near Hot Springs (October 1943 to September 1972)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.012	0.192	0.015	0.124	0.134	0.217	-0.139	-0.201	-0.124	-0.109	-0.081	-0.129

Table E4.4. Correlation matrix for monthly mean flow for station 06400500, Cheyenne River near Hot Springs (October 1943 to September 1972)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.663	0.188	0.287	0.492	0.122	-0.063	-0.158	0.212	0.106	-0.022	-0.039
Nov.	*	1.000	0.364	0.389	0.570	0.414	-0.045	-0.163	0.143	0.276	-0.150	-0.179
Dec.	*	*	1.000	0.644	0.194	0.227	-0.078	-0.155	-0.050	-0.092	-0.130	-0.201
Jan.	*	*	*	1.000	0.126	0.290	-0.104	-0.229	0.178	0.054	-0.148	-0.061
Feb.	*	*	*	*	1.000	0.551	-0.094	0.075	0.263	-0.168	-0.339	-0.070
Mar.	*	*	*	*	*	1.000	0.104	-0.118	0.059	-0.146	0.025	-0.156
Apr.	*	*	*	*	*	*	1.000	0.147	-0.010	-0.110	0.462	0.161
May	*	*	*	*	*	*	*	1.000	0.661	0.142	-0.055	-0.092
June	*	*	*	*	*	*	*	*	1.000	0.281	-0.108	0.078
July	*	*	*	*	*	*	*	*	*	1.000	0.200	0.153
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.478
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E4.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06400500, Cheyenne River near Hot Springs

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1943	3.00	3	4.00	3	4.00	2	4.50	1	8.00	1	13.7	3	17.2	5	21.2	11	22.8	9
1944	5.00	5	6.33	5	7.29	6	8.36	5	16.4	21	17.7	12	18.4	9	20.5	10	22.6	8
1945	11.0	20	12.7	20	14.3	24	15.3	24	17.1	22	20.6	19	21.9	14	22.4	14	30.9	20
1946	3.90	4	4.13	4	5.49	4	7.10	3	9.71	4	24.3	24	30.9	27	36.0	27	82.7	29
1947	2.80	2	2.93	2	4.83	3	13.4	16	17.8	24	19.6	17	22.0	16	26.9	19	26.7	17
1948	9.00	13	11.0	19	11.0	16	13.6	17	15.0	15	16.4	8	22.9	18	24.5	16	24.4	14
1949	12.0	21	12.7	21	13.4	22	14.0	20	16.1	18	20.0	18	22.5	17	22.3	13	24.0	13
1950	14.0	25	15.3	26	15.6	26	15.9	25	17.9	25	23.0	22	23.1	20	23.5	15	23.8	12
1951	10.0	17	10.0	16	11.0	17	12.9	14	16.0	17	23.1	23	29.5	25	29.9	23	37.2	25
1952	9.00	14	9.00	13	9.43	12	10.3	10	14.0	11	16.0	7	17.2	6	17.5	4	23.3	10
1953	13.0	23	13.0	23	13.1	20	13.1	15	17.1	23	20.9	20	21.1	13	21.9	12	25.0	16
1954	10.0	18	10.3	18	11.9	19	12.7	13	13.6	10	15.7	6	17.3	7	18.4	7	19.4	5
1955	7.00	10	7.67	10	8.57	9	9.07	8	13.3	8	24.7	25	37.9	28	37.7	28	61.5	28
1956	10.0	19	10.0	17	10.0	14	14.7	22	15.0	16	15.6	5	16.0	3	18.0	5	18.7	4
1957	14.0	26	14.0	25	15.0	25	17.5	26	20.8	27	22.1	21	23.3	21	29.5	22	29.6	19
1958	5.00	6	7.00	8	9.14	11	9.21	9	12.3	7	14.8	4	16.7	4	17.3	3	17.8	3
1959	6.00	7	6.67	7	7.29	7	8.57	6	9.10	3	12.3	2	14.0	2	15.0	2	16.7	2
1960	6.00	8	6.33	6	6.71	5	7.14	4	8.83	2	10.4	1	11.9	1	13.6	1	16.0	1
1961	9.00	15	9.33	14	9.71	13	11.0	11	13.5	9	17.7	13	19.8	11	20.1	9	23.6	11
1962	7.00	11	7.67	11	9.00	10	11.4	12	14.1	13	25.9	26	28.4	23	34.2	26	38.3	26
1963	7.20	12	8.27	12	11.5	18	13.8	19	16.1	19	18.3	15	18.5	10	18.8	8	22.2	7
1964	12.0	22	12.7	22	13.6	23	14.9	23	16.1	20	16.9	10	17.9	8	18.3	6	19.4	6
1965	16.0	28	17.0	28	19.3	28	23.1	28	24.8	28	26.1	27	26.7	22	27.9	20	36.8	24
1966	13.0	24	13.0	24	13.1	21	13.6	18	14.0	12	18.9	16	38.5	29	47.2	29	53.8	27
1967	15.0	27	15.7	27	17.7	27	18.5	27	20.0	26	29.1	29	30.3	26	30.1	24	33.2	23
1968	23.0	29	23.7	29	24.3	29	25.9	29	26.0	29	26.9	28	28.6	24	30.2	25	31.9	22
1969	9.90	16	9.90	15	10.8	15	14.1	21	14.8	14	18.0	14	20.6	12	25.4	18	27.4	18
1970	1.20	1	1.60	1	2.23	1	4.58	2	9.97	5	16.9	11	21.9	15	24.6	17	24.8	15
1971	6.80	9	7.10	9	7.44	8	8.74	7	9.97	6	16.5	9	23.0	19	28.0	21	31.1	21

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E4.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days in year ending September 30, for station 06400500, Cheyenne River near Hot Springs

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1944	6,290	7	4,447	8	2,224	8	1,160	14	850	12	508	14	401	13	366	11	260	13
1945	3,030	16	2,223	15	1,425	18	851	18	540	16	467	15	397	14	311	15	257	15
1946	4,780	11	3,547	10	1,985	11	1,346	11	976	9	615	10	453	10	378	9	280	9
1947	5,920	9	4,627	6	2,469	7	1,809	6	1,092	7	599	11	422	12	343	12	273	11
1948	2,360	18	1,670	20	1,503	16	924	16	533	18	429	16	312	17	269	16	262	12
1949	2,070	20	1,980	17	1,859	14	1,488	9	1,001	8	593	12	461	9	411	8	282	8
1950	1,420	24	799	26	508	26	309	26	217	26	177	24	164	23	162	22	127	23
1951	3,740	14	3,037	12	2,162	9	1,116	15	751	13	676	6	606	6	466	7	318	7
1952	7,320	4	3,787	9	1,957	12	1,277	12	712	14	674	7	466	8	375	10	276	10
1953	1,380	25	1,025	24	708	23	494	22	327	23	191	22	176	22	181	20	152	20
1954	3,900	13	2,104	16	964	21	473	23	252	25	152	26	163	24	127	25	98.6	25
1955	4,260	12	2,840	13	2,060	10	1,397	10	918	11	617	9	528	7	466	6	392	4
1956	2,320	19	1,326	22	705	24	358	25	336	22	185	23	137	25	145	24	113	24
1957	8,270	3	6,330	3	3,756	4	2,291	4	1,556	4	912	4	638	4	508	4	364	5
1958	4,950	10	3,447	11	1,922	13	1,518	8	1,103	6	636	8	437	11	342	13	257	14
1959	1,170	26	975	25	580	25	408	24	256	24	153	25	110	27	102	27	78.8	27
1960	704	28	474	28	320	27	211	27	127	28	79.1	28	73.1	28	67.3	28	51.5	28
1961	849	27	567	27	320	28	174	28	110	29	73.9	29	59.8	29	49.3	29	41.9	29
1962	13,200	1	10,230	1	6,369	1	4,153	1	3,760	1	2,410	1	1,717	1	1,295	1	880	1
1963	2,020	21	1,897	18	1,542	15	1,165	13	710	15	429	17	312	16	259	17	209	17
1964	1,950	22	1,477	21	1,137	20	906	17	538	17	308	18	228	19	193	19	136	21
1965	6,730	5	5,653	4	3,319	5	1,833	5	1,188	5	800	5	627	5	482	5	343	6
1966	1,600	23	1,245	23	893	22	543	21	341	21	290	20	206	20	158	23	162	19
1967	6,560	6	5,623	5	3,779	3	3,100	3	2,016	3	1,134	3	817	3	688	3	520	2
1968	3,490	15	2,707	14	1,479	17	792	20	471	20	303	19	240	18	194	18	163	18
1969	5,980	8	4,480	7	3,056	6	1,744	7	943	10	537	13	393	15	316	14	250	16
1970	493	29	327	29	219	29	149	29	145	27	118	27	120	26	111	26	88.6	26
1971	11,900	2	8,027	2	4,311	2	3,601	2	2,061	2	1,262	2	910	2	717	2	490	3
1972	2,480	17	1,790	19	1,297	19	793	19	493	19	281	21	204	21	177	21	135	22

Table E5.1. Mean flow, in cubic feet per second, for station 06400875, Horsehead Creek at Oelrichs

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1983	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.19	0.008	0.009	0.000	(2)
1984	0.000	0.000	0.000	0.046	0.080	0.087	16.5	53.0	6.62	.15	.10	.000	6.42
1985	.000	.000	.000	.000	.005	.12	.052	.000	.000	.000	.000	.000	.015
1986	.000	.000	.000	.000	1.40	58.9	83.3	7.81	187	14.2	.74	.008	29.3
1987	.10	.076	.15	.19	.12	18.5	46.8	1.87	1.38	.013	.000	.000	5.75
1988	.000	.000	.020	.038	.095	.087	.031	.20	.000	1.16	.000	.000	.14
1989	.000	.000	.000	.000	.000	.000	.000	.000	.000	.020	.000	.000	.002
1990	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1991	.000	.016	.000	.000	.000	.009	.095	246	62.3	3.54	.24	.000	26.3
1992	.000	.000	.000	.049	.59	1.12	.48	.092	.24	.000	.000	.000	.21
1993	.000	.000	.000	.000	.000	24.9	38.4	2.48	37.5	31.4	.63	.000	11.3

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E5.2. Statistics on mean flow, in cubic feet per second, for station 06400875, Horsehead Creek at Oelrichs (October 1983 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	10	10	10	10	10	10	10	10	10	10	10	10	10
Maximum	0.10	0.076	0.15	0.19	1.40	58.9	83.3	246	187	31.4	0.74	0.008	29.3
Percentile													
75th	0.000	0.004	0.005	0.047	0.24	20.1	40.5	19.1	43.7	6.20	0.34	0.000	15.0
50th	0.000	0.000	0.000	0.000	0.042	0.10	0.29	1.03	0.81	0.085	0.000	0.000	2.98
25th	0.000	0.000	0.000	0.000	0.000	0.007	0.023	0.000	0.000	0.000	0.000	0.000	0.012
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mean	0.01	0.01	0.02	0.03	0.23	10.37	18.57	31.15	29.50	5.05	0.17	0.001	7.94
Standard deviation	0.03	0.02	0.05	0.06	0.45	19.31	28.73	77.24	59.25	10.26	0.28	0.00	11.16
Skewness	3.16	2.93	3.06	2.48	2.44	2.13	1.55	2.93	2.52	2.35	1.54	3.16	1.35
Coefficient of variation	3.16	2.61	2.77	1.84	1.96	1.86	1.55	2.48	2.01	2.03	1.65	3.16	1.41
Percent of annual flow	0.01	0.01	0.02	0.03	0.24	10.91	19.52	32.75	31.02	5.31	0.18	0.00	[1]-0.337

[1]Serial correlation for annual mean flows.

Table E5.3. Serial correlation for 1-year lag for monthly mean flow for station 06400875, Horsehead Creek at Oelrichs (October 1983 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.125	-0.185	-0.011	-0.088	-0.212	0.069	0.160	-0.167	-0.255	-0.265	-0.328	-0.125

Table E5.4. Correlation matrix for monthly mean flow for station 06400875, Horsehead Creek at Oelrichs (October 1983 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.978	0.991	0.935	-0.085	0.148	0.345	-0.133	-0.167	-0.173	-0.212	-0.111
Nov.	*	1.000	.966	.896	-.123	.108	.298	.073	-.126	-.184	-.195	-.135
Dec.	*	*	1.000	.945	-.100	.124	.317	-.153	-.191	-.191	-.242	-.127
Jan.	*	*	*	1.000	-.062	.022	.240	-.176	-.283	-.288	-.336	-.191
Feb.	*	*	*	*	1.000	.790	.701	-.179	.815	.204	.571	.917
Mar.	*	*	*	*	*	1.000	.962	-.199	.866	.614	.845	.883
Apr.	*	*	*	*	*	*	1.000	-.203	.765	.549	.763	.792
May	*	*	*	*	*	*	*	1.000	.195	-.071	.094	-.106
June	*	*	*	*	*	*	*	*	1.000	.469	.843	.934
July	*	*	*	*	*	*	*	*	*	1.000	.863	.314
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.707
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E5.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06400875, Horsehead Creek at Oelrichs

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1984	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
1985	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2
1986	.0000	3	.0000	3	.0000	3	.0000	3	.0010	9	.042	9	.060	9	.077	9	.11	9
1987	.0000	4	.0000	4	.0000	4	.0000	4	.0000	3	.0000	3	.0000	3	.0000	3	.003	7
1988	.0000	5	.0000	5	.0000	5	.0000	5	.0000	4	.0000	4	.0000	4	.0000	4	.0000	3
1989	.0000	6	.0000	6	.0000	6	.0000	6	.0000	5	.0000	5	.0000	5	.0000	5	.0000	4
1990	.0000	7	.0000	7	.0000	7	.0000	7	.0000	6	.0000	6	.0000	6	.0000	6	.0000	5
1991	.0000	8	.0000	8	.0000	8	.0000	8	.0000	7	.0000	7	.0000	7	.0000	7	.016	8
1992	.0000	9	.0000	9	.0000	9	.0000	9	.0000	8	.0000	8	.0000	8	.0000	8	.0000	6

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E5.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06400875, Horsehead Creek at Oelrichs

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1984	358	3	308	3	229	3	134	3	69.9	3	38.3	3	25.9	4	19.5	4	12.8	4
1985	.26	9	.26	8	.24	8	.21	8	.16	8	.092	8	.062	8	.046	8	.030	8
1986	2,920	2	1,591	2	761	2	371	2	192	2	135	2	94.3	2	84.9	1	58.4	1
1987	265	5	179	5	140	4	94.9	4	61.5	4	33.1	5	22.6	5	17.3	5	11.4	5
1988	30.0	6	11.8	6	5.12	6	2.39	6	1.20	7	.65	7	.47	7	.36	7	.27	7
1989	.56	8	.19	9	.090	9	.042	9	.021	9	.010	9	.007	9	.005	9	.003	9
1990	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10
1991	4,080	1	1,750	1	806	1	459	1	308	1	160	1	107	1	80.1	2	52.6	2
1992	2.50	7	2.47	7	2.29	7	1.95	7	1.46	6	1.00	6	.74	6	.62	6	.43	6
1993	344	4	191	4	114	5	60.1	5	57.3	5	35.0	4	29.6	3	30.8	3	22.5	3

Table E6.1. Mean flow, in cubic feet per second, for station 06401500, Cheyenne River below Angostura Dam

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	(1)	28.0	20.2	27.3	111	60.0	29.0	203	950	302	51.1	328	(2)
1947	157	56.6	29.2	26.9	169	147	108	54.3	905	469	69.1	22.0	184
1948	24.2	21.7	37.9	35.6	79.0	518	83.4	76.1	433	305	150	14.0	149
1949	27.3	46.6	27.6	23.2	127	1057	173	256	238	29.4	33.4	26.6	173
1950	2.78	.000	.000	.000	.56	1.32	1.03	18.2	47.5	123	89.0	32.9	26.6
1951	11.2	8.36	4.48	1.36	1.29	1.15	1.01	.42	.96	1.46	1.09	1.56	2.88
[3]1952	1.02	.99	20.8	43.4	175	170	188	87.5	57.5	149	151	158	99.9
1953	104	103	108	118	122	119	111	117	2.04	96.6	108	39.2	95.9
1954	2.17	1.34	42.7	41.2	23.1	18.1	.96	2.58	1.58	1.84	1.57	2.25	11.6
1955	2.01	1.65	2.98	1.59	1.97	2.19	115	205	272	77.6	56.1	53.6	66.1
1956	56.1	88.9	85.1	84.2	89.8	88.5	89.2	90.6	38.2	38.2	24.5	20.0	66.0
1957	.90	1.23	1.01	1.20	1.28	1.25	1.03	457	569	31.1	1.68	1.52	89.2
1958	1.58	33.7	54.4	57.1	57.9	55.7	1.17	3.22	1.40	146	201	3.94	51.9
1959	61.4	48.9	54.5	56.8	63.9	1.36	1.33	1.51	3.53	1.88	2.74	1.26	24.7
1960	1.26	1.26	1.16	.99	1.43	1.98	1.53	1.47	2.40	1.67	1.04	.70	1.41
1961	.81	.79	.75	.84	.83	.88	.96	.78	.96	.89	.70	.79	.83
1962	1.25	1.22	1.14	1.15	1.18	1.18	.87	783	2,802	1,210	48.0	1.47	404
1963	1.92	1.49	1.07	1.05	3.81	18.5	56.8	77.0	689	1.70	1.36	1.45	70.6
1964	1.60	1.53	1.17	1.25	1.21	1.11	.97	.94	153	13.6	1.28	1.00	14.7
1965	1.02	1.20	1.03	.96	1.12	1.22	1.00	71.3	939	177	1.52	1.38	99.2
1966	1.43	1.43	1.17	1.00	1.89	116	73.0	6.79	1.30	1.19	1.28	1.24	17.4
1967	1.27	1.51	1.23	1.47	2.17	174	71.1	115	1,763	196	1.83	1.34	193
1968	5.29	1.67	.97	.97	1.29	1.31	1.32	1.00	308	14.8	1.62	2.10	28.0
1969	2.08	1.61	1.05	1.19	1.29	25.2	16.7	6.34	1.50	724	2.06	1.28	66.6
1970	1.21	1.40	1.25	1.21	.66	.82	1.07	11.9	1.91	1.15	1.08	1.21	2.09
1971	1.31	1.13	1.16	1.27	1.05	.94	3.55	1,384	968	2.75	.72	.83	198
1972	1.29	1.28	1.26	1.08	1.09	1.69	1.99	2.35	25.2	2.66	1.26	1.01	3.48
1973	1.20	1.30	1.15	1.31	1.58	1.40	1.40	102	1.93	1.39	1.37	1.44	9.95
1974	1.55	1.62	1.66	79.9	211	76.2	107	2.11	1.56	1.56	1.55	1.41	39.3
1975	1.51	1.43	1.39	1.35	1.20	1.57	1.46	1.14	1.38	1.45	1.28	1.01	1.35
1976	1.08	1.39	1.01	1.29	1.36	1.31	1.12	1.05	1.28	1.25	1.16	.87	1.18
1977	1.31	1.21	1.20	1.25	1.19	1.26	1.14	1.04	.78	2.03	.82	.91	1.18
1978	1.11	1.44	1.08	1.01	1.13	1.81	1.69	2,203	171	110	88.1	1.51	219
1979	(1)	(1)	(1)	(1)	1.78	173	141	2.09	2.13	1.84	(1)	(1)	(2)
1980	(1)	(1)	(1)	(1)	84.3	130	64.0	3.61	3.37	2.15	(1)	(1)	(2)
1981	(1)	(1)	(1)	(1)	2.96	2.73	1.68	1.98	2.17	1.59	(1)	(1)	(2)
1982	(1)	(1)	(1)	(1)	2.06	2.32	2.75	2.75	278	42.0	(1)	(1)	(2)
1983	(1)	(1)	(1)	23.7	32.2	84.5	74.2	88.3	16.8	1.90	(1)	(1)	(2)
1984	(1)	(1)	(1)	(1)	1.72	86.4	132	577	232	2.74	(1)	(1)	(2)
1985	(1)	(1)	(1)	(1)	1.39	1.37	1.45	1.46	1.74	1.75	(1)	(1)	(2)
1986	(1)	(1)	(1)	(1)	1.29	1.69	2.02	136	651	66.6	(1)	(1)	(2)
1987	(1)	(1)	(1)	(1)	62.3	529	186	99.7	93.0	3.78	(1)	(1)	(2)
1988	(1)	(1)	(1)	(1)	1.77	1.44	1.41	1.47	1.40	1.70	(1)	(1)	(2)
1989	(1)	(1)	(1)	(1)	1.12	1.29	1.09	1.07	1.44	1.01	(1)	(1)	(2)
1990	(1)	(1)	(1)	(1)	1.08	1.30	1.17	1.93	1.93	1.77	(1)	(1)	(2)
1991	(1)	(1)	(1)	(1)	.82	.92	1.17	595	1312	4.72	(1)	(1)	(2)
1992	(1)	(1)	(1)	(1)	2.23	1.62	1.12	1.31	1.66	1.62	(1)	(1)	(2)
1993	(1)	(1)	(1)	(1)	1.32	1.87	29.5	182	252	117	(1)	(1)	(2)

[1]Indicates a no-value month.

[2]Incomplete water year.

[3]Angostura Reservoir effectively filled during water year 1952.

Table E6.2. Statistics on mean flow, in cubic feet per second, for station 06401500, Cheyenne River below Angostura Dam (October 1952 through September 1978)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	26	26	26	26	26	26	26	26	26	26	26	26	26
Maximum	104	103	108	118	211	174	115	2,203	2,802	1,210	201	53.6	404
Percentile													
75th	2.03	1.63	1.99	11.5	8.63	32.8	60.4	115	373	99.9	8.18	1.66	90.9
50th	1.37	1.43	1.17	1.25	1.32	1.63	1.43	6.56	2.97	2.70	1.53	1.36	33.7
25th	1.21	1.25	1.06	1.04	1.17	1.24	1.06	1.39	1.47	1.53	1.23	1.01	3.13
Minimum	0.81	0.79	0.75	0.84	0.66	0.82	0.87	0.78	0.78	0.89	0.70	0.70	0.83
Mean	9.91	11.72	14.25	17.72	22.94	27.48	25.55	217.27	335.42	109.93	21.29	5.57	68.33
Standard deviation	24.70	27.21	29.27	33.14	49.72	47.47	40.94	508.41	659.55	267.99	46.53	12.74	93.33
Skewness	3.03	2.71	2.22	1.89	2.76	1.89	1.33	3.12	2.70	3.47	2.86	3.14	2.26
Coefficient of variation	2.49	2.32	2.05	1.87	2.17	1.73	1.60	2.34	1.97	2.44	2.19	2.29	1.37
Percent of annual flow	1.21	1.43	1.74	2.16	2.80	3.36	3.12	26.53	40.95	13.42	2.60	0.68	[1]-0.200

[1]Serial correlation for annual mean flows.

Table E6.3. Serial correlation for 1-year lag for monthly mean flow for station 06401500, Cheyenne River below Angostura Dam (October 1952 through September 1978)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.100	-0.020	0.267	0.115	-0.065	0.127	0.046	-0.158	-0.018	-0.152	-0.116	0.218

Table E6.4. Correlation matrix for monthly mean flow for station 06401500, Cheyenne River below Angostura Dam (October 1952 through September 1978)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.939	0.880	0.795	0.529	0.379	0.428	-0.102	-0.175	-0.072	0.276	0.509
Nov.	*	1.000	.951	.850	.563	.445	.445	-.112	-.194	-.064	.443	.512
Dec.	*	*	1.000	.885	.559	.421	.370	-.144	-.228	-.081	.510	.476
Jan.	*	*	*	1.000	.878	.493	.532	-.171	-.256	-.110	.443	.413
Feb.	*	*	*	*	1.000	.451	.586	-.158	-.222	-.114	.262	.256
Mar.	*	*	*	*	*	1.000	.693	-.171	.117	-.002	.218	.225
Apr.	*	*	*	*	*	*	1.000	-.147	-.022	-.080	.156	.696
May	*	*	*	*	*	*	*	1.000	.317	.193	.238	-.044
June	*	*	*	*	*	*	*	*	1.000	.682	-.015	-.103
July	*	*	*	*	*	*	*	*	*	1.000	.174	-.037
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.383
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E6.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06401500, Cheyenne River below Angostura Dam

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1953	1.00	22	1.00	20	1.01	21	1.08	22	1.34	24	1.76	24	13.9	24	21.0	23	21.6	23
1954	.90	19	.90	17	.90	16	.92	15	.96	12	1.63	23	1.61	22	1.74	21	1.79	20
1955	.80	13	1.40	25	1.59	25	4.06	25	48.7	25	53.0	25	54.2	25	56.3	25	66.0	25
1956	.50	2	.53	3	.59	3	.69	5	.88	9	1.03	10	1.03	6	1.07	7	1.14	8
1957	.70	9	.73	10	.77	8	.84	10	1.00	18	1.54	22	1.59	21	1.90	22	17.0	22
1958	1.00	23	1.00	21	1.00	20	1.06	21	1.17	21	1.49	21	1.94	23	36.8	24	47.0	24
1959	.90	20	.90	18	.91	18	.96	19	.98	14	1.07	14	1.09	9	1.17	12	1.20	11
1960	.60	5	.67	7	.69	6	.70	6	.70	4	.74	1	.76	1	.76	1	.78	1
1961	.60	6	.60	4	.60	4	.64	3	.69	3	.74	2	.78	2	.82	2	.85	2
1962	.80	14	.80	12	.80	10	.80	9	.87	8	1.04	11	1.19	16	1.33	18	1.57	19
1963	.70	10	.70	9	.80	11	.90	12	1.10	19	1.16	17	1.19	17	1.19	14	1.31	15
1964	.70	11	.73	11	.79	9	.79	8	.83	7	.91	6	1.03	7	1.05	6	1.05	4
1965	.70	12	.80	13	.84	13	.92	16	.99	16	1.06	13	1.16	14	1.24	16	1.30	14
1966	1.00	24	1.00	22	1.06	23	1.12	23	1.17	22	1.22	18	1.23	18	1.22	15	1.28	13
1967	.88	17	.88	16	.88	14	.89	11	.92	10	.96	7	1.07	8	1.12	9	1.91	21
1968	.82	15	.88	15	.88	15	.90	14	.98	15	1.11	16	1.17	15	1.24	17	1.49	17
1969	.50	3	.50	2	.51	2	.53	2	.59	2	.74	3	.89	4	.99	4	1.09	6
1970	.55	4	.65	6	.84	12	.90	13	.93	11	1.00	9	1.09	10	1.11	8	1.15	9
1971	.46	1	.48	1	.50	1	.50	1	.57	1	.75	4	.93	5	1.02	5	1.07	5
1972	.91	21	.91	19	.93	19	.95	18	.98	13	1.08	15	1.14	13	1.17	13	1.20	12
1973	.88	18	1.06	24	1.11	24	1.24	24	1.27	23	1.36	20	1.39	20	1.44	20	1.50	18
1974	1.00	25	1.00	23	1.03	22	1.04	20	1.14	20	1.26	19	1.32	19	1.34	19	1.38	16
1975	.84	16	.87	14	.91	17	.94	17	.99	17	1.04	12	1.11	12	1.12	10	1.17	10
1976	.67	8	.69	8	.72	7	.75	7	.82	6	.99	8	1.09	11	1.12	11	1.12	7
1977	.62	7	.64	5	.66	5	.68	4	.74	5	.80	5	.87	3	.96	3	1.04	3

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E6.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06401500, Cheyenne River below Angostura Dam

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1953	162	17	159	16	158	16	156	16	125	15	122	13	120	12	118	10	116	10
1954	53.0	21	45.7	21	43.6	21	43.0	20	42.7	19	42.1	19	36.1	19	31.6	18	21.4	18
1955	1,440	11	1,001	11	529	12	377	11	343	9	254	9	217	9	177	9	130	9
1956	112	19	111	18	95.0	17	95.1	17	94.0	17	92.7	15	91.2	14	90.2	13	88.4	11
1957	6,620	6	4,037	7	2,100	7	1,270	7	969	6	536	6	358	6	269	6	177	6
1958	2,790	9	1376	10	727	10	600	9	334	10	180	10	121	11	91.3	12	69.8	13
1959	93.0	20	92.0	20	65.7	19	66.8	18	65.8	18	62.1	17	58.2	16	56.6	15	47.3	15
1960	19.0	23	10.3	23	5.37	23	3.42	22	2.72	22	2.07	22	1.89	22	1.88	22	1.75	22
1961	3.80	24	2.73	24	1.63	25	1.15	26	.99	26	.93	26	.90	26	.90	26	.88	26
1962	20,600	1	14,670	2	8,671	1	4,859	1	3,543	1	2,394	1	1,637	1	1,228	1	805	1
1963	2,130	10	1,857	9	1,519	8	1,210	8	689	8	391	7	278	7	211	7	139	7
1964	886	12	754	12	534	11	304	13	165	13	83.5	16	56.0	17	42.3	17	28.1	17
1965	6,780	5	5,540	5	3,111	5	1,702	5	984	5	575	5	399	5	299	5	197	5
1966	652	15	552	15	372	15	236	14	141	14	98.9	14	66.7	15	50.5	16	33.5	16
1967	8,830	4	6,533	4	4,050	4	2,940	4	1,838	4	999	4	698	4	550	4	383	4
1968	3,260	8	2,010	8	1,067	9	526	10	322	11	162	12	108	13	81.8	14	54.1	14
1969	5,490	7	4,050	6	2,830	6	1,494	6	749	7	375	8	252	8	193	8	131	8
1970	153	18	106	19	46.7	20	22.9	21	12.5	21	7.10	21	5.11	21	4.10	21	3.08	21
1971	15,900	3	10,220	3	5,267	3	3,972	3	2,270	3	1,200	3	801	3	601	3	395	3
1972	173	16	136	17	89.6	18	49.2	19	26.0	20	14.2	20	10.2	20	8.09	20	5.80	20
1973	696	13	575	14	402	14	209	15	105	16	53.7	18	36.3	18	27.5	19	18.6	19
1974	694	14	597	13	454	13	333	12	254	12	178	11	147	10	116	11	76.9	12
1975	1.90	26	1.80	25	1.69	24	1.63	24	1.61	24	1.54	23	1.45	23	1.43	23	1.41	23
1976	2.00	25	1.57	26	1.50	26	1.45	25	1.39	25	1.37	25	1.33	25	1.27	25	1.26	25
1977	33.0	22	13.3	22	6.23	22	3.37	23	2.08	23	1.48	24	1.36	24	1.33	24	1.29	24
1978	19,600	2	15,140	1	7,678	2	4,076	2	2,368	2	1,223	2	878	2	663	2	435	2

Table E7.1. Mean flow, in cubic feet per second, for station 06402000, Fall River at Hot Springs

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1938	(1)	(1)	32.7	30.7	29.5	30.3	29.1	30.4	28.1	28.5	28.2	67.2	(2)
1939	29.9	29.7	27.9	30.3	30.6	30.3	27.0	25.7	27.8	28.0	27.8	27.1	28.5
1940	29.2	30.4	31.3	31.5	29.3	30.5	34.2	30.7	32.1	31.6	29.0	28.9	30.7
1941	29.5	30.8	32.0	30.2	30.3	29.5	32.0	31.9	31.4	33.0	40.1	28.6	31.6
1942	31.8	28.2	25.5	28.1	30.0	28.8	28.7	28.7	31.5	29.8	28.6	31.0	29.2
1943	29.4	26.9	23.9	27.7	29.0	39.5	29.0	28.9	31.1	29.0	28.0	25.8	29.0
1944	29.6	28.8	30.3	28.9	26.1	28.3	27.4	30.5	27.3	33.3	33.0	31.1	29.6
1945	31.5	32.5	30.4	30.9	31.7	33.8	32.1	32.3	30.8	29.4	33.6	28.6	31.5
1946	29.5	28.1	30.3	26.3	27.4	25.8	23.1	30.8	31.3	27.7	25.2	26.2	27.6
1947	29.2	(1)	(1)	29.0	31.2	27.7	25.5	(1)	48.0	37.9	24.8	29.5	(2)
1948	27.7	30.5	28.5	30.2	29.7	27.1	24.3	25.7	30.2	29.3	36.4	29.9	29.1
1949	31.7	27.6	31.6	32.5	28.9	29.5	29.3	28.6	27.8	25.7	25.3	25.4	28.7
1950	25.6	26.2	27.5	27.1	27.2	27.4	26.0	24.3	24.4	27.2	24.2	26.2	26.1
1951	28.9	29.6	28.3	26.1	25.9	26.3	26.2	25.8	28.1	27.6	26.2	27.1	27.2
[3]1952	29.2	30.6	25.5	25.7	27.8	26.7	28.4	27.0	25.4	28.0	26.3	23.7	27.0
1953	26.8	26.6	25.1	23.5	25.6	27.5	26.2	26.0	24.8	25.8	23.5	25.1	25.5
1954	24.9	26.4	25.1	26.3	26.4	23.5	22.9	26.0	25.2	25.0	23.7	24.3	25.0
1955	23.6	23.8	23.4	23.2	23.9	26.6	21.6	23.5	24.7	23.5	24.5	28.2	24.2
1956	24.9	23.0	24.6	28.0	24.7	23.2	21.9	23.2	21.5	21.4	24.2	24.5	23.8
1957	23.0	22.3	21.0	21.0	21.8	21.8	21.8	23.1	26.6	22.6	22.1	24.6	22.6
1958	24.7	24.2	23.3	23.3	24.9	25.7	24.5	23.2	24.5	25.7	22.7	23.1	24.2
1959	24.2	25.1	25.1	24.2	23.9	23.6	25.3	25.1	22.4	21.7	21.0	21.6	23.6
1960	24.5	24.4	23.8	24.9	25.4	25.8	24.9	23.1	22.1	21.6	22.1	22.7	23.8
1961	24.0	23.8	23.8	24.2	24.7	24.7	24.2	23.7	24.4	31.2	20.9	23.5	24.4
1962	23.0	24.0	24.1	23.2	25.0	25.3	22.9	23.0	22.9	24.6	22.2	21.9	23.5
1963	23.8	24.5	22.9	24.1	23.7	25.6	23.6	21.3	23.6	22.5	22.3	27.6	23.8
1964	26.5	25.6	24.5	22.0	22.5	23.4	24.5	26.1	24.0	22.6	22.6	23.8	24.0
1965	24.0	25.1	22.9	23.7	23.5	24.0	24.1	25.9	25.1	24.3	24.3	22.6	24.1
1966	23.4	23.7	23.0	23.9	22.3	25.7	23.3	22.5	22.6	23.9	22.8	22.3	23.3
1967	23.0	23.3	23.4	23.5	24.7	23.7	22.7	22.9	29.7	23.1	20.5	21.0	23.4
1968	22.8	24.0	25.1	23.4	24.2	25.5	24.3	23.7	26.1	24.0	23.0	24.9	24.2
[4]1969	22.9	21.9	19.4	21.7	23.2	20.4	26.8	21.4	25.8	23.2	24.9	23.8	22.9
1970	23.7	20.7	22.7	20.6	21.7	21.7	19.5	19.3	20.3	20.5	21.0	22.5	21.2
1971	22.9	21.7	21.1	21.5	22.1	22.6	23.2	23.2	22.5	19.4	19.6	24.8	22.0
1972	21.4	23.8	26.8	24.0	21.7	22.6	22.6	22.2	19.7	19.5	18.6	17.8	21.7
1973	18.8	20.7	26.5	22.6	24.0	24.1	22.3	21.5	20.3	19.2	19.9	23.4	21.9
1974	20.9	19.3	22.6	22.0	21.0	21.3	20.0	20.9	22.9	20.6	19.5	20.0	20.9
1975	21.9	22.3	21.8	22.3	22.3	22.8	19.9	21.1	20.9	21.1	21.4	20.6	21.5
1976	21.3	20.7	22.1	21.9	20.6	22.6	21.3	19.0	18.3	20.0	22.0	22.1	21.0
1977	22.8	22.2	22.2	21.6	19.8	22.3	20.7	20.9	22.1	22.5	20.2	20.8	21.5
1978	22.5	22.6	21.4	21.0	23.0	25.4	23.8	25.8	22.6	21.9	23.4	19.7	22.8
1979	23.0	21.7	22.4	22.1	23.0	21.3	22.3	23.1	22.3	22.6	23.3	20.7	22.3
1980	22.0	20.6	22.7	24.4	21.7	22.1	22.7	20.1	19.4	18.0	19.3	20.7	21.2
1981	22.2	21.4	21.5	21.2	20.4	20.8	20.5	20.2	17.9	20.0	22.8	21.9	20.9
1982	22.7	21.0	21.0	21.4	21.3	20.0	19.7	22.0	22.3	20.1	22.3	23.4	21.4
1983	21.3	20.9	21.4	20.9	22.7	23.2	22.2	21.0	20.1	20.1	20.1	17.7	21.0
1984	21.0	21.8	19.7	19.4	21.0	21.0	22.3	21.7	23.3	21.6	21.8	23.5	21.5
1985	22.0	22.8	23.0	20.3	24.0	24.6	19.9	21.1	24.3	18.2	19.3	19.5	21.6
1986	22.4	23.1	24.4	23.6	21.5	21.7	21.7	22.1	22.1	21.5	20.5	22.4	22.2
1987	20.8	18.3	19.0	19.9	23.7	26.8	26.8	21.8	20.9	20.9	20.7	22.6	21.8
1988	21.4	20.9	21.8	23.2	23.3	22.1	20.2	22.1	18.7	19.5	21.0	21.5	21.3
1989	21.5	22.8	21.8	21.3	22.5	21.1	21.1	21.7	23.0	21.1	20.2	19.9	21.5
1990	19.3	21.8	22.4	22.4	23.3	23.4	23.5	23.9	24.4	18.8	19.7	20.5	21.9
1991	19.9	20.0	19.3	20.6	22.1	22.5	22.4	23.5	21.8	21.0	20.7	21.1	21.2
1992	21.8	22.1	22.5	22.9	22.7	21.8	21.3	21.8	20.5	20.2	20.5	21.9	21.7
1993	22.3	23.1	22.7	22.1	21.5	22.4	22.9	22.4	23.3	21.4	21.2	21.8	22.3

[1]Indicates a no-value month.

[2]Incomplete water year.

[3]Cold Brook Reservoir constructed during water year 1952.

[4]Cottonwood Springs Reservoir constructed during water year 1969.

Table E7.2. Statistics on mean flow, in cubic feet per second, for station 06402000, Fall River at Hot Springs (October 1938 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	55	54	54	55	55	55	55	54	55	55	55	55	54
Maximum	31.8	32.5	32.0	32.5	31.7	39.5	34.2	32.3	48.0	37.9	40.1	31.1	31.6
Percentile													
75th	26.8	26.5	25.5	26.3	26.1	26.7	26.0	25.8	26.6	27.2	24.8	25.8	25.6
50th	23.0	23.5	23.3	23.4	23.7	24.0	23.2	23.1	23.6	22.6	22.3	23.4	23.3
25th	22.0	21.8	22.0	21.7	22.1	22.3	21.8	21.7	22.1	20.6	20.7	21.5	21.6
Minimum	18.8	18.3	19.0	19.4	19.8	20.0	19.5	19.0	17.9	18.0	18.6	17.7	20.9
Mean	24.41	24.22	24.19	24.21	24.48	24.86	24.03	24.02	24.67	23.89	23.54	23.73	24.08
Standard deviation	3.42	3.37	3.25	3.30	3.08	3.58	3.27	3.25	4.87	4.38	4.31	3.24	3.07
Skewness	0.73	0.71	0.86	0.89	0.81	1.61	1.10	0.97	2.21	1.08	1.96	0.52	1.05
Coefficient of variation	0.14	0.14	0.13	0.14	0.13	0.14	0.14	0.14	0.20	0.18	0.18	0.14	0.13
Percent of annual flow	8.41	8.34	8.33	8.34	8.43	8.57	8.28	8.27	8.50	8.23	8.11	8.18	[1]0.935

[1]Serial correlation for annual mean flows.

Table E7.3. Correlation matrix for monthly mean flow for station 06402000, Fall River at Hot Springs (October 1938 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.906	0.775	0.851	0.853	0.750	0.758	0.846	0.708	0.822	0.767	0.777
Nov.	*	1.000	.841	.847	.866	.717	.762	.855	.797	.848	.809	.731
Dec.	*	*	1.000	.877	.770	.613	.651	.771	.647	.714	.689	.629
Jan.	*	*	*	1.000	.875	.726	.737	.773	.641	.757	.755	.725
Feb.	*	*	*	*	1.000	.822	.785	.826	.776	.820	.757	.737
Mar.	*	*	*	*	*	1.000	.782	.743	.591	.686	.650	.623
Apr.	*	*	*	*	*	*	1.000	.813	.579	.713	.710	.635
May	*	*	*	*	*	*	*	1.000	.824	.820	.776	.684
June	*	*	*	*	*	*	*	*	1.000	.836	.574	.684
July	*	*	*	*	*	*	*	*	*	1.000	.756	.782
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.774
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E7.4. Serial correlation for 1-year lag for monthly mean flow for station 06402000, Fall River at Hot Springs (October 1938 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.873	0.835	0.673	0.760	0.796	0.559	0.609	0.795	0.617	0.743	0.626	0.614

Table E7.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06402000, Fall River at Hot Springs

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1938	27.0	53	27.0	53	27.0	53	27.3	53	27.6	52	28.1	51	28.2	51	28.7	51	29.8	51
1939	17.0	18	19.7	35	24.4	51	25.2	51	25.7	50	26.1	48	26.8	48	27.1	46	27.2	45
1940	16.0	7	16.0	7	23.1	47	26.5	52	27.9	53	28.7	53	29.1	53	29.4	52	30.0	52
1941	23.0	48	23.3	51	23.9	49	24.7	49	25.4	48	26.0	47	27.2	49	27.8	49	28.6	49
1942	23.0	49	23.0	48	23.0	45	23.0	43	23.9	42	25.0	43	26.1	45	26.8	45	27.7	46
1943	22.0	43	22.7	46	22.9	44	23.4	45	24.3	46	26.6	50	27.3	50	27.8	50	28.1	48
1944	24.0	52	24.0	52	24.6	52	24.9	50	26.7	51	28.4	52	28.4	52	29.5	53	30.5	53
1945	23.0	50	23.0	49	23.3	48	24.1	47	25.4	49	26.4	49	26.4	46	27.4	48	27.9	47
1946	(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)	
1947	(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)	
1948	22.0	44	22.7	47	23.0	46	23.6	46	24.1	44	25.0	44	26.7	47	27.3	47	29.3	50
1949	23.0	51	23.0	50	23.9	50	24.4	48	24.9	47	25.2	45	25.2	43	25.4	43	25.9	43
1950	22.0	45	22.0	42	22.4	43	22.9	42	24.0	43	24.3	42	24.8	42	25.0	41	25.4	42
1951	21.0	41	22.0	43	22.3	42	23.0	44	24.1	45	25.6	46	26.0	44	26.4	44	26.8	44
1952	18.0	26	18.7	29	20.4	36	21.7	38	23.5	41	23.9	40	24.7	41	25.1	42	25.1	41
1953	16.0	8	16.3	14	17.9	17	20.3	33	22.9	40	24.0	41	23.9	40	24.5	40	24.8	40
1954	21.0	42	21.0	41	21.0	37	21.9	39	22.8	39	23.2	39	23.3	38	23.3	36	23.6	37
1955	20.0	38	20.0	38	20.0	34	20.2	29	21.0	31	22.5	36	23.2	37	23.3	37	24.3	39
1956	16.0	9	16.0	8	17.4	14	18.9	21	20.2	22	20.9	23	21.2	24	21.4	22	21.8	22
1957	18.0	27	19.3	33	20.1	35	20.4	34	21.0	32	22.3	34	22.9	35	23.5	38	23.5	35
1958	22.0	46	22.0	44	22.0	40	22.1	41	22.3	37	22.8	37	23.3	39	23.7	39	23.9	38
1959	17.0	19	17.3	19	17.6	15	17.8	12	19.5	20	21.0	24	21.4	26	21.6	25	22.6	27
1960	20.0	39	20.7	39	21.1	39	21.4	36	21.6	34	21.7	29	21.9	28	22.1	29	22.6	28
1961	16.0	10	16.0	9	16.7	11	19.1	23	20.8	29	22.1	32	22.4	31	22.8	32	23.1	32
1962	19.0	33	19.0	31	19.6	29	20.2	30	21.5	33	22.0	31	22.6	33	22.7	31	22.9	30
1963	16.0	11	17.0	17	18.6	25	20.2	31	20.8	30	21.9	30	22.3	30	22.4	30	23.5	36
1964	20.0	40	20.7	40	21.0	38	21.6	37	21.8	35	22.3	35	22.8	34	23.1	34	23.4	34
1965	22.0	47	22.0	45	22.0	41	22.0	40	22.4	38	23.0	38	23.1	36	23.1	35	23.2	33
1966	19.0	34	19.7	36	19.9	33	21.2	35	21.9	36	22.1	33	22.4	32	22.8	33	22.9	31
1967	19.0	35	19.7	37	19.7	30	20.0	26	20.5	24	20.7	22	21.1	22	21.8	27	22.7	29
1968	17.0	20	17.3	20	17.9	18	18.4	15	19.3	17	20.4	19	20.9	19	21.1	18	21.6	20
1969	14.0	1	15.0	2	16.0	4	18.4	16	20.5	25	21.0	25	21.3	25	21.4	23	21.9	23
1970	16.0	12	16.0	10	16.1	6	17.3	10	18.3	12	19.2	9	19.7	10	19.9	9	20.5	8
1971	17.0	21	17.7	22	17.9	19	17.9	13	18.1	10	19.3	11	20.2	14	21.1	19	21.7	21
1972	16.0	13	16.3	15	16.7	12	16.9	4	17.3	2	17.8	1	18.3	1	18.5	1	19.2	1
1973	16.0	14	16.0	11	16.3	7	16.7	3	18.2	11	19.5	12	19.7	11	20.2	12	20.4	6
1974	17.0	22	17.0	18	17.6	16	18.6	19	19.3	18	19.6	14	19.9	13	20.4	13	20.6	12
1975	17.0	23	17.3	21	18.0	21	18.6	20	19.1	15	20.1	16	20.5	16	20.7	14	20.8	13
1976	15.0	5	15.3	5	15.7	2	16.0	2	17.0	1	18.4	3	18.3	2	19.3	3	20.5	9
1977	18.0	28	18.0	25	18.4	23	18.9	22	19.2	16	20.2	17	20.7	17	21.2	21	21.2	16
1978	17.0	24	17.7	23	17.9	20	18.1	14	19.4	19	21.1	27	21.4	27	21.6	26	21.9	24
1979	19.0	36	19.3	34	19.7	31	20.1	28	20.6	28	21.1	28	21.1	23	21.4	24	21.9	25
1980	16.0	15	16.0	12	16.6	9	17.1	9	17.9	7	18.4	4	18.7	3	19.1	2	19.8	3
1981	16.0	16	16.0	13	16.6	10	17.0	8	17.7	4	18.5	5	19.0	6	19.6	7	20.5	10
1982	14.0	2	15.0	3	15.7	3	16.9	5	17.9	8	20.2	18	21.0	21	20.9	16	21.5	19
1983	14.0	3	14.7	1	15.1	1	15.6	1	17.5	3	18.6	6	19.2	7	19.5	5	19.9	4
1984	19.0	37	19.0	32	19.4	28	20.0	27	20.3	23	21.0	26	21.9	29	21.8	28	22.2	26
1985	14.0	4	15.0	4	16.0	5	16.9	6	18.0	9	18.7	7	18.9	4	19.5	6	20.4	7
1986	16.0	17	16.3	16	17.0	13	17.3	11	17.8	6	18.3	2	18.9	5	19.3	4	20.1	5
1987	18.0	29	18.0	26	18.6	26	19.8	25	20.5	26	20.5	20	20.7	18	21.0	17	21.2	17
1988	15.0	6	15.7	6	16.3	8	16.9	7	17.7	5	18.9	8	19.6	8	20.1	10	20.5	11
1989	18.0	30	18.3	28	18.4	24	18.5	18	18.9	14	19.5	13	19.8	12	20.1	11	20.8	14
1990	17.0	25	17.7	24	18.0	22	18.4	17	18.8	13	19.2	10	19.6	9	19.7	8	19.7	2
1991	18.0	31	18.7	30	19.7	32	20.2	32	20.5	27	20.6	21	20.9	20	21.1	20	21.4	18
1992	18.0	32	18.0	27	19.3	27	19.4	24	19.8	21	20.0	15	20.4	15	20.7	15	21.0	15

[1]Low-flow water year is Apr. 1 to Mar. 31.
[2]Statistic not computed.

Table E7.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06402000, Fall River at Hot Springs

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1970	30.0	19	25.7	22	25.1	18	24.3	18	23.8	13	22.3	24	22.4	17	22.0	21	21.9	18
1971	37.0	8	28.0	11	26.6	11	25.7	10	24.8	9	23.5	9	23.2	7	23.0	8	22.5	8
1972	32.0	15	30.7	6	30.3	3	28.5	2	27.4	2	26.2	2	25.0	3	24.2	4	23.7	2
1973	30.0	20	30.0	9	29.6	6	28.1	5	26.9	3	24.8	4	24.6	4	24.3	3	23.6	3
1974	37.0	9	26.0	19	24.9	20	24.3	19	23.2	21	22.4	22	22.0	21	21.9	22	21.4	23
1975	35.0	10	27.7	13	23.9	24	23.5	23	23.0	23	22.6	19	22.4	18	22.3	17	22.3	13
1976	63.0	2	38.3	2	29.6	7	25.7	11	23.8	14	22.7	18	21.8	24	21.8	23	21.6	21
1977	38.0	5	29.7	10	26.4	13	25.1	13	23.8	15	22.5	20	22.4	19	22.2	19	21.8	19
1978	75.0	1	45.7	1	33.6	1	28.5	3	26.1	5	25.3	3	25.1	2	24.6	2	23.9	1
1979	34.0	12	27.0	14	25.1	19	23.9	21	23.4	20	23.0	12	22.8	14	22.8	10	22.5	9
1980	27.0	21	27.0	15	26.6	12	25.8	9	24.9	7	23.6	8	23.0	9	23.0	9	22.4	11
1981	32.0	16	26.0	20	24.7	21	23.7	22	23.0	24	22.5	21	21.9	22	21.7	24	21.3	24
1982	42.0	4	33.3	3	30.3	4	26.6	7	24.8	10	23.0	13	21.9	23	22.3	18	21.6	22
1983	35.0	11	30.3	7	27.3	9	25.7	12	24.4	11	23.2	11	22.9	11	22.5	15	22.1	17
1984	26.0	23	26.0	21	25.6	15	24.6	16	23.6	16	22.8	17	22.5	16	22.5	16	22.4	12
1985	32.0	17	30.3	8	29.7	5	28.4	4	24.9	8	24.5	5	23.1	8	23.2	7	22.8	7
1986	38.0	6	28.0	12	27.0	10	26.6	8	25.3	6	24.5	6	23.8	6	23.4	6	22.9	6
1987	38.0	7	32.7	4	31.6	2	29.9	1	27.7	1	27.4	1	25.9	1	24.9	1	23.5	4
1988	34.0	13	25.0	24	24.0	22	24.0	20	23.9	12	23.5	10	23.0	10	22.6	13	22.2	15
1989	26.0	24	25.3	23	24.0	23	23.5	24	23.1	22	22.4	23	22.1	20	22.1	20	21.8	20
1990	45.0	3	31.3	5	28.7	8	27.5	6	26.4	4	24.3	7	24.3	5	24.0	5	23.5	5
1991	31.0	18	26.3	17	25.6	16	24.7	15	23.6	17	23.0	14	22.9	12	22.7	12	22.2	16
1992	27.0	22	26.7	16	26.1	14	24.9	14	23.6	18	22.9	16	22.7	15	22.6	14	22.3	14
1993	34.0	14	26.3	18	25.4	17	24.5	17	23.6	19	23.0	15	22.9	13	22.8	11	22.5	10

Table E8.1. Mean flow, in cubic feet per second, for station 06402500, Beaver Creek near Buffalo Gap

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1938	(1)	(1)	9.55	9.55	9.96	8.94	8.10	8.94	4.35	2.69	1.34	56.6	(2)
1939	10.1	9.77	10.0	9.19	10.6	8.84	3.78	1.37	1.54	.55	1.47	2.42	5.78
1940	4.73	5.22	6.94	7.16	9.07	8.55	7.77	4.13	.61	1.16	1.47	3.65	5.02
1941	4.77	8.90	12.0	12.9	11.6	10.3	16.9	5.27	4.43	5.80	4.13	7.27	8.66
1942	7.61	8.23	8.26	7.94	7.00	7.97	5.80	9.61	11.0	10.5	12.1	9.87	8.84
1943	10.4	11.0	9.94	8.94	7.93	11.1	15.5	11.7	19.3	11.0	3.45	3.91	10.3
1944	5.88	7.47	8.77	8.48	9.14	9.74	10.0	11.8	13.4	4.95	.51	3.46	7.79
1945	6.81	10.0	10.9	11.6	9.25	8.42	9.00	3.90	7.04	3.99	4.39	6.05	7.59
1946	8.35	7.20	8.58	7.84	8.29	7.03	1.01	8.25	6.65	2.81	2.16	8.73	6.40
1947	11.2	9.83	9.35	8.90	7.86	8.23	7.53	4.61	27.9	22.2	6.99	9.00	11.1
1948	9.39	10.7	12.2	10.7	9.93	9.26	8.12	3.02	3.28	6.04	4.14	1.77	7.38
1949	7.98	8.63	7.87	8.87	8.75	9.26	5.20	2.30	5.72	.88	.55	4.03	5.81
1950	5.27	3.40	6.94	8.42	10.2	8.61	8.90	6.58	.77	.81	3.97	3.44	5.59
1951	8.23	10.7	10.5	9.90	10.1	7.89	1.50	.74	4.50	5.50	3.39	9.07	6.81
1952	7.94	10.8	9.42	9.29	9.17	8.75	1.29	3.30	3.84	.69	.53	2.02	5.58
1953	2.11	6.87	7.74	8.45	10.1	8.26	1.69	7.35	1.41	.24	1.11	3.24	4.86
1954	1.93	3.79	10.9	10.9	9.42	7.23	1.60	2.16	7.79	1.75	7.06	1.87	5.52
1955	4.87	6.26	10.7	11.1	9.75	9.29	2.87	.87	3.30	.56	18.3	8.22	7.17
1956	6.35	9.20	10.4	11.1	11.1	10.5	6.43	1.76	2.27	1.36	.43	.47	5.93
1957	1.62	5.18	11.9	12.4	10.7	8.38	3.41	9.39	16.6	7.71	2.17	4.12	7.78
1958	9.51	12.0	9.32	10.9	11.5	10.5	10.0	4.40	7.12	11.6	4.23	4.81	8.80
1959	6.71	8.00	10.9	11.0	9.43	8.03	1.70	.92	.67	3.30	1.52	1.55	5.30
1960	4.09	9.64	11.2	10.4	9.69	9.03	1.11	.61	.69	.37	.30	.37	4.78
1961	.67	4.47	10.3	10.9	9.04	4.34	.96	.99	2.41	.38	.25	.96	3.78
1962	1.24	6.23	9.77	9.49	10.1	9.59	1.60	2.45	9.99	15.2	2.24	.81	6.56
1963	9.27	11.3	8.42	9.13	8.60	9.25	7.75	5.55	25.9	11.7	3.69	5.84	9.67
1964	8.22	11.6	9.54	10.4	11.0	9.07	7.88	1.82	4.53	1.95	.61	.68	6.42
1965	1.56	8.96	11.3	11.7	11.7	10.6	7.24	9.25	9.63	6.58	2.52	6.55	8.11
1966	10.8	10.9	11.7	10.4	12.3	9.05	5.62	1.64	.44	8.71	3.05	6.95	7.61
1967	7.12	8.34	10.8	10.9	10.7	9.86	.79	3.37	14.4	6.10	3.47	5.86	7.63
1968	9.36	9.58	10.5	11.5	11.1	6.23	2.49	2.67	7.78	3.74	1.09	5.29	6.76
1969	6.65	9.04	9.05	10.8	10.4	9.00	2.28	.94	.72	6.09	2.37	1.07	5.69
1970	10.1	8.05	7.71	8.52	9.49	11.3	8.38	5.03	1.77	1.02	1.19	6.08	6.53
1971	10.0	7.94	8.20	10.2	13.5	10.6	9.75	9.39	10.3	6.00	.76	7.07	8.60
1972	9.20	11.0	11.1	8.02	9.51	9.11	4.74	4.63	13.3	4.05	3.47	5.99	7.83
1973	9.29	9.21	6.98	9.36	11.1	9.41	8.37	4.84	.83	1.48	2.30	6.39	6.59
1974	8.11	7.22	8.65	10.0	11.9	7.51	8.01	2.99	.39	.26	.28	.60	5.46
1975	2.77	7.60	9.21	9.30	9.48	9.73	6.63	2.78	6.37	12.8	3.34	5.75	7.14
1976	1.88	5.92	7.16	9.98	10.3	10.1	7.10	4.29	2.62	4.73	7.51	3.53	6.26
1977	5.56	7.73	9.60	9.61	9.99	7.23	6.53	4.95	1.84	.52	4.55	5.43	6.10
1978	6.52	12.4	11.8	11.5	9.87	16.1	3.76	7.11	4.61	1.19	1.46	4.64	7.57
1979	7.36	9.18	12.5	12.2	11.6	11.5	7.04	1.50	.84	1.40	12.2	7.64	7.90
1980	7.74	11.0	8.77	10.4	11.3	10.8	7.94	1.14	.71	.31	.39	.58	5.90
1981	3.94	11.0	9.06	9.27	10.1	7.46	1.19	4.37	3.30	4.12	7.42	6.86	6.49
1982	5.85	9.14	11.2	9.79	10.8	10.8	6.02	7.40	12.1	7.12	7.96	8.56	8.88
1983	9.65	10.0	8.42	8.19	7.89	7.37	4.82	5.54	5.51	2.04	1.35	2.93	6.14
1984	5.56	9.09	8.91	11.1	9.50	8.63	9.30	9.69	10.3	10.3	4.82	7.62	8.73
1985	10.5	10.9	11.0	7.10	7.12	8.06	4.98	.81	.48	.67	5.48	9.69	6.39
1986	9.79	9.11	10.3	10.7	10.2	8.87	12.7	5.05	8.81	5.90	3.38	9.82	8.70
1987	9.94	10.0	8.89	8.32	9.35	10.8	10.5	7.91	10.2	4.73	4.29	7.55	8.53
1988	9.12	8.99	9.92	11.2	9.94	8.18	3.14	.98	.57	.29	2.76	6.29	5.94
1989	7.33	8.45	8.49	9.82	9.16	9.30	6.29	3.14	1.48	1.53	2.52	4.58	5.99
1990	4.78	7.71	7.91	9.30	8.89	8.68	7.73	1.88	8.12	2.22	3.21	1.23	5.94
1991	4.13	8.09	5.96	8.52	9.96	8.73	8.73	5.76	9.96	7.50	2.90	4.24	7.01
1992	9.43	7.58	8.63	8.34	8.23	8.37	10.3	1.74	7.97	7.27	4.19	7.99	7.49
1993	7.43	9.47	8.33	8.45	9.04	9.81	9.06	6.93	6.29	5.68	6.02	10.6	8.07

[1]Indicates a no-value month.

[2]Incomplete water year.

Table E8.2. Statistics on mean flow, in cubic feet per second, for station 06402500, Beaver Creek near Buffalo Gap (October 1938 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	55	55	55	55	55	55	55	55	55	55	55	55	55
Maximum	11.2	12.4	12.5	12.9	13.5	16.1	16.9	11.8	27.9	22.2	18.3	10.6	11.1
Percentile													
75th	9.36	10.0	10.9	10.9	10.7	9.86	8.38	6.58	9.96	6.58	4.29	7.27	7.90
50th	7.36	9.04	9.42	9.82	9.93	9.03	6.53	4.13	4.61	3.99	3.05	5.29	6.76
25th	4.78	7.60	8.42	8.52	9.14	8.23	2.87	1.76	1.48	1.02	1.35	2.42	5.93
Minimum	0.67	3.40	5.96	7.10	7.00	4.34	0.79	0.61	0.39	0.24	0.25	0.37	3.78
Mean	6.85	8.73	9.54	9.83	9.89	9.10	6.20	4.41	6.44	4.68	3.59	5.00	7.00
Standard deviation	2.86	2.04	1.54	1.35	1.28	1.64	3.69	3.03	6.14	4.50	3.34	2.91	1.46
Skewness	-0.56	-0.64	-0.09	0.06	0.14	0.99	0.48	0.73	1.57	1.53	2.23	0.01	0.47
Coefficient of variation	0.42	0.23	0.16	0.14	0.13	0.18	0.59	0.69	0.95	0.96	0.93	0.58	0.21
Percent of annual flow	8.13	10.36	11.33	11.67	11.73	10.80	7.35	5.23	7.65	5.55	4.26	5.93	[1]0.213

[1]Serial correlation for annual mean flows.

Table E8.3. Correlation matrix for monthly mean flow for station 06402500, Beaver Creek near Buffalo Gap (October 1938 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.617	-0.007	-0.251	-0.093	0.125	0.292	-0.036	0.122	0.072	-0.066	0.330
Nov.	*	1.000	.275	.049	.035	.376	.154	-.048	.118	.147	-.095	.181
Dec.	*	*	1.000	.633	.216	.141	-.178	-.211	.020	.026	.168	.067
Jan.	*	*	*	1.000	.593	.172	-.027	-.192	-.096	-.024	.059	-.154
Feb.	*	*	*	*	1.000	.265	.083	-.090	-.271	-.126	-.168	-.168
Mar.	*	*	*	*	*	1.000	.356	.256	.074	.085	.046	.074
Apr.	*	*	*	*	*	*	1.000	.412	.230	.256	.030	.230
May	*	*	*	*	*	*	*	1.000	.509	.307	.007	.313
June	*	*	*	*	*	*	*	*	1.000	.734	.123	.282
July	*	*	*	*	*	*	*	*	*	1.000	.194	.310
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.531
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E8.4. Serial correlation for 1-year lag for monthly mean flow for station 06402500, Beaver Creek near Buffalo Gap (October 1938 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.252	0.028	0.077	-0.013	0.178	-0.041	0.258	0.148	0.096	0.125	-0.001	0.144

Table E8.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06402500, Beaver Creek near Buffalo Gap

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1938	0.20	20	0.27	25	0.39	29	0.41	25	1.27	38	1.97	31	2.28	28	4.09	35	9.74	54
1939	.30	29	.43	42	.49	41	.51	31	.54	23	.78	15	1.03	14	1.20	9	1.84	8
1940	.40	39	.40	36	.41	34	.47	29	.61	24	.83	19	.83	10	1.43	11	2.53	13
1941	.30	30	.37	33	.41	35	.63	36	2.25	44	3.97	48	4.16	38	4.55	36	5.59	36
1942	1.20	53	1.47	53	2.27	55	4.21	55	5.80	55	7.37	55	7.99	54	8.54	54	9.27	53
1943	1.60	54	1.63	54	1.80	53	1.93	51	2.27	45	3.60	44	4.35	40	5.04	39	6.23	42
1944	.20	21	.20	16	.26	18	.28	13	.36	11	1.62	29	2.87	30	3.85	31	6.06	41
1945	.10	7	.17	12	.36	26	.76	41	2.54	47	3.89	47	4.35	41	4.62	37	5.58	35
1946	.10	8	.13	8	.24	16	.28	14	.62	25	2.27	35	3.76	35	4.62	38	4.93	32
1947	.40	40	.60	46	1.74	52	3.34	54	4.49	53	6.03	52	8.34	55	8.95	55	9.81	55
1948	.40	41	.40	37	.40	30	.65	37	1.19	37	2.82	40	3.78	36	3.85	32	4.13	27
1949	.10	9	.17	13	.21	12	.24	10	.39	12	.67	12	1.61	21	2.33	19	2.85	14
1950	.10	10	.20	17	.23	14	.32	16	.62	26	.76	13	1.48	19	2.02	17	3.94	25
1951	.40	42	.50	43	.61	43	.70	38	.73	28	.90	20	2.16	25	2.97	26	4.10	26
1952	.0000	1	.0000	1	.057	1	.093	1	.19	1	.46	8	.61	7	1.17	8	1.94	10
1953	.10	11	.10	6	.13	6	.20	5	.24	4	.57	9	.89	12	1.43	12	1.88	9
1954	.10	12	.10	7	.23	15	.34	19	.40	13	1.77	30	3.33	33	3.07	27	3.67	20
1955	.20	22	.20	18	.20	9	.24	9	.50	21	1.02	22	1.57	20	1.47	13	5.70	38
1956	.20	23	.23	22	.31	23	.36	21	.41	15	.44	7	.72	9	.94	6	1.29	5
1957	.10	13	.33	30	.56	42	.81	43	2.05	42	3.13	42	4.44	43	5.73	46	7.22	49
1958	.90	52	.97	52	1.29	50	1.90	50	3.20	51	4.21	49	5.09	48	5.86	47	6.43	43
1959	.20	24	.23	23	.27	19	.29	15	.32	9	.77	14	.97	13	1.55	14	1.61	6
1960	.20	25	.20	19	.20	10	.25	12	.29	8	.30	3	.34	2	.38	2	.50	1
1961	.0000	2	.067	3	.10	2	.16	4	.23	3	.27	2	.36	3	.68	5	.98	3
1962	.30	31	.33	31	.36	27	.41	24	.49	19	1.00	21	3.97	37	5.70	45	5.34	33
1963	1.70	55	1.73	55	2.01	54	2.34	53	3.12	50	3.70	45	5.06	47	6.53	51	7.79	50
1964	.10	14	.17	14	.20	11	.34	20	.49	18	.62	11	.68	8	1.06	7	1.82	7
1965	.30	32	.37	34	.41	36	.48	30	1.15	36	2.89	41	5.03	46	6.19	49	6.92	46
1966	.20	26	.27	26	.29	21	.36	22	.44	16	.60	10	2.20	27	3.42	29	4.40	28
1967	.68	50	.68	49	.69	46	.71	39	.78	30	2.02	33	4.48	44	6.01	48	5.65	37
1968	.62	48	.66	48	.80	47	.81	44	.85	31	1.99	32	3.21	32	3.84	30	3.82	22
1969	.40	43	.40	39	.41	37	.42	26	.45	17	.79	17	.88	11	2.43	20	2.25	11
1970	.36	38	.39	35	.41	33	.58	33	.89	32	1.09	23	1.32	18	1.40	10	3.87	23
1971	.42	46	.43	41	.44	39	.46	28	.74	29	2.53	36	4.38	42	5.54	43	6.74	45
1972	.75	51	.83	51	.94	48	1.41	48	2.64	48	2.80	38	4.29	39	5.46	42	6.00	40
1973	.40	44	.41	40	.43	38	.45	27	.54	22	.78	16	1.11	15	1.94	16	3.88	24
1974	.18	17	.21	21	.23	13	.24	8	.25	5	.26	1	.31	1	.36	1	1.06	4
1975	.18	18	.20	20	.33	25	.60	35	1.86	41	3.37	43	3.62	34	3.94	34	5.43	34
1976	.58	47	.59	45	.64	44	.71	40	1.51	40	2.02	34	2.78	29	3.87	33	4.62	31
1977	.11	15	.14	10	.18	7	.25	11	.40	14	1.11	24	1.29	17	2.49	22	3.67	21
1978	.30	33	.31	29	.38	28	.52	32	.92	33	1.23	26	2.19	26	2.65	24	3.50	17
1979	.050	4	.080	4	.12	5	.15	2	.62	27	.80	18	1.12	16	2.44	21	4.59	30
1980	.0000	3	.003	2	.11	4	.21	6	.28	7	.33	4	.41	4	.44	3	.83	2
1981	.31	36	.40	38	.47	40	.88	45	1.10	35	2.74	37	2.96	31	3.13	28	4.54	29
1982	.62	49	.65	47	1.13	49	1.24	47	3.09	49	6.65	54	7.63	53	7.95	52	8.18	51
1983	.27	28	.28	27	.29	22	.33	18	.98	34	1.28	27	1.96	23	2.90	25	3.64	18
1984	.30	34	.73	50	1.53	51	1.81	49	4.68	54	6.15	53	7.36	52	8.18	53	8.65	52
1985	.070	5	.080	5	.10	3	.15	3	.21	2	.35	6	.51	6	1.62	15	3.66	19
1986	.18	19	.19	15	.24	17	1.00	46	2.22	43	3.79	46	5.61	51	5.45	41	7.06	47
1987	.30	35	.36	32	.40	31	2.07	52	3.28	52	4.46	50	5.41	49	6.34	50	7.19	48
1988	.11	16	.14	9	.19	8	.22	7	.27	6	.35	5	.50	5	.62	4	2.32	12
1989	.23	27	.24	24	.27	20	.37	23	.50	20	1.22	25	1.80	22	2.02	18	2.96	15
1990	.31	37	.31	28	.32	24	.33	17	.36	10	1.50	28	2.15	24	2.60	23	3.43	16
1991	.080	6	.14	11	.41	32	.59	34	2.33	46	2.80	39	4.69	45	5.64	44	6.49	44
1992	.41	45	.55	44	.68	45	.79	42	1.45	39	4.79	51	5.45	50	5.27	40	5.93	39

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E8.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06402500, Beaver Creek near Buffalo Gap

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1939	14.0	38	13.0	34	11.9	41	11.3	43	11.0	38	10.5	38	10.0	39	10.0	29	9.71	23
1940	16.0	33	11.3	49	9.71	55	9.40	55	9.20	54	8.85	54	8.47	54	8.23	54	7.64	52
1941	126	8	55.3	8	34.6	4	23.1	4	17.2	6	13.6	5	12.9	4	12.9	4	12.3	3
1942	29.0	21	19.3	22	15.6	20	15.0	17	13.4	14	11.5	15	11.3	13	11.0	11	9.83	20
1943	57.0	14	42.0	13	27.0	12	22.7	5	20.6	3	16.1	3	16.2	2	15.6	2	12.8	2
1944	17.0	30	16.7	24	16.1	19	15.1	16	14.2	10	12.7	9	11.8	8	11.2	10	10.4	12
1945	16.0	34	12.7	36	12.3	33	12.1	30	11.7	25	11.3	19	11.1	14	10.5	22	9.86	19
1946	29.0	22	14.7	27	10.9	49	9.60	54	8.73	55	8.35	55	8.28	55	8.11	55	7.84	51
1947	242	2	136	1	78.6	1	51.9	1	37.8	1	25.4	1	19.5	1	16.6	1	13.1	1
1948	13.0	41	13.0	35	12.7	30	12.3	26	12.3	19	11.8	12	11.4	12	11.0	12	10.5	11
1949	13.0	42	12.7	37	11.9	42	10.9	48	9.90	51	9.22	52	9.00	53	8.73	53	8.67	43
1950	12.0	47	11.3	50	11.1	47	11.1	45	10.5	46	9.43	51	9.40	46	9.02	48	8.21	49
1951	20.0	28	12.3	41	11.3	46	11.0	46	11.0	39	10.8	33	10.4	30	10.3	23	9.51	28
1952	23.0	24	15.7	25	11.0	48	11.0	47	10.8	43	10.1	42	9.86	41	9.67	40	9.22	30
1953	11.0	52	11.0	51	10.7	50	10.4	49	10.2	47	10.1	43	9.28	50	8.97	50	7.41	54
1954	140	6	62.3	6	28.7	11	14.2	20	11.6	28	11.1	23	10.5	27	9.72	37	7.42	53
1955	313	1	125	2	60.7	2	34.2	3	19.6	4	13.5	6	10.6	24	10.3	24	8.84	39
1956	13.0	43	12.3	42	12.0	35	11.7	38	11.3	34	11.2	22	11.1	15	10.8	16	9.89	18
1957	78.0	12	45.0	11	29.6	9	20.8	7	17.4	5	13.8	4	11.8	9	11.0	13	10.3	14
1958	82.0	10	35.0	14	20.7	15	15.5	14	12.2	21	11.5	16	10.9	19	10.9	14	10.8	7
1959	23.0	25	12.0	45	11.9	43	11.5	40	11.2	35	10.9	30	10.5	28	10.1	27	8.98	36
1960	13.0	44	12.3	43	12.1	34	11.5	41	11.2	36	11.0	26	10.6	25	10.3	25	8.99	35
1961	14.0	39	12.2	44	12.0	36	12.0	31	11.7	26	10.7	34	10.1	36	9.07	47	6.61	55
1962	81.0	11	53.3	9	29.4	10	20.1	8	16.4	8	13.0	8	10.1	37	9.78	36	8.18	50
1963	199	3	119	3	60.3	3	41.4	2	26.3	2	19.1	2	14.9	3	13.2	3	11.7	4
1964	53.0	16	23.3	19	13.1	27	11.9	35	11.6	29	10.9	31	10.7	21	10.7	17	10.2	16
1965	44.0	18	29.0	16	19.0	17	13.9	21	11.8	23	11.7	13	11.6	10	11.4	8	10.3	15
1966	158	5	64.7	5	32.6	5	17.0	11	12.4	18	11.5	17	11.5	11	11.3	9	10.8	8
1967	39.0	19	26.7	17	19.6	16	16.3	13	14.4	9	11.1	24	11.0	17	10.9	15	9.57	26
1968	16.0	35	13.3	31	12.7	31	12.3	27	11.8	24	11.3	20	11.1	16	10.7	18	9.69	24
1969	55.0	15	24.9	18	15.2	22	12.0	32	11.4	32	10.7	35	10.3	33	10.2	26	9.13	32
1970	13.0	45	12.7	38	12.4	32	12.2	28	11.6	30	10.4	39	9.94	40	9.84	35	9.23	29
1971	49.0	17	32.3	15	21.4	14	16.5	12	14.0	12	12.5	10	12.0	7	11.6	7	10.6	9
1972	131	7	62.3	7	32.0	7	20.0	9	13.7	13	11.4	18	10.5	29	9.91	32	9.66	25
1973	12.0	48	12.0	46	12.0	37	11.8	37	11.0	40	10.7	36	10.1	38	9.63	41	9.19	31
1974	12.0	49	12.0	47	12.0	38	12.0	33	12.0	22	11.3	21	10.7	22	9.70	38	8.98	37
1975	170	4	64.8	4	32.4	6	19.0	10	14.1	11	9.98	44	9.69	44	9.62	42	8.70	41
1976	100	9	42.7	12	21.9	13	15.4	15	11.0	41	10.7	37	10.2	34	9.43	43	8.70	42
1977	12.0	50	10.7	52	10.3	51	10.1	50	10.0	49	9.97	45	9.76	43	9.69	39	8.66	44
1978	61.0	13	47.7	10	30.6	8	21.6	6	16.5	7	13.2	7	12.7	5	12.4	5	11.6	5
1979	21.0	27	15.3	26	14.9	24	13.9	22	12.6	16	12.4	11	12.1	6	12.0	6	11.3	6
1980	14.0	40	13.3	32	13.1	28	12.8	24	11.7	27	11.1	25	11.0	18	10.6	21	10.6	10
1981	13.0	46	12.7	39	12.0	39	11.9	36	11.4	33	10.2	41	9.84	42	9.87	34	8.48	47
1982	16.0	36	14.0	30	13.6	26	12.9	23	12.3	20	11.7	14	10.6	26	10.7	19	9.98	17
1983	11.0	53	10.7	53	10.3	52	10.1	51	10.0	50	9.91	46	9.40	47	9.09	46	8.59	45
1984	17.0	31	13.3	33	11.7	44	11.4	42	11.2	37	10.3	40	10.2	35	9.92	31	9.78	21
1985	12.0	51	12.0	48	11.4	45	11.2	44	11.0	42	11.0	27	10.8	20	9.94	30	9.12	33
1986	22.0	26	17.7	23	15.6	21	14.3	19	13.1	15	10.9	32	10.7	23	10.7	20	10.4	13
1987	30.0	20	22.3	20	18.9	18	14.9	18	12.5	17	11.0	28	10.4	31	9.88	33	9.74	22
1988	17.0	32	14.7	28	13.1	29	12.0	34	11.6	31	11.0	29	10.4	32	10.1	28	9.56	27
1989	11.0	54	10.3	55	10.1	54	10.1	52	9.81	52	9.50	48	9.44	45	9.20	45	8.90	38
1990	11.0	55	10.7	54	10.3	53	10.1	53	9.41	53	9.18	53	9.03	52	8.77	52	8.35	48
1991	27.0	23	21.0	21	15.2	23	12.2	29	10.1	48	9.83	47	9.35	48	9.01	49	8.81	40
1992	15.0	37	14.3	29	14.0	25	12.8	25	10.6	44	9.49	49	9.09	51	8.91	51	8.59	46
1993	20.0	29	12.7	40	12.0	40	11.7	39	10.6	45	9.48	50	9.34	49	9.24	44	9.10	34

Table E9.1. Mean flow, in cubic feet per second, for station 06402600, Cheyenne River near Buffalo Gap

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1969	66.8	67.5	55.6	45.5	62.0	88.0	66.5	51.6	52.8	866	61.4	76.3	131
1970	75.4	64.4	77.4	71.6	77.8	65.5	77.8	60.3	58.3	51.5	64.2	75.9	68.2
1971	83.7	62.6	52.6	52.9	81.9	70.4	74.5	1,403	1,069	51.6	56.3	91.1	263
1972	76.8	72.9	73.5	55.0	59.2	57.5	58.6	68.9	131	56.5	78.1	76.7	72.0
1973	67.0	70.5	67.6	65.3	69.1	71.5	74.0	171	50.9	62.7	50.3	95.4	76.4
1974	73.6	84.1	40.2	98.3	235	135	190	59.3	44.3	36.9	57.6	60.3	91.8
1975	63.1	69.5	59.2	61.6	60.5	67.4	53.8	60.5	62.8	48.8	45.2	58.5	59.2
1976	63.7	63.9	62.5	44.1	58.1	59.5	64.2	58.8	49.1	32.6	66.3	55.6	56.5
1977	67.0	64.1	69.5	61.3	64.9	59.0	61.5	51.6	32.3	70.1	43.9	68.5	59.5
1978	75.2	70.9	34.7	39.7	54.9	109	45.6	1,909	198	140	147	61.0	243
1979	68.5	77.6	73.7	56.8	63.7	263	181	59.6	58.7	63.2	71.5	60.6	91.7
1980	68.5	73.6	71.9	62.6	135	162	102	50.6	56.1	20.7	49.2	64.1	76.0

Table E9.2. Statistics on mean flow, in cubic feet per second, for station 06402600, Cheyenne River near Buffalo Gap (October 1968 through September 1980)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	12	12	12	12	12	12	12	12	12	12	12	12	12
Maximum	83.7	84.1	77.4	98.3	235	263	190	1,909	1,069	866	147	95.4	263
Percentile													
75th	75.3	73.4	73.1	64.6	80.9	128	95.9	145	114	68.4	70.2	76.6	121
50th	68.5	70.0	65.1	59.1	64.3	70.9	70.2	59.9	57.2	54.0	59.5	66.3	76.2
25th	66.8	64.2	53.3	47.3	59.5	61.0	59.3	53.4	49.5	39.9	49.5	60.4	61.7
Minimum	63.1	62.6	34.7	39.7	54.9	57.5	45.6	50.6	32.3	20.7	43.9	55.6	56.5
Mean	70.77	70.13	61.53	59.56	85.17	100.65	87.46	333.68	155.27	125.05	65.92	70.33	107.36
Standard deviation	6.15	6.35	13.64	15.37	51.87	61.00	47.95	627.86	291.47	235.20	27.60	12.96	71.09
Skewness	0.74	0.90	-0.89	1.36	2.64	2.02	1.70	2.18	3.32	3.37	2.62	0.88	1.75
Coefficient of variation	0.09	0.09	0.22	0.26	0.61	0.61	0.55	1.88	1.88	1.88	0.42	0.18	0.66
Percent of annual flow	5.51	5.46	4.79	4.63	6.63	7.83	6.80	25.96	12.08	9.73	5.13	5.47	[1]-0.244

[1]Serial correlation for annual mean flows.

Table E9.3. Serial correlation for 1-year lag for monthly mean flow for station 06402600, Cheyenne River near Buffalo Gap (October 1968 through September 1980)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.304	0.240	-0.382	0.005	-0.139	0.414	-0.152	-0.233	-0.059	-0.049	-0.174	0.377

Table E9.4. Correlation matrix for monthly mean flow for station 06402600, Cheyenne River near Buffalo Gap (October 1968 through September 1980)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	-0.020	-0.237	0.081	0.172	-0.079	0.039	0.595	0.723	-0.174	0.331	0.437
Nov.	*	1.000	-.228	.566	.673	.651	.775	-.196	-.358	-.139	.101	-.341
Dec.	*	*	1.000	.006	-.336	.050	-.037	-.647	-.271	-.193	-.506	.193
Jan.	*	*	*	1.000	.825	.134	.636	-.424	-.208	-.340	-.455	-.016
Feb.	*	*	*	*	1.000	.272	.691	-.175	-.065	-.191	-.230	-.191
Mar.	*	*	*	*	*	1.000	.778	-.069	-.161	-.067	.119	-.369
Apr.	*	*	*	*	*	*	1.000	-.291	-.140	-.176	-.180	-.266
May	*	*	*	*	*	*	*	1.000	.644	-.051	.712	.151
June	*	*	*	*	*	*	*	*	1.000	-.103	.037	.486
July	*	*	*	*	*	*	*	*	*	1.000	.052	.145
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	-.227
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E9.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06402600, Cheyenne River near Buffalo Gap

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1969	32.0	10	33.0	10	35.3	8	37.0	6	44.5	9	49.5	6	51.9	5	69.4	11	71.0	11
1970	21.0	4	26.0	6	30.7	6	38.6	9	42.0	6	52.1	7	53.1	6	57.7	5	63.9	6
1971	21.0	5	21.3	4	23.9	4	32.6	5	45.0	10	53.1	8	57.2	8	61.2	7	65.8	7
1972	26.0	7	26.7	7	33.6	7	39.6	10	54.3	11	63.7	11	65.5	11	66.8	9	67.6	10
1973	15.0	3	17.3	3	20.0	3	20.5	3	26.3	1	45.4	4	54.4	7	62.4	8	65.9	8
1974	25.0	6	25.7	5	26.9	5	30.2	4	33.9	4	40.4	3	45.4	3	49.1	2	53.1	1
1975	30.0	8	31.7	9	36.1	10	38.3	8	42.1	7	46.3	5	50.0	4	52.1	4	54.7	4
1976	13.0	2	14.0	2	15.4	2	20.1	2	28.2	2	38.7	2	45.1	2	50.1	3	54.4	3
1977	10.0	1	10.7	1	13.7	1	19.9	1	30.2	3	35.5	1	42.4	1	48.7	1	54.3	2
1978	30.0	9	30.7	8	36.4	11	39.7	11	43.8	8	59.2	10	64.7	10	67.9	10	66.8	9
1979	33.0	11	33.3	11	36.0	9	37.4	7	40.1	5	55.5	9	58.1	9	60.8	6	63.1	5

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E9.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06402600, Cheyenne River near Buffalo Gap

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1969	5,980	3	4,143	3	2,986	3	1,730	3	895	3	483	3	344	3	271	3	201	3
1970	285	10	212	10	144	10	110	10	80.8	9	78.1	9	75.7	9	73.7	9	72.5	9
1971	12,500	2	8,860	2	5,097	2	3,991	1	2,302	1	1,261	1	865	1	665	1	460	1
1972	939	4	394	8	215	8	176	8	135	8	101	8	90.8	8	85.7	8	78.1	8
1973	895	5	691	4	484	5	283	6	181	7	126	7	109	7	98.1	7	87.1	7
1974	722	7	603	5	483	6	376	5	304	5	211	5	190	4	167	4	128	4
1975	249	12	161	12	113	12	83.3	12	72.5	11	66.5	11	64.6	11	63.5	11	63.7	11
1976	280	11	198	11	132	11	93.7	11	70.0	12	65.4	12	63.5	12	60.2	12	59.0	12
1977	880	6	377	9	205	9	118	9	76.5	10	67.2	10	67.0	10	65.6	10	64.4	10
1978	20,600	1	12,810	1	6,443	1	3,510	2	2,052	2	1,085	2	795	2	616	2	430	2
1979	600	9	533	7	514	4	424	4	326	4	227	4	174	5	146	5	120	5
1980	616	8	576	6	381	7	263	7	213	6	167	6	133	6	116	6	101	6

Table E10.1. Mean flow, in cubic feet per second, for station 06403300, French Creek above Fairburn

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1982	(1)	(1)	(1)	(1)	(1)	(1)	2.25	19.1	53.3	20.1	8.04	16.8	(2)
1983	12.6	8.63	2.06	1.84	4.08	8.40	10.2	16.6	13.5	3.38	3.04	6.21	7.55
1984	4.64	1.87	1.49	1.41	2.19	5.47	9.81	23.3	32.1	24.2	10.7	3.77	10.1
1985	5.97	6.72	2.22	3.90	1.71	5.54	7.42	4.34	1.46	.44	.53	2.05	3.53
1986	1.42	1.07	1.16	1.30	1.21	5.43	8.14	7.72	8.73	5.79	1.74	3.85	3.97
1987	9.67	5.30	2.93	1.94	1.99	24.8	11.4	11.8	10.6	2.27	.56	.65	7.03
1988	.84	1.07	.96	.66	.32	1.59	2.31	3.44	2.00	20.1	1.69	1.17	3.04
1989	1.33	1.56	.79	.39	.19	2.32	1.63	1.00	.46	.50	.63	1.32	1.01
1990	1.76	1.21	.69	.68	.93	2.30	2.15	20.7	18.7	4.69	3.65	1.54	4.94
1991	.98	1.72	1.02	.41	1.19	4.69	10.5	54.8	64.8	10.1	11.4	2.76	13.7
1992	3.55	3.20	2.31	1.36	2.67	9.93	5.41	3.74	7.80	9.00	4.09	1.59	4.57
1993	1.75	1.94	.91	.94	.95	8.43	12.0	23.9	50.9	22.9	12.2	7.36	12.0

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E10.2. Statistics on mean flow, in cubic feet per second, for station 06403300, French Creek above Fairburn (October 1982 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	11	11	11	11	11	11	11	11	11	11	11	11	11
Maximum	12.6	8.63	2.93	3.90	4.08	24.8	12.0	54.8	64.8	24.2	12.2	7.36	13.7
Percentile													
75th	5.97	5.30	2.22	1.84	2.19	8.43	10.5	23.3	32.1	20.1	10.7	3.85	10.1
50th	1.76	1.87	1.16	1.30	1.21	5.47	8.14	11.8	10.6	5.79	3.04	2.05	4.94
25th	1.33	1.21	0.91	0.66	0.93	2.32	2.31	3.74	2.00	2.27	0.63	1.32	3.53
Minimum	0.84	1.07	0.69	0.39	0.19	1.59	1.63	1.00	0.46	0.44	0.53	0.65	1.01
Mean	4.05	3.12	1.50	1.35	1.58	7.17	7.36	15.58	19.19	9.40	4.57	2.93	6.49
Standard deviation	3.92	2.60	0.75	1.00	1.12	6.44	3.89	15.48	21.35	8.93	4.58	2.18	4.00
Skewness	1.40	1.33	0.73	1.78	1.01	2.32	-0.48	1.75	1.36	0.82	0.96	1.14	0.63
Coefficient of variation	0.97	0.83	0.50	0.74	0.71	0.90	0.53	0.99	1.11	0.95	1.00	0.74	0.62
Percent of annual flow	5.20	4.01	1.93	1.73	2.04	9.22	9.46	20.02	24.66	12.08	5.87	3.77	[1]-0.080

[1]Serial correlation for annual mean flows.

Table E10.3. Serial correlation for 1-year lag for monthly mean flow for station 06403300, French Creek above Fairburn (October 1982 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.049	-0.389	-0.189	0.160	0.340	-0.161	0.117	-0.074	-0.110	-0.437	0.018	0.043

Table E10.4. Correlation matrix for monthly mean flow for station 06403300, French Creek above Fairburn (October 1982 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.915	0.780	0.581	0.833	0.617	0.464	-0.125	-0.234	-0.351	-0.270	0.186
Nov.	*	1.000	.751	.739	.771	.452	.388	-.160	-.262	-0.466	-.322	.189
Dec.	*	*	1.000	.699	.689	.792	.420	-.265	-.321	-.345	-.338	-.169
Jan.	*	*	*	1.000	.457	.318	.299	-.329	-.363	-.345	-.351	.002
Feb.	*	*	*	*	1.000	.412	.489	.034	-.044	-.160	.010	.348
Mar.	*	*	*	*	*	1.000	.571	-.053	-.035	-.203	-.137	-.079
Apr.	*	*	*	*	*	*	1.000	.502	.578	.213	.514	.600
May	*	*	*	*	*	*	*	1.000	.930	.278	.780	.311
June	*	*	*	*	*	*	*	*	1.000	.489	.926	.488
July	*	*	*	*	*	*	*	*	*	1.000	.712	.390
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.563
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E10.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06403300, French Creek above Fairburn

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1982	1.30	11	1.33	11	1.39	11	1.46	11	1.68	10	1.89	9	2.38	10	3.55	11	6.37	11
1983	.90	9	.97	9	1.03	9	1.13	9	1.35	8	1.43	7	1.57	7	1.68	7	2.86	8
1984	.70	8	.79	7	.91	8	1.07	7	1.73	11	2.71	11	2.62	11	3.08	10	4.03	9
1985	.25	4	.26	4	.30	5	.37	5	.43	5	.47	3	.57	3	.98	4	1.05	4
1986	.50	6	.83	8	.86	7	1.08	8	1.67	9	1.97	10	2.17	9	2.92	9	4.22	10
1987	.15	3	.18	3	.26	3	.29	3	.32	3	.48	4	.61	4	.72	3	.75	1
1988	.020	1	.020	1	.030	1	.081	1	.15	1	.24	1	.39	1	.63	2	.85	2
1989	.12	2	.13	2	.15	2	.20	2	.31	2	.43	2	.46	2	.62	1	.89	3
1990	.28	5	.29	5	.29	4	.30	4	.36	4	.53	5	.85	5	1.02	5	1.13	5
1991	1.10	10	1.17	10	1.24	10	1.29	10	1.34	7	1.45	8	1.95	8	2.30	8	2.58	7
1992	.52	7	.57	6	.65	6	.71	6	.83	6	.92	6	.93	6	1.04	6	1.29	6

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E10.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06403300, French Creek above Fairburn

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1983	33.0	8	28.7	8	23.7	7	21.1	7	16.9	7	15.2	6	13.5	6	12.3	5	9.50	5
1984	109	5	75.0	5	62.9	4	48.5	3	32.8	3	29.2	3	27.1	3	23.3	3	17.7	3
1985	15.0	10	11.7	10	9.50	10	8.39	10	7.72	10	7.06	10	5.83	10	4.93	10	4.65	10
1986	37.0	7	31.7	7	22.3	8	14.0	8	11.7	8	9.65	8	9.03	7	8.00	7	6.30	8
1987	198	3	123	3	62.1	5	41.3	5	26.6	5	18.7	5	17.1	4	14.9	4	10.6	4
1988	52.0	6	51.7	6	50.7	6	37.7	6	21.4	6	11.8	7	8.77	8	7.18	8	5.30	9
1989	8.00	11	4.50	11	3.91	11	2.97	11	2.79	11	2.10	11	1.70	11	1.38	11	1.23	11
1990	110	4	97.3	4	68.1	3	42.2	4	30.5	4	20.0	4	15.0	5	12.2	6	8.72	6
1991	252	1	195	1	142	1	136	1	97.3	1	61.1	1	45.2	1	36.9	1	26.1	1
1992	24.0	9	19.7	9	15.9	9	12.2	9	10.0	9	8.54	9	7.30	9	6.73	9	6.73	7
1993	211	2	175	2	108	2	75.7	2	51.9	2	38.0	2	32.7	2	27.8	2	22.2	2

Table E11.1. Mean flow, in cubic feet per second, for station 06404000, Battle Creek near Keystone

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.68	4.59	1.07	(2)
1946	1.12	1.09	.93	.65	1.15	3.44	2.50	54.4	49.2	46.3	4.85	10.8	14.8
1947	12.3	8.93	4.42	3.24	2.11	3.56	8.57	13.5	64.2	52.6	(1)	(1)	(2)
1962	.000	.060	.026	.000	.021	.46	2.17	36.6	65.0	46.3	14.7	3.59	14.2
1963	5.20	3.09	2.11	1.25	2.11	7.11	19.4	22.9	85.5	21.3	3.90	6.11	15.0
1964	2.93	3.00	2.24	1.94	3.03	2.57	5.82	12.5	29.1	25.7	4.16	1.81	7.90
1965	1.25	1.32	1.32	1.29	1.01	1.13	4.64	67.6	91.1	44.3	13.0	4.87	19.5
1966	4.70	3.56	3.13	1.88	1.40	4.39	11.3	6.20	1.93	1.35	2.90	2.64	3.79
1967	4.14	2.55	1.64	1.76	1.73	2.54	4.22	9.37	131	19.1	4.02	2.74	15.3
1968	2.12	2.50	1.85	2.07	2.42	3.40	3.14	2.93	16.5	5.84	3.26	2.26	4.01
1969	1.10	1.34	1.34	1.05	.74	1.35	4.38	3.06	7.83	41.9	4.25	.56	5.80
1970	1.48	1.72	.93	.16	.33	1.03	9.78	17.8	40.9	3.35	3.36	1.37	6.83
1971	2.18	1.20	.63	.83	1.19	3.46	38.8	71.2	59.8	6.77	1.64	1.46	15.8
1972	2.25	2.18	1.68	.66	.66	3.54	4.93	13.4	199	15.8	7.61	3.78	21.1
1973	2.73	2.89	1.65	1.64	1.20	4.83	37.6	24.5	13.4	5.89	4.80	2.13	8.61
1974	1.89	2.47	1.04	.87	1.20	2.62	3.61	3.05	1.74	1.08	.10	.11	1.65
1975	.32	.86	.13	.000	.37	1.44	13.0	10.5	21.1	5.21	2.14	.000	4.58
1976	.074	.45	1.48	1.35	1.85	1.77	5.24	49.8	72.3	13.9	7.95	1.94	13.2
1977	1.84	1.53	1.54	.72	1.43	3.58	11.6	3.91	1.61	1.43	2.84	1.40	2.78
1978	1.89	1.77	1.47	.69	.96	4.25	5.20	89.8	25.4	5.45	3.07	.86	11.9
1979	.95	1.21	1.02	.53	.80	2.50	5.05	2.78	4.72	33.0	15.6	3.08	6.00
1980	1.40	2.77	2.01	.43	.96	3.29	7.49	5.19	3.87	1.28	.97	.15	2.48
1981	1.85	1.32	2.28	.95	.65	1.44	1.49	44.7	6.16	4.02	3.43	.25	5.79
1982	1.38	1.05	.76	.50	1.38	2.96	3.68	20.1	31.9	8.50	2.48	1.84	6.38
1983	4.85	2.64	1.83	1.27	1.45	2.65	5.57	16.9	8.20	1.78	.39	.000	3.98
1984	.75	1.32	1.15	1.80	1.73	1.96	5.19	22.7	51.4	12.9	2.68	.46	8.65
1985	1.46	1.22	.69	.75	.041	3.78	3.71	1.24	.22	.069	.008	.036	1.11
1986	.25	.48	.63	1.46	1.67	3.03	11.6	16.6	14.6	4.51	1.05	4.70	5.05
1987	12.7	5.24	4.25	2.64	2.91	12.8	12.7	18.1	8.50	1.77	.088	.000	6.84
1988	.21	.75	.42	.12	.28	1.47	1.90	2.25	.65	.22	.033	.000	.69
1989	.000	.000	.000	.000	.000	1.95	1.77	1.64	.64	.039	.000	6.20	1.02
1990	2.57	1.82	1.14	.69	1.51	3.83	6.46	33.4	23.7	17.0	5.45	1.45	8.32
1991	1.04	1.68	.98	.62	1.55	2.65	9.22	73.6	92.8	10.3	3.92	1.60	16.7
1992	2.16	2.47	1.78	2.17	2.72	4.90	3.37	2.71	6.20	9.86	2.95	.66	3.50
1993	.59	1.61	1.66	1.45	1.05	4.75	12.3	58.0	68.0	17.3	10.1	4.16	15.1

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E11.2. Statistics on mean flow, in cubic feet per second, for station 06404000, Battle Creek near Keystone (October 1961 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	32	32	32	32	32	32	32	32	32	32	32	32	32
Maximum	12.7	5.24	4.25	2.64	3.03	12.8	38.8	89.8	199	46.3	15.6	6.20	21.1
Percentile													
75th	2.49	2.54	1.82	1.60	1.71	3.82	11.5	35.8	63.7	17.2	4.66	2.99	14.0
50th	1.66	1.64	1.40	0.91	1.20	2.80	5.22	16.7	18.8	6.33	3.16	1.53	6.60
25th	0.80	1.20	0.80	0.55	0.68	1.81	3.69	3.27	5.08	1.77	1.20	0.30	3.84
Minimum	0.000	0.000	0.000	0.000	0.000	0.46	1.49	1.24	0.22	0.039	0.000	0.000	0.69
Mean	2.13	1.81	1.40	1.05	1.26	3.23	8.64	23.91	37.02	12.10	4.15	1.94	8.24
Standard deviation	2.38	1.10	0.87	0.70	0.80	2.24	8.79	24.79	45.29	13.26	4.12	1.81	5.76
Skewness	3.06	0.86	1.05	0.32	0.46	2.68	2.57	1.26	1.89	1.44	1.56	0.91	0.66
Coefficient of variation	1.11	0.61	0.62	0.67	0.64	0.69	1.02	1.04	1.22	1.10	0.99	0.93	0.70
Percent of annual flow	2.16	1.84	1.42	1.06	1.28	3.28	8.75	24.23	37.53	12.27	4.21	1.97	[1]0.030

[1]Serial correlation for annual mean flows.

Table E11.3. Serial correlation for 1-year lag for monthly mean flow for station 06404000, Battle Creek near Keystone (October 1961 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.211	-0.162	-0.119	0.175	-0.012	-0.167	-0.145	-0.271	-0.055	0.058	-0.014	-0.011

Table E11.4. Correlation matrix for monthly mean flow for station 06404000, Battle Creek near Keystone (October 1961 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.863	0.809	0.590	0.550	0.840	0.211	-0.103	-0.024	-0.175	-0.263	-0.145
Nov.	*	1.000	.874	.660	.628	.749	.223	-.176	-.027	-.204	-.257	-.209
Dec.	*	*	1.000	.739	.638	.704	.083	-.047	-.027	-.126	-.118	-.148
Jan.	*	*	*	1.000	.828	.559	.141	-.053	.002	-.006	-.095	-.025
Feb.	*	*	*	*	1.000	.547	.112	-.021	.017	-.032	-.151	-.049
Mar.	*	*	*	*	*	1.000	.335	-.023	-.068	-.271	-.248	-.017
Apr.	*	*	*	*	*	*	1.000	.257	.039	-.159	-.096	.086
May	*	*	*	*	*	*	*	1.000	.350	.192	.305	.117
June	*	*	*	*	*	*	*	*	1.000	.378	.405	.427
July	*	*	*	*	*	*	*	*	*	1.000	.802	.382
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.448
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E11.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06404000, Battle Creek near Keystone

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1962	0.50	25	0.53	24	0.63	24	0.84	24	1.23	27	1.57	26	1.74	26	1.99	27	2.76	29
1963	1.00	29	1.00	29	1.16	30	1.55	31	1.91	31	2.05	31	2.30	30	2.39	29	2.60	28
1964	.40	23	.53	25	.66	25	.80	23	.92	22	.94	22	1.10	22	1.13	17	1.20	15
1965	1.00	30	1.10	30	1.10	29	1.18	29	1.24	28	1.59	27	2.01	27	2.41	30	3.15	30
1966	.30	21	.37	22	.59	23	.87	25	1.20	26	1.33	24	1.64	25	1.80	25	2.40	27
1967	1.00	31	1.27	31	1.31	31	1.51	30	1.62	30	1.90	30	2.05	28	2.12	28	2.26	25
1968	.35	22	.35	21	.38	20	.39	18	.44	16	.74	18	.89	14	1.02	13	1.12	11
1969	.0000	1	.0000	1	.007	12	.011	12	.13	11	.23	8	.39	8	.60	8	.85	8
1970	.0000	2	.0000	2	.11	13	.18	13	.30	13	.65	16	.74	12	.85	11	1.13	12
1971	.10	14	.10	14	.16	14	.20	14	.26	12	.64	15	.98	18	1.26	19	1.47	18
1972	.80	27	.80	27	.89	27	1.03	27	1.16	25	1.41	25	1.50	23	1.74	24	2.16	24
1973	.0000	3	.0000	3	.0000	1	.0000	1	.46	17	.86	21	1.03	20	1.39	21	1.58	20
1974	.0000	4	.0000	4	.0000	2	.0000	2	.0000	1	.028	5	.077	4	.31	4	.24	3
1975	.0000	5	.0000	5	.0000	3	.0000	3	.0000	2	.019	4	.15	6	.39	6	.75	5
1976	.42	24	.50	23	.57	22	.60	22	.63	20	.86	20	1.09	21	1.26	20	1.50	19
1977	.20	16	.27	19	.38	21	.38	17	.64	21	.79	19	.96	16	1.18	18	1.36	17
1978	.20	17	.24	16	.36	18	.45	21	.53	19	.62	13	.78	13	.89	12	.90	10
1979	.29	20	.32	20	.37	19	.41	20	.43	15	.52	11	1.02	19	1.50	22	1.66	21
1980	.0000	6	.0000	6	.0000	4	.0000	4	.010	8	.47	10	.70	10	1.05	14	1.19	14
1981	.0000	7	.0000	7	.0000	5	.0000	5	.13	10	.57	12	.72	11	.82	10	.89	9
1982	.70	26	.72	26	.78	26	.88	26	1.01	23	1.28	23	1.51	24	1.73	23	2.31	26
1983	.0000	8	.0000	8	.0000	6	.0000	6	.0000	3	.093	7	.34	7	.53	7	.83	7
1984	.0000	9	.0000	9	.0000	7	.0000	7	.047	9	.36	9	.49	9	.63	9	.78	6
1985	.0000	10	.0000	10	.0000	8	.0000	8	.0000	4	.018	3	.036	2	.038	2	.18	2
1986	.11	15	.15	15	.25	15	.39	19	1.03	24	1.87	29	3.20	31	3.72	31	5.10	31
1987	.0000	11	.0000	11	.0000	9	.0000	9	.0000	5	.030	6	.059	3	.21	3	.26	4
1988	.0000	12	.0000	12	.0000	10	.0000	10	.0000	6	.0000	1	.0000	1	.0000	1	.0000	1
1989	.0000	13	.0000	13	.0000	11	.0000	11	.0000	7	.008	2	.13	5	.37	5	1.70	22
1990	.23	18	.25	18	.30	17	.35	16	.48	18	.70	17	.98	17	1.09	15	1.21	16
1991	.83	28	.90	28	.99	28	1.09	28	1.60	29	1.75	28	2.05	29	1.98	26	2.07	23
1992	.23	19	.24	17	.26	16	.29	15	.36	14	.62	14	.94	15	1.11	16	1.17	13

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E11.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06404000, Battle Creek near Keystone

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1962	230	14	192	13	146	10	98.0	9	77.9	9	65.2	6	53.6	5	41.7	5	28.1	7
1963	300	11	217	10	164	8	115	7	85.9	8	56.7	10	47.6	8	38.0	8	27.0	8
1964	131	18	83.0	18	56.1	18	42.3	17	36.9	17	27.7	16	22.7	15	18.6	14	13.3	14
1965	402	4	267	7	176	6	139	4	104	4	85.8	2	70.3	2	55.1	2	37.6	2
1966	25.0	27	20.3	27	19.4	26	15.9	25	12.9	25	9.17	25	7.42	25	6.04	25	4.74	26
1967	380	5	311	3	286	2	193	2	132	3	76.8	5	53.5	6	41.5	6	28.2	6
1968	90.0	20	65.0	20	39.3	21	24.3	23	17.5	23	11.4	24	8.78	24	7.25	24	5.84	24
1969	236	13	158	14	121	14	81.7	13	44.2	16	26.4	17	18.6	19	14.8	18	10.6	18
1970	380	6	234	9	128	11	69.9	16	45.3	15	31.2	13	23.1	14	18.3	15	12.7	15
1971	340	9	252	8	178	5	120	5	95.3	5	79.6	4	57.6	4	45.1	4	30.3	4
1972	2,400	1	1,417	1	667	1	375	1	203	1	108	1	76.6	1	59.3	1	40.4	1
1973	284	12	200	11	112	16	73.5	14	50.7	12	33.9	12	25.6	12	20.5	13	15.2	12
1974	6.50	32	6.17	31	4.66	31	4.12	31	3.63	31	3.34	30	3.17	29	2.86	29	2.23	29
1975	93.0	19	68.7	19	50.6	19	34.9	20	21.8	20	15.9	21	15.5	20	12.6	21	8.91	21
1976	617	2	352	2	203	4	118	6	93.6	6	61.4	8	46.3	9	36.9	9	25.2	9
1977	22.0	28	21.0	26	17.4	27	15.5	26	11.6	26	8.16	27	6.39	27	5.30	27	4.16	27
1978	144	17	122	16	114	15	96.5	10	90.0	7	59.9	9	41.9	10	32.4	10	22.4	10
1979	179	16	92.3	17	65.7	17	42.3	18	36.9	18	25.0	19	18.7	18	14.6	19	10.9	17
1980	14.0	29	10.3	29	10.0	29	9.07	29	7.61	28	6.48	28	5.64	28	5.04	28	3.75	28
1981	364	7	284	5	156	9	85.4	11	47.8	14	26.2	18	18.9	17	15.0	17	10.3	19
1982	66.0	22	65.0	21	46.7	20	38.1	19	34.1	19	28.2	15	20.5	16	16.2	16	11.6	16
1983	56.0	24	43.7	24	32.4	24	24.4	22	17.2	24	12.8	23	10.4	23	8.53	23	6.12	23
1984	204	15	156	15	126	12	84.8	12	51.7	11	37.5	11	29.3	11	23.4	11	16.1	11
1985	11.0	30	9.07	30	7.26	30	6.71	30	5.55	30	3.98	29	2.96	30	2.29	30	1.74	30
1986	70.0	21	50.7	22	34.9	22	24.3	24	20.5	21	17.3	20	14.6	22	12.0	22	8.82	22
1987	53.0	25	44.7	23	34.6	23	24.7	21	18.4	22	15.6	22	15.2	21	13.2	20	9.65	20
1988	7.00	31	5.80	32	4.17	32	3.26	32	2.53	32	2.27	32	1.92	32	1.60	32	1.14	32
1989	64.0	23	37.7	25	21.1	25	11.5	28	6.20	29	3.10	31	2.07	31	1.70	31	1.70	31
1990	313	10	194	12	121	13	73.5	15	48.1	13	30.2	14	25.1	13	21.1	12	15.1	13
1991	348	8	306	4	223	3	173	3	137	2	84.3	3	60.9	3	47.4	3	32.1	3
1992	27.0	26	19.0	28	13.2	28	12.6	27	11.1	27	8.34	26	6.59	26	5.70	26	5.11	25
1993	521	3	280	6	170	7	107	8	72.1	10	63.7	7	48.3	7	39.7	7	28.6	5

Table E12.1. Mean flow, in cubic feet per second, for station 06404998, Grace Coolidge Creek near Game Lodge, near Custer

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1977	1.27	1.02	1.50	.97	.69	.87	2.00	.67	.60	1.38	2.76	1.43	1.27
1978	1.46	1.38	1.00	.98	.95	1.06	2.27	40.4	9.53	3.61	2.73	.93	5.58
1979	1.15	1.19	.81	.95	1.28	1.60	2.01	1.06	1.55	22.3	11.9	5.58	4.33
1980	3.44	1.11	.95	.56	.59	.84	1.68	1.39	1.71	.78	.58	.44	1.17
1981	.78	.88	1.05	.95	.77	.61	.63	26.5	4.84	3.01	3.79	1.50	3.82
1982	1.67	1.48	1.23	.93	.94	1.26	1.66	6.89	21.2	6.59	2.49	3.27	4.13
1983	4.13	2.36	1.69	1.18	1.04	1.35	2.91	7.69	4.35	1.83	.81	.28	2.48
1984	.98	1.10	.72	.82	.71	.68	2.22	13.7	14.4	9.10	3.48	1.51	4.13
1985	1.62	1.55	.98	.93	.62	.67	1.33	.76	.28	.24	.26	.50	.81
1986	.55	.41	.32	.61	.71	.81	2.90	4.89	5.87	3.40	1.49	2.49	2.04
1987	5.92	3.33	2.26	1.95	2.20	5.00	5.22	6.70	5.28	2.09	.93	.85	3.49
1988	.82	.91	.58	.45	.42	.80	1.01	.86	.25	.097	.96	.13	.61
1989	.36	.83	1.21	.54	.004	5.54	1.00	.78	.70	.57	.80	4.42	1.40
1990	1.80	1.10	.82	.83	.97	2.77	3.52	19.6	18.0	4.67	2.60	.92	4.82
1991	1.11	1.43	.72	.64	.92	.98	4.25	38.7	43.9	7.56	4.00	2.26	8.89
1992	2.42	2.60	2.50	1.73	1.66	2.58	2.13	1.83	4.65	7.11	4.22	2.21	2.98
1993	2.32	2.44	1.76	1.59	1.73	3.40	8.52	23.8	37.2	12.4	8.06	5.93	9.12

Table E12.2. Statistics on mean flow, in cubic feet per second, for station 06404998, Grace Coolidge Creek near Game Lodge, near Custer (October 1976 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	17	17	17	17	17	17	17	17	17	17	17	17	17
Maximum	5.92	3.33	2.50	1.95	2.20	5.54	8.52	40.4	43.9	22.3	11.9	5.93	9.12
Percentile													
75th	2.37	1.95	1.60	1.08	1.16	2.67	3.21	21.7	16.2	7.34	3.89	2.88	4.57
50th	1.46	1.19	1.00	0.93	0.92	1.06	2.13	6.70	4.84	3.40	2.60	1.50	3.49
25th	0.90	0.96	0.76	0.62	0.65	0.80	1.49	0.96	1.12	1.08	0.87	0.67	1.34
Minimum	0.36	0.41	0.32	0.45	0.004	0.61	0.63	0.67	0.25	0.097	0.26	0.13	0.61
Mean	1.87	1.48	1.18	0.98	0.95	1.81	2.66	11.54	10.25	5.10	3.05	2.04	3.59
Standard deviation	1.44	0.77	0.59	0.42	0.53	1.54	1.92	13.44	13.06	5.64	2.98	1.80	2.52
Skewness	1.70	1.14	0.94	1.11	0.80	1.55	1.99	1.20	1.71	1.98	1.97	1.15	1.04
Coefficient of variation	0.77	0.52	0.50	0.43	0.55	0.85	0.72	1.16	1.27	1.10	0.98	0.88	0.70
Percent of annual flow	4.36	3.44	2.75	2.28	2.22	4.22	6.20	26.89	23.89	11.89	7.11	4.75	[1]0.015

[1]Serial correlation for annual mean flows.

Table E12.3. Serial correlation for 1-year lag for monthly mean flow for station 06404998, Grace Coolidge Creek near Game Lodge, near Custer (October 1976 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.363	-0.158	-0.211	-0.117	0.037	-0.017	0.012	-0.261	0.008	-0.111	-0.026	-0.344

Table E12.4. Correlation matrix for monthly mean flow for station 06404998, Grace Coolidge Creek near Game Lodge, near Custer (October 1976 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.821	0.661	0.676	0.674	0.353	0.418	-0.133	-0.061	-0.149	-0.205	-0.296
Nov.	*	1.000	.859	.906	.845	.467	.575	.016	.177	.092	.065	.001
Dec.	*	*	1.000	.881	.680	.537	.348	-.158	-.044	-.028	.027	.070
Jan.	*	*	*	1.000	.908	.449	.556	.020	.092	.204	.232	.129
Feb.	*	*	*	*	1.000	.342	.681	.146	.280	.412	.400	.182
Mar.	*	*	*	*	*	1.000	.396	-.133	.033	.003	.005	.384
Apr.	*	*	*	*	*	*	1.000	.358	.673	.321	.330	.365
May	*	*	*	*	*	*	*	1.000	.674	.130	.185	.007
June	*	*	*	*	*	*	*	*	1.000	.354	.315	.353
July	*	*	*	*	*	*	*	*	*	1.000	.951	.723
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	.742
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E12.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06404998, Grace Coolidge Creek near Game Lodge, near Custer

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1977	0.0000	1	0.0000	1	0.004	2	0.11	2	0.33	4	0.44	4	0.58	5	0.98	10	1.14	9
1978	.50	12	.53	12	.61	12	.67	12	.79	12	.80	11	.90	11	1.00	11	1.05	7
1979	.060	4	.10	4	.37	9	.50	9	.52	9	.56	8	.65	7	.73	7	1.25	11
1980	.25	9	.27	8	.30	7	.35	8	.42	6	.50	6	.56	4	.63	4	.75	4
1981	.45	11	.45	11	.49	11	.59	11	.61	11	.93	12	1.00	12	1.07	12	1.23	10
1982	.90	14	.92	14	.93	14	.94	13	1.03	13	1.09	13	1.18	13	1.31	13	1.98	13
1983	.18	6	.19	6	.20	4	.21	4	.27	3	.46	5	.66	8	.73	6	.75	5
1984	.30	10	.38	10	.46	10	.54	10	.60	10	.63	10	.74	10	.80	8	1.07	8
1985	.020	3	.037	3	.077	3	.16	3	.19	2	.24	2	.24	2	.28	1	.36	1
1986	.70	13	.75	13	.89	13	1.03	14	1.38	14	1.69	16	2.07	16	2.36	16	2.88	16
1987	.20	7	.20	7	.23	6	.26	6	.37	5	.43	3	.48	3	.54	3	.65	3
1988	.0000	2	.0000	2	.0000	1	.0000	1	.0000	1	.15	1	.23	1	.36	2	.41	2
1989	.10	5	.12	5	.20	5	.23	5	.51	7	.53	7	.59	6	.66	5	1.33	12
1990	.20	8	.27	9	.32	8	.34	7	.52	8	.63	9	.72	9	.81	9	.95	6
1991	1.00	16	1.07	15	1.30	15	1.43	15	1.49	15	1.68	15	1.92	15	2.11	15	2.20	15
1992	.96	15	1.22	16	1.39	16	1.49	16	1.52	16	1.58	14	1.69	14	1.83	14	1.98	14

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E12.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06404998, Grace Coolidge Creek near Game Lodge, near Custer

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1977	15.0	12	8.87	15	5.29	15	4.07	15	3.50	15	2.46	14	1.90	14	1.58	14	1.48	14
1978	76.0	6	67.7	5	63.1	5	50.7	5	40.8	2	25.8	3	18.4	3	14.6	3	10.0	3
1979	104	5	63.7	6	36.4	6	27.0	6	25.1	6	17.7	5	13.6	5	10.6	5	7.49	5
1980	13.0	14	12.7	12	8.06	14	5.85	14	3.51	14	2.31	15	1.86	15	1.54	15	1.25	15
1981	232	2	155	1	91.6	3	52.1	4	29.5	5	16.2	6	11.9	7	9.81	7	6.78	8
1982	39.0	8	35.7	7	29.0	7	23.9	7	21.4	7	15.6	7	11.9	8	9.53	8	6.99	7
1983	13.0	15	12.0	13	10.9	12	10.0	10	7.86	9	6.13	11	5.08	11	4.27	12	3.21	12
1984	33.0	9	30.0	8	24.4	8	20.4	8	14.6	8	14.2	8	12.5	6	10.4	6	7.42	6
1985	2.10	17	2.03	17	1.87	17	1.77	17	1.63	16	1.59	16	1.40	16	1.29	16	1.06	16
1986	19.0	11	13.8	10	11.3	11	8.53	12	6.51	12	5.56	12	5.06	12	4.36	11	3.50	11
1987	14.0	13	13.7	11	12.9	10	10.2	9	7.74	10	6.27	10	6.24	9	5.66	9	4.48	9
1988	22.0	10	8.43	16	3.84	16	1.90	16	1.11	17	1.00	17	.90	17	.79	17	.71	17
1989	67.0	7	25.4	9	13.7	9	9.23	11	5.84	13	3.41	13	2.53	13	2.07	13	1.89	13
1990	254	1	154	2	92.4	2	54.5	2	32.0	4	19.2	4	14.4	4	11.7	4	8.54	4
1991	148	4	124	3	100	1	90.8	1	68.7	1	42.3	1	30.7	1	24.4	1	16.8	1
1992	12.0	16	9.87	14	8.27	13	7.35	13	7.20	11	6.46	9	5.39	10	4.62	10	3.79	10
1993	179	3	123	4	79.1	4	54.1	3	37.3	3	30.9	2	24.8	2	20.8	2	16.0	2

Table E13.1. Mean flow, in cubic feet per second, for station 06405000, Grace Coolidge Creek near Custer

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.23	1.90	1.00	(2)
1946	1.45	1.60	1.23	1.43	1.41	1.53	1.54	14.3	17.2	10.1	3.47	7.28	5.21
1947	7.14	4.20	3.34	3.16	2.21	2.24	4.23	6.94	36.2	27.4	(1)	(1)	(2)
1967	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	9.62	1.19	.21	(2)
1968	.25	.63	.27	.27	.23	.84	.57	.27	5.92	1.62	2.71	1.91	1.28
1969	.92	1.01	.75	.24	.000	.13	1.73	2.60	1.15	5.87	2.00	.55	1.43
1970	1.22	1.33	.58	.63	.99	.80	2.24	5.46	14.7	.83	6.09	.99	2.98
1971	1.17	2.69	1.27	.53	1.19	2.52	18.7	25.5	22.8	4.26	.52	1.24	6.86
1972	2.50	3.23	1.80	1.36	1.42	1.63	2.07	3.10	29.0	8.33	3.46	.30	4.82
1973	1.73	.94	.18	.045	.000	.13	10.3	11.0	4.70	2.01	1.73	8.79	3.47
1974	1.44	1.28	.83	.000	.000	.000	.038	.000	.000	.000	.000	.50	.34
1975	.041	.000	.000	.000	.000	.52	1.00	.74	10.8	3.10	.22	.000	1.36
1976	.000	.000	.000	.000	.000	.000	.62	25.0	50.4	7.87	3.54	.53	7.31

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E13.2. Statistics on mean flow, in cubic feet per second, for station 06405000, Grace Coolidge Creek near Custer (October 1967 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	9	9	9	9	9	9	9	9	9	9	9	9	9
Maximum	2.50	3.23	1.80	1.36	1.42	2.52	18.7	25.5	50.4	8.33	6.09	8.79	7.31
Percentile													
75th	1.59	2.01	1.05	0.58	1.09	1.23	6.27	18.0	25.9	6.87	3.50	1.58	5.84
50th	1.17	1.01	0.58	0.24	0.000	0.52	1.73	3.10	10.8	3.10	2.00	0.55	2.98
25th	0.15	0.31	0.090	0.000	0.000	0.065	0.60	0.50	2.92	1.22	0.37	0.40	1.32
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.000	0.000	0.000	0.000	0.000	0.34
Mean	1.03	1.23	0.63	0.34	0.43	0.73	4.14	8.19	15.50	3.77	2.25	1.65	3.32
Standard deviation	0.83	1.10	0.61	0.45	0.60	0.86	6.28	10.25	16.32	3.03	1.96	2.74	2.53
Skewness	0.30	0.85	0.87	1.67	0.93	1.34	2.01	1.22	1.35	0.46	0.76	2.77	0.62
Coefficient of variation	0.81	0.89	0.96	1.31	1.40	1.17	1.52	1.25	1.05	0.80	0.87	1.66	0.76
Percent of annual flow	2.58	3.10	1.58	0.86	1.07	1.83	10.38	20.53	38.86	9.44	5.65	4.13	[1]0.188

[1]Serial correlation for annual mean flows.

Table E13.3. Serial correlation for 1-year lag for monthly mean flow for station 06405000, Grace Coolidge Creek near Custer (October 1967 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.463	0.458	0.110	0.165	0.422	0.332	-0.200	-0.254	0.172	-0.171	-0.250	-0.216

Table E13.4. Correlation matrix for monthly mean flow for station 06405000, Grace Coolidge Creek near Custer (October 1967 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.815	0.767	0.666	0.571	0.317	0.264	-0.148	-0.142	0.066	0.102	0.278
Nov.	*	1.000	.963	.841	.864	.768	.467	.090	.081	.243	.058	-.083
Dec.	*	*	1.000	.828	.789	.672	.281	-.027	.063	.319	.018	-.280
Jan.	*	*	*	1.000	.908	.676	.108	-.076	.260	.411	.453	-.237
Feb.	*	*	*	*	1.000	.859	.391	.182	.320	.255	.382	-.229
Mar.	*	*	*	*	*	1.000	.643	.318	.233	.204	-.007	-.191
Apr.	*	*	*	*	*	*	1.000	.631	.046	-.012	-.28.7	.419
May	*	*	*	*	*	*	*	1.000	.698	.397	.031	.127
June	*	*	*	*	*	*	*	*	1.000	.713	.372	-.274
July	*	*	*	*	*	*	*	*	*	1.000	.167	-.287
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	-.053
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E13.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06405000, Grace Coolidge Creek near Custer

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1968	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.010	5	0.12	5	0.28	5	0.51	3
1969	.0000	2	.0000	2	.14	7	.21	7	.43	7	.58	6	.71	6	.74	6	.87	6
1970	.0000	3	.0000	3	.0000	2	.10	6	.39	6	.60	7	.90	7	1.23	7	1.30	7
1971	.080	8	.080	8	.15	8	.32	8	.46	8	.86	8	1.23	8	1.54	8	1.77	8
1972	.0000	4	.0000	4	.0000	3	.0000	2	.0000	2	.006	4	.016	4	.072	3	.52	4
1973	.0000	5	.0000	5	.0000	4	.0000	3	.0000	3	.0000	1	.0000	1	.19	4	.61	5
1974	.0000	6	.0000	6	.0000	5	.0000	4	.0000	4	.0000	2	.0000	2	.0000	1	.037	2
1975	.0000	7	.0000	7	.0000	6	.0000	5	.0000	5	.0000	3	.0000	3	.0000	2	.0000	1

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E13.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06405000, Grace Coolidge Creek near Custer

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1968	26.0	7	18.0	7	13.7	7	8.47	8	6.14	8	3.82	8	3.47	7	3.07	8	2.21	8
1969	16.0	8	15.3	8	12.5	8	10.1	7	6.52	7	4.05	7	3.30	8	3.12	7	2.35	7
1970	92.0	3	71.7	3	44.6	4	26.3	4	15.5	5	10.3	5	7.77	5	7.05	5	5.07	5
1971	70.0	4	62.0	4	49.0	3	37.9	3	30.1	3	29.7	2	22.6	2	18.2	2	12.5	2
1972	230	2	107	2	57.9	2	50.1	2	32.7	2	19.7	3	14.2	3	11.2	3	7.96	3
1973	38.0	6	29.3	6	22.9	6	21.4	5	17.0	4	11.8	4	8.81	4	7.12	4	6.40	4
1974	5.60	9	4.60	9	3.37	9	2.51	9	1.72	9	1.42	9	1.21	9	.91	9	.60	9
1975	57.0	5	37.3	5	25.0	5	17.6	6	12.0	6	7.02	6	5.00	6	3.95	6	2.71	6
1976	481	1	256	1	141	1	81.9	1	57.8	1	37.9	1	28.0	1	22.1	1	14.6	1

Table E14.1. Mean flow, in cubic feet per second, for station 06406000, Battle Creek at Hermosa

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1949	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	8.24	4.12	(2)
1950	5.05	5.85	4.71	3.18	2.61	3.97	4.65	8.51	4.51	5.13	1.31	2.55	4.35
1951	1.96	3.11	3.35	2.84	2.75	2.85	2.98	2.96	12.9	16.2	4.71	5.68	5.20
1952	3.69	3.36	3.38	2.29	2.84	3.29	2.57	125	31.6	9.30	2.19	1.26	16.1
1953	2.54	2.93	2.41	2.54	2.89	3.27	3.31	7.47	13.3	2.49	12.3	1.10	4.72
1954	1.83	1.89	2.07	1.86	2.54	3.05	2.67	1.54	.78	.35	.22	.19	1.58
1955	.24	.97	1.78	1.52	1.33	1.65	1.39	.74	1.29	.73	.24	.050	.99
1956	.10	.23	.31	.89	1.21	1.53	.94	15.1	3.46	5.85	3.30	.16	2.78
1957	.14	.51	.69	.62	.69	.80	2.18	88.0	97.7	49.7	25.5	5.15	22.8
1958	3.00	3.28	2.68	2.66	2.78	3.28	11.7	20.9	13.1	5.25	2.61	1.78	6.10
1959	1.66	1.98	2.55	2.90	2.16	2.24	2.24	2.24	4.80	5.33	.68	.74	2.46
1960	1.06	1.20	1.61	1.74	1.75	1.91	1.08	3.97	4.68	.85	.27	.14	1.69
1961	.10	.32	.77	.71	.64	.73	.89	.93	3.17	3.87	.17	.10	1.04
1962	.10	.10	.10	.19	.31	.41	.34	47.5	93.5	75.5	17.3	2.07	19.9
1963	4.92	5.25	3.55	2.00	2.44	3.97	17.3	26.5	100	25.5	5.62	5.83	16.9
1964	2.63	3.59	3.35	3.68	3.70	3.87	3.77	8.95	23.4	21.3	2.48	1.47	6.85
1965	2.62	2.73	2.30	2.58	2.84	2.75	2.99	129	102	46.5	13.6	5.62	26.5
1966	6.60	7.29	6.07	5.13	4.82	6.01	7.08	6.00	3.30	2.49	3.12	1.63	4.97
1967	2.65	2.73	2.13	2.05	2.25	3.20	2.89	3.77	158	25.8	9.04	6.88	18.3
1968	6.67	7.36	6.57	5.23	6.16	5.66	5.35	4.85	13.8	5.12	5.29	5.80	6.47
1969	5.76	4.85	4.48	4.98	3.00	3.85	4.17	3.27	2.82	29.5	3.21	3.86	6.20
1970	2.78	3.26	2.25	3.34	2.32	2.37	4.22	6.95	26.6	2.86	2.34	1.68	5.06
1971	2.67	2.60	2.35	2.33	4.15	3.53	31.9	57.2	80.8	14.3	6.06	4.99	17.7
1972	5.62	6.06	5.81	3.76	3.94	4.86	4.91	9.34	142	29.5	17.1	8.75	20.0
1973	7.89	8.88	5.82	5.07	5.03	5.97	28.6	31.8	19.0	8.12	6.42	8.78	11.8
1974	7.46	7.85	6.04	4.85	5.71	5.35	5.62	5.32	3.28	2.38	1.54	1.77	4.76
1975	1.86	3.61	2.12	2.11	2.59	3.59	8.98	6.56	18.6	2.64	2.01	1.73	4.68
1976	3.15	2.32	2.88	2.13	2.46	2.93	3.63	44.4	107	17.2	11.1	6.05	17.0
1977	6.47	6.47	6.45	5.60	5.09	5.59	6.11	4.98	2.47	4.08	3.65	2.89	4.99
1978	4.76	4.06	3.94	3.41	3.19	6.25	4.09	86.5	30.3	11.8	8.13	4.64	14.4
1979	5.03	6.59	5.90	4.59	3.95	4.76	5.28	4.90	2.12	19.6	16.5	9.57	7.44
1980	10.5	10.6	8.96	5.83	3.77	4.24	4.94	3.93	2.43	1.50	1.93	2.03	5.06
1981	1.80	3.00	3.03	2.76	2.29	2.65	1.91	38.5	4.80	2.93	2.18	2.02	5.71
1982	2.95	2.89	2.92	3.28	2.77	2.77	3.20	9.01	23.6	9.87	10.0	7.16	6.71
1983	8.93	8.51	6.86	5.63	4.83	5.10	5.35	10.5	8.05	8.73	5.93	3.61	6.86
1984	5.47	5.29	3.55	4.03	3.23	3.92	4.76	16.0	57.4	21.6	13.6	10.1	12.4
1985	9.76	8.83	7.57	6.63	4.79	5.05	5.55	4.08	3.02	5.65	2.13	2.34	5.46
1986	2.65	3.17	3.07	3.02	3.70	2.86	4.20	11.1	14.8	4.96	3.13	5.05	5.13
1987	8.70	6.99	7.09	6.13	5.51	9.98	9.33	11.4	11.4	7.37	4.92	4.53	7.79
1988	4.48	4.55	4.30	3.15	3.17	2.86	2.01	2.75	1.57	1.06	1.07	1.39	2.70
1989	1.66	2.21	1.99	1.85	1.73	2.04	1.57	1.41	1.05	.23	.37	3.08	1.59
1990	1.38	1.80	1.69	2.41	1.40	1.29	1.51	27.8	29.4	8.45	2.97	2.18	6.88
1991	2.73	2.78	2.45	2.14	2.34	2.47	3.10	77.5	149	18.5	6.53	5.88	23.0
1992	5.67	6.72	6.37	4.90	4.51	5.27	4.53	4.81	4.52	5.17	4.86	4.91	5.19
1993	4.55	4.53	3.12	2.93	2.65	3.83	6.32	81.7	132	34.0	20.4	17.1	26.1

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E14.2. Statistics on mean flow, in cubic feet per second, for station 06406000, Battle Creek at Hermosa (October 1949 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	44	44	44	44	44	44	44	44	44	44	44	44	44
Maximum	10.5	10.6	8.96	6.63	6.16	9.98	31.9	129	158	75.5	25.5	17.1	26.5
Percentile													
75th	5.66	6.37	5.82	4.78	3.95	4.83	5.50	30.8	50.9	19.3	8.81	5.77	15.7
50th	2.97	3.32	3.09	2.91	2.81	3.28	4.13	8.73	13.2	6.61	3.47	2.98	6.15
25th	1.84	2.39	2.16	2.11	2.30	2.51	2.32	4.00	3.28	2.88	2.04	1.64	4.73
Minimum	0.10	0.10	0.10	0.19	0.31	0.41	0.34	0.74	0.78	0.23	0.17	0.050	0.99
Mean	3.91	4.16	3.67	3.22	3.06	3.59	5.50	24.22	35.53	13.16	6.09	3.96	9.19
Standard deviation	2.73	2.61	2.12	1.59	1.39	1.78	6.27	33.36	47.20	15.42	6.07	3.38	7.27
Skewness	0.63	0.53	0.56	0.32	0.26	0.96	3.14	1.89	1.42	2.17	1.45	1.59	1.02
Coefficient of variation	0.70	0.63	0.58	0.49	0.45	0.50	1.14	1.38	1.33	1.17	1.00	0.85	0.79
Percent of annual flow	3.56	3.78	3.33	2.92	2.78	3.26	5.00	22.00	32.28	11.96	5.53	3.60	[1]-0.053

[1]Serial correlation for annual mean flows.

Table E14.3. Serial correlation for 1-year lag for monthly mean flow for station 06406000, Battle Creek at Hermosa (October 1949 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.260	0.312	0.227	0.323	0.335	0.249	-0.019	-0.201	-0.067	-0.005	-0.118	0.153

Table E14.4. Correlation matrix for monthly mean flow for station 06406000, Battle Creek at Hermosa (October 1949 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.970	0.953	0.920	0.833	0.821	0.312	-0.172	-0.168	-0.205	-0.063	0.253
Nov.	*	1.000	0.964	0.915	0.847	0.795	0.335	-0.236	-0.218	-0.249	-0.082	0.258
Dec.	*	*	1.000	0.941	0.862	0.817	0.224	-0.266	-0.276	-0.291	-0.124	0.185
Jan.	*	*	*	1.000	0.883	0.822	0.222	-0.301	-0.345	-0.309	-0.153	0.185
Feb.	*	*	*	*	1.000	0.870	0.412	-0.199	-0.234	-0.317	-0.124	0.218
Mar.	*	*	*	*	*	1.000	0.381	-0.130	-0.166	-0.245	-0.052	0.268
Apr.	*	*	*	*	*	*	1.000	0.079	0.103	-0.051	-0.001	0.273
May	*	*	*	*	*	*	*	1.000	0.525	0.502	0.456	0.282
June	*	*	*	*	*	*	*	*	1.000	0.677	0.654	0.570
July	*	*	*	*	*	*	*	*	*	1.000	0.764	0.414
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.683
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E14.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06406000, Battle Creek at Hermosa

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1950	0.70	15	0.77	14	0.91	15	1.05	13	1.19	12	1.78	16	1.92	14	2.13	13	2.51	19
1951	.80	17	.93	19	1.34	23	1.83	26	2.14	25	2.51	24	2.74	25	2.91	25	3.14	24
1952	.70	16	.70	13	.83	12	.99	12	1.26	13	1.72	14	1.98	15	2.20	14	2.31	17
1953	.80	18	.83	16	.87	13	.91	11	1.06	11	1.44	9	1.58	9	1.68	9	1.79	9
1954	.0000	1	.0000	1	.0000	1	.021	3	.090	3	.18	5	.17	4	.24	4	.45	5
1955	.0000	2	.0000	2	.0000	2	.007	1	.050	1	.075	1	.13	2	.15	2	.26	2
1956	.0000	3	.0000	3	.0000	3	.007	2	.070	2	.14	4	.22	5	.33	5	.44	4
1957	.90	21	.90	17	1.37	24	1.54	24	2.18	26	2.56	26	2.68	24	2.82	24	2.90	23
1958	1.20	27	1.20	24	1.26	21	1.40	20	1.52	19	1.71	13	1.79	12	1.93	12	2.17	12
1959	.0000	4	.0000	4	.0000	4	.021	4	.18	6	.64	7	.81	7	.91	7	1.17	6
1960	.10	7	.10	6	.10	6	.10	5	.10	4	.12	3	.13	3	.19	3	.37	3
1961	.10	8	.10	7	.10	7	.10	6	.10	5	.10	2	.10	1	.10	1	.12	1
1962	.20	10	.20	9	.23	8	.27	8	.34	8	2.11	20	2.35	21	2.72	23	3.32	25
1963	2.00	31	2.03	31	2.16	29	2.20	28	2.49	28	3.07	29	3.15	28	3.30	28	3.44	26
1964	.80	19	.93	20	1.07	17	1.21	18	1.37	15	1.79	17	2.08	17	2.23	16	2.30	16
1965	2.10	35	2.10	33	2.30	32	2.56	32	2.60	30	4.98	41	5.23	39	5.51	38	5.89	35
1966	.90	22	1.07	23	1.16	19	1.40	21	1.58	20	2.07	19	2.14	18	2.27	18	2.22	14
1967	2.10	36	2.10	34	2.21	30	2.33	29	2.89	33	3.09	30	5.58	43	5.88	42	6.27	39
1968	2.10	37	2.30	37	2.41	33	2.46	30	2.57	29	3.46	32	3.88	31	4.10	31	4.53	31
1969	.94	23	1.05	22	1.44	26	1.48	23	1.63	21	2.36	23	2.60	23	2.53	22	2.71	22
1970	.86	20	.92	18	1.08	18	1.19	17	1.42	16	1.64	11	2.05	16	2.22	15	2.21	13
1971	1.50	28	1.70	28	2.59	36	3.40	40	3.72	39	3.83	35	4.16	33	4.58	32	5.00	32
1972	3.00	41	3.07	41	3.09	41	3.79	42	4.58	42	4.94	40	5.13	37	5.47	36	6.46	40
1973	2.00	32	2.43	39	2.83	40	2.91	39	4.29	41	5.07	42	5.26	40	5.47	37	6.21	38
1974	.42	11	.46	11	.88	14	1.14	14	1.34	14	1.57	10	1.60	10	1.80	11	2.15	11
1975	.57	13	.81	15	.94	16	1.17	15	1.47	17	1.74	15	1.89	13	2.24	17	2.28	15
1976	2.20	39	2.23	36	2.60	37	2.84	38	3.63	38	5.29	43	5.43	41	5.68	41	5.94	36
1977	1.00	25	1.30	26	1.43	25	1.87	27	2.21	27	2.51	25	3.35	29	3.16	27	3.61	27
1978	3.30	42	3.30	42	3.36	42	3.66	41	3.80	40	4.17	36	4.45	35	4.81	33	5.08	33
1979	.080	6	.19	8	.66	10	1.18	16	1.94	23	3.32	31	3.95	32	5.66	40	7.32	43
1980	.16	9	.21	10	.34	9	.42	9	1.03	10	1.66	12	1.68	11	1.74	10	2.07	10
1981	.42	12	.97	21	1.24	20	1.26	19	1.64	22	2.05	18	2.36	22	2.44	20	2.63	20
1982	2.00	33	2.13	35	2.47	35	2.82	37	3.02	34	4.93	39	5.20	38	5.61	39	6.67	41
1983	2.30	40	2.33	38	2.67	39	2.74	36	3.21	37	3.47	33	3.59	30	3.68	30	4.17	30
1984	3.80	43	4.00	43	4.14	43	4.25	43	4.76	43	4.92	38	5.51	42	6.02	43	7.15	42
1985	.94	24	1.35	27	1.49	27	1.59	25	1.96	24	2.14	22	2.25	20	2.50	21	2.67	21
1986	2.10	38	2.47	40	2.60	38	2.68	34	3.09	36	3.53	34	4.31	34	5.41	35	5.97	37
1987	1.90	30	2.00	30	2.27	31	2.73	35	2.84	32	3.01	28	3.05	27	3.35	29	3.76	29
1988	.61	14	.64	12	.69	11	.76	10	.91	9	1.06	8	1.17	8	1.22	8	1.49	8
1989	.0000	5	.0000	5	.029	5	.15	7	.21	7	.28	6	.45	6	.67	6	1.24	7
1990	1.00	26	1.23	25	1.27	22	1.40	22	1.51	18	2.11	21	2.20	19	2.35	19	2.43	18
1991	1.50	29	1.70	29	2.07	28	2.63	33	3.02	35	4.64	37	4.89	36	5.27	34	5.58	34
1992	2.00	34	2.07	32	2.46	34	2.48	31	2.66	31	2.79	27	2.88	26	3.11	26	3.62	28

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E14.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06406000, Battle Creek at Hermosa

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1950	43.0	32	20.6	33	14.7	33	11.5	31	8.86	33	7.33	34	6.38	36	5.90	37	4.92	37
1951	98.0	24	60.0	24	39.3	24	24.9	25	23.2	23	15.2	23	12.1	23	9.99	24	7.59	24
1952	1,520	2	1,005	1	508	1	272	1	153	4	83.6	8	56.8	9	43.3	10	29.4	11
1953	140	21	86.7	20	46.3	22	23.5	27	13.5	29	12.9	25	10.4	27	9.19	26	7.13	29
1954	5.00	44	4.67	44	4.19	43	3.69	43	3.34	42	3.01	42	2.76	42	2.57	41	2.35	41
1955	13.0	39	6.67	42	3.46	44	2.09	44	1.80	44	1.66	44	1.57	44	1.58	44	1.44	44
1956	198	15	83.7	21	38.8	25	35.8	19	18.4	25	12.2	27	9.25	30	7.17	32	5.15	36
1957	540	9	347	10	233	9	156	8	138	6	95.9	5	83.0	4	66.5	3	44.9	3
1958	67.0	26	48.3	25	39.9	23	34.3	21	24.0	21	18.8	18	15.4	20	12.9	18	9.53	19
1959	29.0	36	19.7	35	13.6	34	9.33	35	7.29	37	5.42	38	4.18	39	3.72	39	3.22	39
1960	72.0	25	29.3	30	14.9	32	7.90	37	7.34	36	4.37	40	3.32	40	2.95	40	2.53	40
1961	44.0	31	26.2	32	11.6	36	7.65	38	5.73	40	3.68	41	2.78	41	2.29	42	1.73	43
1962	433	13	277	12	200	11	142	10	122	9	101	4	78.5	5	59.9	5	39.5	5
1963	664	5	390	8	233	10	146	9	101	10	66.6	11	54.7	11	43.3	11	30.2	10
1964	111	22	71.3	23	47.6	21	35.1	20	30.6	18	22.6	16	18.1	16	14.6	16	10.9	16
1965	748	4	547	3	305	6	254	4	156	3	124	1	96.5	1	74.5	1	50.2	1
1966	24.0	38	13.6	38	12.9	35	10.3	33	8.22	34	7.08	35	6.68	34	6.30	34	6.11	33
1967	660	6	503	6	428	2	258	2	158	2	92.0	6	64.5	6	50.1	6	34.0	7
1968	51.0	29	43.0	27	28.6	28	17.2	29	14.3	28	9.78	30	8.26	32	7.57	31	6.96	31
1969	183	16	117	18	88.3	16	58.7	17	31.7	17	17.3	21	12.7	22	10.3	22	7.97	22
1970	201	14	149	14	86.0	17	47.9	18	28.4	19	17.1	22	12.8	21	10.3	23	7.65	23
1971	519	10	356	9	235	8	141	11	95.8	11	78.4	9	59.8	8	46.9	8	32.5	8
1972	1,750	1	733	2	377	3	254	3	152	5	89.2	7	63.4	7	50.0	7	34.9	6
1973	181	17	121	17	79.0	18	64.1	16	48.6	15	35.9	14	26.9	14	22.2	14	17.1	14
1974	10.0	41	9.50	40	8.93	39	8.45	36	8.10	35	7.80	33	7.19	33	6.57	33	6.21	32
1975	152	19	96.0	19	57.6	19	33.2	23	18.8	24	12.8	26	11.5	24	9.48	25	7.18	28
1976	860	3	517	4	298	7	181	7	123	8	76.5	10	56.7	10	45.3	9	31.4	9
1977	36.0	34	16.8	37	9.66	38	7.33	39	7.10	38	6.68	36	6.52	35	6.30	35	6.00	34
1978	177	18	138	15	115	14	96.8	13	89.4	12	59.6	12	43.8	12	34.9	12	24.8	12
1979	101	23	72.7	22	52.9	20	34.3	22	23.9	22	18.8	19	15.6	19	12.2	20	9.73	18
1980	12.0	40	11.3	39	11.0	37	10.8	32	10.7	31	10.6	29	10.1	28	9.05	27	7.32	26
1981	503	11	270	13	146	13	77.7	15	41.7	16	22.4	17	16.0	17	12.4	19	8.99	21
1982	45.0	30	41.3	28	30.9	27	28.1	24	24.3	20	18.4	20	15.7	18	13.8	17	10.5	17
1983	26.0	37	20.0	34	16.7	31	13.9	30	11.4	30	9.61	31	9.46	29	8.50	29	7.35	25
1984	143	20	121	16	114	15	91.7	14	59.9	13	40.0	13	32.4	13	27.5	13	20.5	13
1985	57.0	28	39.0	29	18.7	30	9.97	34	9.79	32	9.32	32	8.78	31	8.26	30	7.13	30
1986	60.0	27	46.3	26	36.0	26	24.5	26	15.7	26	13.2	24	10.6	26	8.85	28	7.19	27
1987	32.0	35	28.7	31	24.0	29	17.9	28	14.4	27	11.5	28	10.8	25	10.6	21	9.18	20
1988	5.10	43	4.80	43	4.76	42	4.71	42	4.64	41	4.58	39	4.46	38	4.14	38	3.76	38
1989	43.0	33	18.8	36	8.67	40	4.88	41	3.08	43	2.14	43	2.05	43	1.98	43	1.94	42
1990	438	12	310	11	185	12	101	12	55.4	14	31.5	15	22.6	15	17.5	15	12.1	15
1991	607	7	484	7	344	4	253	5	189	1	118	2	83.3	3	63.9	4	43.3	4
1992	8.50	42	7.47	41	7.33	41	7.07	40	6.75	39	6.55	37	6.27	37	5.96	36	5.58	35
1993	597	8	511	5	320	5	203	6	132	7	110	3	83.7	2	67.8	2	48.5	2

Table E15.1. Mean flow, in cubic feet per second, for station 06407500, Spring Creek near Keystone

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	15.7	10.7	1.32	(2)
1946	13.1	3.99	.29	.44	1.66	2.70	4.44	110	120	109	26.5	23.4	34.9
1947	22.6	17.6	7.55	7.48	9.61	8.77	20.4	26.0	145	108	(1)	(1)	(2)
1987	15.7	8.10	5.00	4.15	4.04	24.0	24.0	31.0	19.9	7.89	3.33	.74	12.4
1988	.30	.35	.22	.17	.80	4.54	5.29	8.18	1.58	.047	.022	.000	1.80
1989	.000	.006	.076	.10	.010	.74	3.47	5.11	1.61	.16	.001	.49	.98
1990	.37	1.01	1.23	1.08	1.13	3.17	11.4	26.9	35.8	13.0	7.41	1.58	8.69
1991	1.87	3.28	1.94	1.58	3.34	6.53	15.1	84.4	147	44.0	20.4	6.25	28.0
1992	6.25	7.31	5.85	4.57	5.40	10.8	8.67	6.49	10.3	13.7	7.25	2.81	7.46
1993	1.49	3.19	2.69	3.13	3.64	11.3	21.9	97.2	146	70.7	32.5	17.5	34.4

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E15.2. Statistics on mean flow, in cubic feet per second, for station 06407500, Spring Creek near Keystone (October 1986 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	7	7	7	7	7	7	7	7	7	7	7	7	7
Maximum	15.7	8.10	5.85	4.57	5.40	24.0	24.0	97.2	147	70.7	32.5	17.5	34.4
Percentile													
75th	6.25	7.31	5.00	4.15	4.04	11.3	21.9	84.4	146	44.0	20.4	6.25	28.0
50th	1.49	3.19	1.94	1.58	3.34	6.53	11.4	26.9	19.9	13.0	7.25	1.58	8.69
25th	0.30	0.35	0.22	0.17	0.80	3.17	5.29	6.49	1.61	0.16	0.022	0.49	1.80
Minimum	0.000	0.006	0.076	0.10	0.010	0.74	3.47	5.11	1.58	0.047	0.001	0.000	0.98
Mean	3.71	3.32	2.43	2.11	2.62	8.73	12.83	37.04	51.74	21.36	10.13	4.20	13.39
Standard deviation	5.70	3.26	2.25	1.84	1.99	7.76	7.92	38.27	65.79	26.33	12.06	6.24	12.92
Skewness	2.01	0.66	0.64	0.29	-0.05	1.41	0.39	0.99	1.10	1.39	1.31	2.10	0.93
Coefficient of variation	1.54	0.98	0.93	0.87	0.76	0.89	0.62	1.03	1.27	1.23	1.19	1.49	0.96
Percent of annual flow	2.32	2.07	1.52	1.32	1.64	5.45	8.01	23.12	32.29	13.33	6.32	2.62	[1]-0.090

[1]Serial correlation for annual mean flows.

Table E15.3. Serial correlation for 1-year lag for monthly mean flow for station 06407500, Spring Creek near Keystone (October 1986 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.216	0.058	0.077	0.198	0.438	0.114	-0.266	-0.362	-0.201	0.125	0.210	0.271

Table E15.4. Correlation matrix for monthly mean flow for station 06407500, Spring Creek near Keystone (October 1986 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.877	0.780	0.744	0.609	0.939	0.607	-0.092	-0.205	-0.170	-0.185	-0.194
Nov.	*	1.000	0.975	0.949	0.906	0.874	0.595	0.073	0.014	0.098	0.096	0.057
Dec.	*	*	1.000	0.980	0.932	0.789	0.524	0.045	0.003	0.135	0.140	0.118
Jan.	*	*	*	1.000	0.943	0.815	0.634	0.188	0.128	0.290	0.294	0.294
Feb.	*	*	*	*	1.000	0.706	0.588	0.335	0.319	0.423	0.428	0.370
Mar.	*	*	*	*	*	1.000	0.799	0.184	0.052	0.131	0.113	0.123
Apr.	*	*	*	*	*	*	1.000	0.684	0.563	0.601	0.589	0.549
May	*	*	*	*	*	*	*	1.000	0.983	0.948	0.940	0.857
June	*	*	*	*	*	*	*	*	1.000	0.945	0.941	0.835
July	*	*	*	*	*	*	*	*	*	1.000	0.999	0.964
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.960
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E15.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06407500, Spring Creek near Keystone

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1987	.050	3	.063	3	.067	3	.075	3	.11	3	.17	3	.23	3	.24	3	.38	2
1988	.0000	1	.0000	1	.0000	1	.0000	1	.0000	1	.0000	1	.0000	1	.003	1	.024	1
1989	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.002	2	.16	2	.24	2	.51	3
1990	.51	4	.58	5	.83	5	1.05	5	1.20	5	1.71	4	2.00	4	2.11	4	2.23	4
1991	4.00	6	4.13	6	4.33	6	4.48	6	4.54	6	4.71	6	5.22	6	5.67	6	5.95	6
1992	.55	5	.56	4	.60	4	.75	4	1.13	4	1.94	5	2.17	5	2.38	5	2.81	5

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E15.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive day, for station 06407500, Spring Creek near Keystone

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1987	96.0	3	73.0	4	55.6	4	39.2	4	32.5	4	28.9	4	28.2	3	25.3	3	18.6	3
1988	12.0	7	11.3	7	9.97	7	8.92	6	8.21	6	6.82	6	6.30	6	5.06	6	3.44	6
1989	24.0	5	20.0	6	14.0	6	8.09	7	5.93	7	4.37	7	3.57	7	2.81	7	1.89	7
1990	86.0	4	74.3	3	64.7	3	53.8	3	40.7	3	33.2	3	26.0	4	22.4	4	16.3	4
1991	245	2	236	2	215	2	189	2	161	1	121	2	93.3	2	75.5	2	53.0	2
1992	23.0	6	20.3	5	18.6	5	16.6	5	15.3	5	12.9	5	10.8	5	10.1	5	9.64	5
1993	267	1	260	1	233	1	191	1	146	2	125	1	106	1	88.2	1	64.7	1

Table E16.1. Mean flow, in cubic feet per second, for station 06408500, Spring Creek near Hermosa

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1949	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.66	1.53	(2)
1950	1.90	1.70	1.87	1.30	1.78	1.06	0.83	1.48	0.79	0.53	.97	.29	1.21
1951	.20	.37	.52	.23	.071	.23	.063	.10	.33	.077	.000	.12	.19
1952	.17	.10	.10	.12	.22	.22	.10	65.9	15.1	10.9	1.82	1.83	8.13
1953	2.17	1.91	1.16	1.07	1.08	1.45	1.37	1.03	4.78	1.14	.45	.17	1.48
1954	.48	.66	.53	.41	.47	.67	.54	.34	.067	.000	3.35	.000	.63
1955	.068	.10	.16	.12	.14	.24	.31	.074	.15	.000	.000	.000	.11
1956	.000	.000	.013	.006	.045	.045	.017	.11	.000	.055	.000	.000	.024
1957	.000	.000	.000	.000	.000	.000	.090	32.0	73.4	23.6	2.95	1.98	11.2
1958	2.41	2.32	2.49	2.11	1.43	1.12	1.13	1.41	1.81	1.19	.59	.15	1.52
1959	.44	.61	.64	.33	.41	.40	.33	.32	.080	.006	.000	.000	.30
1960	.000	.000	.000	.045	.034	.31	.013	.000	.000	.000	.000	.000	.034
1961	.000	.000	.000	.000	.000	.000	.000	.000	.000	.010	.000	.000	.001
1962	.000	.000	.000	.000	.000	.000	.000	2.32	82.0	73.2	16.4	3.33	14.8
1963	2.89	2.20	2.73	1.74	1.90	2.05	3.47	12.9	94.3	29.7	5.27	2.93	13.5
1964	2.32	2.55	2.74	2.48	2.00	1.71	1.20	1.07	6.41	10.6	1.57	1.44	3.01
1965	2.80	1.89	1.52	1.49	1.36	.97	.99	78.5	130	61.4	15.8	3.65	25.1
1966	2.76	2.60	2.37	1.83	1.71	2.31	1.57	1.15	.66	.26	1.23	.56	1.59
1967	.91	.99	.95	1.22	.82	.69	.87	1.13	103	30.4	3.06	2.21	12.1
1968	2.68	2.40	2.59	2.29	2.26	2.36	1.69	1.08	2.75	.79	1.03	.50	1.87
1969	.43	.66	.48	.28	.000	2.03	.79	.42	.28	24.8	.000	.000	2.56
1970	.035	.52	.23	.37	.32	.21	.26	.47	1.36	.068	.000	.000	.32
1971	.086	.47	.57	.69	20.8	1.22	5.24	73.8	95.5	9.37	1.60	1.45	17.5
1972	2.11	6.54	2.97	2.27	2.89	1.84	1.61	1.39	271	33.5	4.45	2.83	27.5
1973	1.03	1.57	1.51	1.80	2.21	2.33	3.22	9.75	12.5	4.13	2.22	1.91	3.68
1974	1.79	2.25	1.99	1.26	1.46	1.04	1.36	.96	.75	.25	.73	.13	1.16
1975	.48	.33	.28	.18	.39	.46	.71	.32	.63	.000	.000	.000	.31
1976	.000	.027	.12	.32	.66	.74	.78	.78	71.9	7.71	1.50	1.26	7.06
1977	1.55	1.42	1.97	1.70	1.77	1.81	3.62	1.39	2.13	.65	.36	.27	1.55
1978	.49	.41	.36	.31	.50	.86	.69	62.4	35.5	3.73	2.33	1.59	9.16
1979	1.60	1.16	1.01	.000	.000	1.65	1.13	1.25	.53	.72	1.00	.45	.88
1980	.032	.74	.28	.23	.26	.31	.53	.26	4.55	.11	.000	.000	.60
1981	.000	.000	.011	.025	.031	.074	.015	.38	.000	.000	.000	.000	.045
1982	.000	.000	.000	.000	.000	.000	.000	.000	2.99	2.98	.58	1.19	.65
1983	2.28	1.51	1.44	1.45	1.20	1.15	.91	2.04	3.88	2.36	2.52	2.77	1.96
1984	2.42	2.23	1.89	2.12	1.95	1.16	1.28	3.04	41.9	9.41	2.98	3.15	6.09
1985	3.19	3.06	1.79	1.96	2.06	4.22	1.21	.98	.65	.24	.39	.44	1.68
1986	.61	.34	.35	.47	.74	.97	1.56	1.17	1.06	.49	.19	.40	.69
1987	.64	.77	.71	.82	.52	.96	.52	.60	.53	.044	.000	.000	.51
1988	.092	.31	.24	.45	.65	1.74	.36	.42	.028	.000	.000	.000	.36
1989	.000	.000	.000	.000	.000	.069	.000	.000	.000	.000	.000	.000	.006
1990	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1991	.000	.000	.000	.000	.000	.000	.000	30.9	137	12.1	2.73	1.93	15.3
1992	1.88	1.94	1.77	1.83	1.41	1.20	1.06	.64	.39	.67	.21	.083	1.09
1993	.21	.31	.25	.17	.21	.57	1.69	34.1	116	34.4	11.6	3.72	16.9

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E16.2. Statistics on mean flow, in cubic feet per second, for station 06408500, Spring Creek near Hermosa (October 1949 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	44	44	44	44	44	44	44	44	44	44	44	44	44
Maximum	3.19	6.54	2.97	2.48	20.8	4.22	5.24	78.5	271	73.2	16.4	3.72	27.5
Percentile													
75th	2.06	1.90	1.78	1.65	1.65	1.60	1.34	2.25	40.3	10.3	2.47	1.89	7.86
50th	0.48	0.63	0.52	0.39	0.51	0.91	0.78	1.05	1.58	0.69	0.66	0.34	1.50
25th	0.008	0.045	0.10	0.064	0.037	0.22	0.093	0.32	0.29	0.047	0.000	0.000	.33
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mean	0.98	1.07	0.92	0.81	1.27	0.96	0.98	9.74	29.92	8.90	2.04	0.97	4.87
Standard deviation	1.07	1.26	0.95	0.82	3.12	0.89	1.11	21.09	55.53	16.42	3.72	1.20	7.04
Skewness	0.67	2.11	0.76	0.64	5.94	1.28	2.02	2.39	2.47	2.48	2.98	1.01	1.74
Coefficient of variation	1.09	1.18	1.03	1.02	2.46	0.92	1.13	2.17	1.86	1.84	1.82	1.23	1.45
Percent of annual flow	1.67	1.82	1.58	1.38	2.16	1.65	1.67	16.62	51.10	15.20	3.49	1.66	[1]0.071

[1]Serial correlation for annual mean flows.

Table E16.3. Serial correlation for 1-year lag for monthly mean flow for station 06408500, Spring Creek near Hermosa (October 1949 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.235	0.132	0.197	0.305	0.077	0.190	0.136	-0.170	0.024	0.047	0.043	0.197

Table E16.4. Correlation matrix for monthly mean flow for station 06408500, Spring Creek near Hermosa (October 1949 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.810	0.916	0.887	0.097	0.745	0.420	-0.054	0.092	0.087	0.138	0.242
Nov.	*	1.000	0.888	0.846	0.159	0.673	0.393	-0.122	0.398	0.133	0.089	0.243
Dec.	*	*	1.000	0.949	0.187	0.710	0.529	-0.123	0.177	0.059	0.059	0.208
Jan.	*	*	*	1.000	0.230	0.726	0.529	-0.092	0.161	0.055	0.062	0.248
Feb.	*	*	*	*	1.000	0.239	0.728	0.435	0.240	0.017	0.000	0.130
Mar.	*	*	*	*	*	1.000	0.566	-0.092	0.006	-0.047	-0.063	0.051
Apr.	*	*	*	*	*	*	1.000	0.262	0.232	0.064	0.079	0.253
May	*	*	*	*	*	*	*	1.000	0.406	0.383	0.440	0.497
June	*	*	*	*	*	*	*	*	1.000	0.688	0.587	0.728
July	*	*	*	*	*	*	*	*	*	1.000	0.910	0.768
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.790
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E16.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06408500, Spring Creek near Hermosa

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1950	0.0000	1	0.0000	1	0.0000	1	0.021	26	0.043	24	0.11	20	0.18	19	0.27	20	0.27	19
1951	.0000	2	.0000	2	.0000	2	.0000	1	.0000	1	.012	18	.048	16	.082	15	.088	12
1952	.10	32	.10	32	.10	32	.10	30	.10	26	1.05	33	1.08	30	1.19	29	1.48	30
1953	.10	33	.10	33	.10	33	.12	32	.16	30	.25	24	.36	26	.43	26	.43	25
1954	.0000	3	.0000	3	.0000	3	.0000	2	.0000	2	.005	17	.046	15	.072	14	.093	13
1955	.0000	4	.0000	4	.0000	4	.0000	3	.0000	3	.0000	1	.0000	1	.0000	1	.002	9
1956	.0000	5	.0000	5	.0000	5	.0000	4	.0000	4	.0000	2	.0000	2	.0000	2	.0000	1
1957	.0000	6	.0000	6	.0000	6	.0000	5	.013	23	1.28	37	1.56	36	1.79	37	1.99	37
1958	.10	34	.10	34	.10	34	.10	31	.14	28	.25	25	.36	27	.42	25	.42	24
1959	.0000	7	.0000	7	.0000	7	.0000	6	.0000	5	.0000	3	.0000	3	.0000	3	.0000	2
1960	.0000	8	.0000	8	.0000	8	.0000	7	.0000	6	.0000	4	.0000	4	.0000	4	.0000	3
1961	.0000	9	.0000	9	.0000	9	.0000	8	.0000	7	.0000	5	.0000	5	.0000	5	.0000	4
1962	.0000	10	.0000	10	.0000	10	.0000	9	.0000	8	1.20	35	1.90	40	2.08	40	2.27	38
1963	1.20	43	1.20	43	1.31	43	1.44	43	1.70	43	1.85	43	2.05	42	2.23	41	2.30	40
1964	.60	42	.60	41	.61	41	.71	41	.86	39	1.04	32	1.25	32	1.32	31	1.67	33
1965	.50	40	.50	40	.50	39	.55	39	.71	36	1.76	42	1.95	41	2.06	39	2.28	39
1966	.0000	11	.0000	11	.0000	11	.057	27	.20	32	.34	29	.52	28	.65	28	.76	27
1967	.47	39	.49	39	.52	40	.61	40	.86	38	.99	31	2.24	43	2.35	42	2.39	41
1968	.0000	12	.0000	12	.0000	12	.0000	10	.0000	9	.055	19	.17	18	.27	21	.35	21
1969	.0000	13	.0000	13	.0000	13	.0000	11	.0000	10	.0000	6	.007	13	.12	16	.18	15
1970	.0000	14	.0000	14	.0000	14	.0000	12	.0000	11	.0000	7	.011	14	.035	13	.18	16
1971	.34	38	.36	38	.45	38	.46	37	1.42	42	1.51	40	1.71	37	2.39	43	2.81	43
1972	.31	37	.31	37	.40	37	.55	38	.86	37	1.15	34	1.33	33	1.46	34	1.74	35
1973	.50	41	.73	42	.89	42	.94	42	1.03	40	1.24	36	1.24	31	1.43	33	1.63	32
1974	.0000	15	.0000	15	.0000	15	.0000	13	.12	27	.18	23	.24	20	.25	18	.27	18
1975	.0000	16	.0000	16	.0000	16	.0000	14	.0000	12	.0000	8	.0000	6	.0000	6	.022	11
1976	.20	36	.25	36	.31	36	.40	35	.65	35	.69	30	1.41	34	1.40	32	1.56	31
1977	.0000	17	.040	30	.059	29	.091	29	.15	29	.31	27	.35	25	.36	22	.36	22
1978	.0000	18	.0000	17	.0000	17	.0000	15	.0000	13	.0000	9	.28	22	.49	27	.84	28
1979	.0000	19	.0000	18	.0000	18	.0000	16	.0000	14	.14	22	.25	21	.26	19	.28	20
1980	.0000	20	.0000	19	.0000	19	.0000	17	.0000	15	.0000	10	.0000	7	.0000	7	.006	10
1981	.0000	21	.0000	20	.0000	20	.0000	18	.0000	16	.0000	11	.0000	8	.0000	8	.0000	5
1982	.0000	22	.0000	21	.0000	21	.0000	19	.0000	17	.0000	12	.85	29	1.31	30	1.29	29
1983	.13	35	.18	35	.27	35	.41	36	.54	34	1.34	39	1.74	38	1.78	36	1.96	36
1984	.010	30	.037	29	.063	30	.19	34	1.28	41	1.67	41	1.85	39	2.05	38	2.46	42
1985	.030	31	.050	31	.067	31	.14	33	.21	33	.31	28	.35	24	.40	23	.39	23
1986	.0000	23	.023	28	.051	28	.071	28	.17	31	.26	26	.35	23	.42	24	.53	26
1987	.0000	24	.0000	22	.0000	22	.0000	20	.0000	18	.0000	13	.0000	9	.028	12	.11	14
1988	.0000	25	.0000	23	.0000	23	.0000	21	.0000	19	.0000	14	.0000	10	.0000	9	.0000	6
1989	.0000	26	.0000	24	.0000	24	.0000	22	.0000	20	.0000	15	.0000	11	.0000	10	.0000	7
1990	.0000	27	.0000	25	.0000	25	.0000	23	.0000	21	.0000	16	.0000	12	.0000	11	.0000	8
1991	.0000	28	.0000	26	.0000	26	.0000	24	.0000	22	1.30	38	1.48	35	1.56	35	1.67	34
1992	.0000	29	.0000	27	.0000	27	.0000	25	.062	25	.12	21	.16	17	.20	17	.20	17

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E16.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06408500, Spring Creek near Hermosa

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1950	11.0	27	7.07	27	3.37	28	2.21	31	2.07	28	1.86	28	1.83	27	1.71	27	1.59	26
1951	2.00	37	1.43	37	.76	39	.63	37	.56	37	.45	37	.41	37	.34	37	.27	37
1952	496	2	416	2	270	2	141	8	77.6	11	46.6	11	31.9	11	24.3	11	16.1	11
1953	82.0	15	35.6	16	16.6	18	8.61	18	5.02	18	2.96	20	2.41	23	2.19	23	1.82	23
1954	49.0	17	29.0	18	14.5	19	6.91	21	3.46	23	1.73	29	1.20	31	.99	31	.86	31
1955	.50	41	.43	41	.40	40	.39	40	.35	39	.28	38	.23	38	.20	38	.18	38
1956	1.30	40	.57	40	.24	42	.15	41	.11	41	.065	41	.062	41	.055	41	.046	41
1957	270	9	203	9	138	11	99.0	12	88.4	9	63.3	8	44.2	9	33.7	9	22.3	9
1958	3.50	34	3.27	31	3.06	30	2.79	27	2.60	26	2.44	24	2.42	22	2.34	22	1.98	22
1959	1.50	39	1.00	39	.91	37	.81	36	.68	36	.66	36	.58	36	.51	36	.47	35
1960	4.00	33	2.00	36	1.24	36	.63	38	.32	40	.18	40	.13	40	.10	40	.067	40
1961	.30	43	.10	43	.043	43	.020	43	.010	43	.005	43	.003	43	.002	43	.002	43
1962	292	6	266	6	226	5	164	5	126	4	86.4	4	58.8	6	44.8	6	29.6	6
1963	171	12	164	12	154	10	130	10	98.6	8	62.4	9	45.8	8	36.2	7	24.6	7
1964	33.0	21	30.0	17	21.0	16	18.3	16	15.7	15	8.87	16	6.34	16	5.08	16	3.84	16
1965	285	8	271	5	241	4	186	3	141	3	121	2	95.0	2	72.9	2	48.4	2
1966	18.0	25	7.83	26	3.97	26	2.83	26	2.76	24	2.68	22	2.58	20	2.42	21	2.27	20
1967	443	3	247	8	192	8	146	6	115	6	67.5	7	45.9	7	34.9	8	23.2	8
1968	20.0	24	12.3	24	6.63	24	3.88	24	2.76	25	2.59	23	2.57	21	2.49	19	2.43	18
1969	248	10	189	11	91.7	14	51.1	14	25.6	14	13.0	14	8.77	15	6.95	15	4.79	15
1970	5.00	31	4.70	28	3.76	27	2.49	29	1.38	33	.96	33	.70	34	.58	34	.49	34
1971	248	11	196	10	169	9	141	7	111	7	86.1	5	61.8	4	46.9	4	34.1	3
1972	3,300	1	1,633	1	859	1	506	1	288	1	153	1	103	1	78.2	1	51.8	1
1973	56.0	16	41.3	15	25.3	15	19.2	15	15.0	16	11.6	15	8.96	14	7.47	14	5.74	14
1974	3.20	35	2.53	34	2.49	31	2.43	30	2.36	27	2.18	26	2.03	25	1.83	26	1.63	25
1975	5.80	28	2.67	33	2.21	33	1.43	34	.90	35	.70	35	.60	35	.55	35	.44	36
1976	342	5	294	4	212	7	136	9	77.2	12	40.1	12	27.2	12	20.7	12	13.8	12
1977	37.0	19	17.2	20	7.77	23	5.11	23	3.62	22	2.72	21	2.64	19	2.45	20	2.24	21
1978	165	13	149	13	136	12	110	11	85.4	10	50.6	10	34.7	10	26.5	10	17.8	10
1979	5.00	32	4.00	29	3.36	29	2.66	28	1.92	30	1.58	30	1.39	29	1.19	30	1.10	28
1980	32.0	22	27.3	19	16.8	17	9.04	17	4.55	20	2.44	25	1.80	28	1.43	28	1.01	29
1981	1.60	38	1.21	38	.80	38	.57	39	.39	38	.20	39	.16	39	.13	39	.090	39
1982	43.0	18	16.7	21	11.5	20	7.49	20	4.82	19	3.31	18	2.39	24	1.96	24	1.29	27
1983	37.0	20	13.3	22	9.76	21	7.84	19	5.03	17	3.44	17	3.57	17	2.97	17	2.41	19
1984	136	14	135	14	103	13	75.1	13	45.6	13	25.8	13	18.2	13	14.5	13	10.2	13
1985	13.0	26	11.7	25	9.67	22	6.54	22	4.31	21	3.17	19	2.78	18	2.53	18	2.72	17
1986	5.10	30	3.60	30	2.27	32	1.94	33	1.62	32	1.40	31	1.27	30	1.23	29	1.01	30
1987	5.20	29	2.97	32	1.73	35	1.12	35	.99	34	.80	34	.80	33	.78	33	.74	32
1988	23.0	23	12.7	23	6.43	25	3.42	25	1.90	31	1.23	32	.99	32	.84	32	.65	33
1989	.35	42	.28	42	.26	41	.14	42	.072	42	.036	42	.024	42	.018	42	.012	42
1990	.000	44	.000	44	.000	44	.000	44	.000	44	.000	44	.000	44	.000	44	.000	44
1991	357	4	311	3	259	3	206	2	150	2	89.7	3	60.9	5	46.2	5	30.4	5
1992	2.20	36	2.10	35	2.09	34	2.04	32	2.00	29	1.91	27	1.86	26	1.85	25	1.67	24
1993	286	7	258	7	214	6	168	4	118	5	79.8	6	63.1	3	49.7	3	33.5	4

Table E17.1. Mean flow, in cubic feet per second, for station 06408700, Rhoads Fork near Rochford

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1982	(1)	4.94	4.25	3.72	4.03	4.12	4.51	4.67	5.10	5.17	6.11	6.36	(2)
1983	5.87	5.46	5.96	5.57	5.04	4.77	5.02	6.17	5.86	6.52	6.67	6.33	5.78
1984	7.74	7.43	6.50	6.54	7.22	6.90	6.97	7.15	6.72	6.88	6.90	6.49	6.95
1985	6.13	6.67	6.59	6.33	6.36	7.27	6.88	6.50	6.57	6.35	5.69	5.86	6.43
1986	5.97	5.85	5.66	5.27	5.12	5.35	5.40	5.64	5.98	5.30	5.11	5.28	5.49
1987	5.28	5.13	4.98	4.95	4.88	4.88	4.88	4.85	5.00	5.24	5.38	5.58	5.09
1988	5.40	5.22	4.76	4.95	5.06	5.06	5.05	5.33	5.66	5.29	5.01	5.15	5.16
1989	5.29	5.14	4.57	4.36	4.30	4.25	4.28	4.28	4.30	4.37	4.37	4.35	4.49
1990	4.35	4.16	3.83	3.65	3.78	3.98	4.05	4.04	3.97	4.27	4.14	4.01	4.02
1991	3.66	3.42	3.30	3.25	3.58	3.81	4.07	3.98	3.87	3.83	3.75	3.83	3.69
1992	3.83	3.61	3.59	3.66	3.73	3.60	3.78	3.92	3.79	3.82	3.74	3.78	3.74
1993	3.84	3.81	3.75	3.76	3.57	3.60	3.77	4.08	4.60	4.49	4.32	4.28	3.99

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E17.2. Statistics on mean flow, in cubic feet per second, for station 06408700, Rhoads Fork near Rochford (October 1982 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	11	11	11	11	11	11	11	11	11	11	11	11	11
Maximum	7.74	7.43	6.59	6.54	7.22	7.27	6.97	7.15	6.72	6.88	6.90	6.49	6.95
Percentile													
75th	5.97	5.85	5.96	5.57	5.12	5.35	5.40	6.17	5.98	6.35	5.69	5.86	3.99
50th	5.29	5.14	4.76	4.95	4.88	4.77	4.88	4.85	5.00	5.24	5.01	5.15	5.09
25th	3.84	3.81	3.75	3.66	3.73	3.81	4.05	4.04	3.97	4.27	4.14	4.01	5.78
Minimum	3.66	3.42	3.30	3.25	3.57	3.60	3.77	3.92	3.79	3.82	3.74	3.78	3.69
Mean	5.21	5.08	4.86	4.75	4.79	4.86	4.92	5.09	5.12	5.12	5.01	4.99	4.98
Standard deviation	1.23	1.27	1.18	1.12	1.18	1.25	1.13	1.15	1.09	1.08	1.09	1.00	1.11
Skewness	0.52	0.41	0.22	0.28	0.93	1.03	0.98	0.60	0.17	0.42	0.62	0.20	0.46
Coefficient of variation	0.24	0.25	0.24	0.24	0.25	0.26	0.23	0.23	0.21	0.21	0.22	0.20	0.22
Percent of annual flow	8.72	8.50	8.13	7.95	8.00	8.13	8.23	8.50	8.56	8.57	8.37	8.35	[1]0.859

[1]Serial correlation for annual mean flows.

Table E17.3. Serial correlation for 1-year lag for monthly mean flow for station 06408700, Rhoads Fork near Rochford (October 1982 through September 1993)

Month												
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.729	0.772	0.914	0.868	0.702	0.688	0.717	0.844	0.782	0.878	0.884	0.908

Table E17.4. Correlation matrix for monthly mean flow for station 06408700, Rhoads Fork near Rochford (October 1982 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.981	0.933	0.947	0.954	0.876	0.902	0.933	0.895	0.901	0.892	0.894
Nov.	*	1.000	0.959	0.970	0.972	0.939	0.949	0.937	0.922	0.900	0.858	0.880
Dec.	*	*	1.000	0.988	0.930	0.912	0.924	0.961	0.948	0.951	0.908	0.938
Jan.	*	*	*	1.000	0.966	0.935	0.946	0.973	0.963	0.960	0.915	0.946
Feb.	*	*	*	*	1.000	0.964	0.980	0.957	0.924	0.909	0.861	0.882
Mar.	*	*	*	*	*	1.000	0.994	0.914	0.908	0.853	0.761	0.810
Apr.	*	*	*	*	*	*	1.000	0.944	0.924	0.881	0.805	0.841
May	*	*	*	*	*	*	*	1.000	0.968	0.972	0.932	0.942
June	*	*	*	*	*	*	*	*	1.000	0.946	0.883	0.921
July	*	*	*	*	*	*	*	*	*	1.000	0.979	0.980
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.984
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E17.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06408700, Rhoads Fork near Rochford

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1982	4.40	6	4.40	6	4.40	6	4.42	6	4.51	6	4.59	6	4.75	6	4.85	6	5.32	8
1983	4.70	9	4.73	9	4.80	9	4.84	9	5.02	9	5.60	10	5.68	10	5.89	10	6.10	10
1984	5.80	11	5.87	11	5.91	11	5.96	11	6.10	11	6.30	11	6.41	11	6.44	11	6.42	11
1985	5.00	10	5.00	10	5.03	10	5.06	10	5.12	10	5.19	9	5.25	9	5.35	9	5.54	9
1986	4.50	7	4.53	7	4.57	7	4.63	7	4.84	8	4.88	8	4.90	7	4.92	7	5.02	6
1987	4.60	8	4.60	8	4.60	8	4.64	8	4.71	7	4.82	7	4.90	8	4.94	8	5.07	7
1988	4.20	5	4.20	5	4.20	5	4.21	5	4.25	5	4.27	5	4.31	5	4.37	5	4.66	5
1989	3.50	4	3.50	4	3.50	4	3.56	4	3.64	4	3.69	4	3.75	4	3.80	4	3.96	4
1990	3.10	1	3.10	1	3.14	1	3.18	1	3.24	1	3.27	1	3.32	1	3.37	1	3.50	1
1991	3.30	2	3.30	2	3.36	2	3.44	2	3.55	3	3.60	3	3.62	2	3.64	2	3.67	2
1992	3.40	3	3.40	3	3.40	3	3.45	3	3.50	2	3.57	2	3.64	3	3.67	3	3.72	3

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E17.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06408700, Rhoads Fork near Rochford

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1983	7.10	4	6.97	4	6.93	4	6.81	3	6.72	3	6.61	3	6.50	3	6.35	3	6.10	3
1984	8.40	2	8.40	1	8.33	1	8.13	1	7.77	1	7.60	1	7.25	1	7.07	1	7.05	1
1985	8.50	1	8.33	2	7.74	2	7.43	2	7.30	2	7.10	2	6.93	2	6.83	2	6.69	2
1986	7.60	3	7.53	3	7.24	3	6.39	4	6.01	4	5.91	4	5.84	4	5.70	4	5.54	4
1987	5.70	6	5.70	6	5.70	6	5.63	6	5.58	6	5.48	6	5.40	6	5.30	6	5.16	6
1988	6.40	5	6.10	5	6.07	5	5.86	5	5.72	5	5.55	5	5.44	5	5.34	5	5.25	5
1989	5.50	7	5.50	7	5.50	7	5.45	7	5.44	7	5.22	7	5.01	7	4.85	7	4.65	7
1990	5.50	8	5.33	8	5.04	8	4.57	9	4.38	9	4.26	9	4.15	9	4.12	9	4.09	9
1991	4.30	10	4.27	10	4.19	10	4.13	10	4.08	10	4.03	10	3.99	10	3.96	10	3.90	10
1992	4.30	11	4.20	11	4.04	11	3.98	11	3.93	11	3.87	11	3.85	11	3.83	11	3.80	11
1993	5.20	9	5.17	9	5.03	9	4.87	8	4.66	8	4.57	8	4.48	8	4.43	8	4.26	8

Table E18.1. Mean flow, in cubic feet per second, for station 06409000, Castle Creek above Deerfield Reservoir, near Hill City

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1948	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	9.26	8.52	8.47	(2)
1949	9.15	10.7	10.6	7.71	8.04	8.14	13.1	11.9	13.1	8.46	6.45	7.79	9.59
1950	8.06	7.85	6.16	6.44	6.01	7.16	18.7	15.5	9.84	7.87	7.98	8.32	9.17
1951	8.43	8.76	7.95	6.08	6.44	7.11	12.8	11.4	10.7	9.07	7.90	8.41	8.75
1952	8.36	8.03	7.13	5.84	6.97	7.03	15.0	30.5	16.9	10.4	8.25	7.63	11.0
1953	8.19	7.47	7.81	6.81	6.61	8.39	11.4	16.4	11.5	7.47	8.59	7.10	8.99
1954	7.68	7.46	7.73	7.37	7.48	8.76	12.1	8.33	7.47	5.60	6.57	6.78	7.77
1955	7.01	7.93	7.60	6.31	6.48	5.82	18.8	12.1	10.8	7.74	7.72	7.10	8.77
1956	6.84	5.93	6.42	5.74	5.79	6.69	11.9	13.3	8.74	7.29	6.48	5.98	7.60
1957	6.55	6.70	7.06	6.81	6.54	6.39	9.30	11.5	10.3	7.79	7.13	6.70	7.73
1958	6.17	5.46	6.40	6.10	6.83	7.26	10.2	10.2	7.55	7.74	5.91	5.04	7.08
1959	5.90	6.35	5.47	4.94	5.49	6.15	10.8	11.2	7.68	7.17	5.25	5.74	6.84
1960	6.37	6.10	6.45	5.19	5.85	10.5	9.59	7.45	6.24	4.60	4.63	4.42	6.45
1961	3.93	5.04	5.32	4.47	5.22	5.81	6.83	6.56	4.69	4.05	5.33	4.36	5.13
1962	4.10	3.85	2.74	3.98	5.06	6.03	11.9	11.8	12.2	7.56	5.95	5.13	6.69
1963	5.99	5.61	5.32	4.39	5.27	8.74	15.4	14.3	27.0	12.4	8.42	9.93	10.2
1964	8.75	8.42	6.76	7.48	6.82	6.48	15.3	16.8	21.0	14.0	11.0	9.96	11.1
1965	10.5	8.42	8.68	8.48	8.11	7.98	17.1	31.9	34.8	25.4	20.5	17.2	16.6
1966	16.6	14.9	12.4	11.2	11.5	15.7	21.2	18.0	11.8	12.9	14.0	12.5	14.4
1967	13.5	13.2	10.3	10.1	10.3	14.9	16.9	19.0	19.5	14.7	11.6	13.5	14.0
1968	12.6	12.1	11.0	11.5	10.1	13.3	13.5	12.5	12.2	10.5	8.80	10.0	11.5
1969	9.34	9.41	9.28	9.63	9.18	9.94	14.5	16.1	11.8	14.6	10.8	8.57	11.1
1970	11.0	10.0	9.94	8.71	8.48	9.07	16.2	28.0	15.6	11.1	11.2	11.0	12.6
1971	11.0	10.1	10.3	9.48	10.1	10.5	23.7	19.5	14.4	11.6	11.2	11.6	12.8
1972	12.3	11.5	12.0	10.8	9.50	14.6	16.1	16.3	12.7	11.4	11.8	11.3	12.5
1973	11.6	9.29	8.09	9.54	9.21	9.90	16.2	18.4	16.0	12.4	11.2	11.8	12.0
1974	11.6	10.3	8.61	8.76	8.67	12.9	13.7	11.5	8.60	8.90	9.26	8.37	10.1
1975	9.03	10.2	10.8	8.49	8.12	7.89	19.8	19.9	13.7	9.80	8.44	9.02	11.3
1976	9.50	8.58	9.14	8.39	8.54	9.60	12.5	10.4	13.3	10.4	9.06	8.84	9.85
1977	8.37	8.49	8.32	7.84	10.1	11.9	17.6	15.8	11.0	9.54	9.51	9.25	10.6
1978	10.8	8.56	8.19	9.11	9.73	11.7	13.7	30.8	22.5	16.4	12.9	12.6	13.9
1979	13.3	11.6	9.68	10.1	12.1	14.2	16.7	14.8	13.0	13.6	12.5	11.1	12.7
1980	9.94	10.7	6.88	8.70	9.60	10.8	16.7	15.9	11.4	8.54	9.27	9.42	10.6
1981	9.26	9.76	8.82	9.47	8.07	9.06	10.5	10.5	8.16	8.07	8.12	7.58	8.96
1982	8.12	7.21	6.85	6.37	6.66	8.04	12.2	14.7	14.6	10.9	11.5	10.1	9.78
1983	13.4	12.2	11.4	12.0	10.8	15.9	21.0	22.8	18.8	14.4	14.7	13.5	15.1
1984	13.5	11.9	10.1	10.9	11.5	13.2	17.0	29.3	22.0	33.9	15.7	13.3	16.9
1985	12.4	11.8	10.7	9.24	9.50	12.8	14.1	12.6	11.0	8.86	9.23	10.4	11.1
1986	11.9	10.8	11.0	11.3	11.0	15.0	17.3	18.3	15.6	12.1	11.0	11.7	13.1
1987	13.3	11.5	11.5	9.28	10.2	13.6	16.6	14.2	11.2	9.62	8.66	9.05	11.6
1988	10.7	10.9	10.9	8.97	9.56	11.2	15.3	15.1	11.2	10.3	9.35	8.52	11.0
1989	8.56	8.38	9.05	8.76	8.01	11.4	11.4	12.2	9.51	7.80	7.77	8.15	9.26
1990	8.51	8.75	7.72	9.19	8.68	9.54	15.5	13.7	9.80	8.41	7.69	7.20	9.56
1991	8.34	7.74	5.78	5.26	6.74	7.98	12.9	19.7	25.5	11.7	10.5	9.29	11.0
1992	9.65	9.70	9.74	9.58	9.52	11.3	11.8	11.0	10.5	11.2	9.59	9.52	10.3
1993	8.47	8.24	8.04	8.25	7.93	9.95	12.7	18.4	28.6	18.8	14.4	12.3	13.0

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E18.2. Statistics on mean flow, in cubic feet per second, for station 06409000, Castle Creek above Deerfield Reservoir, near Hill City (October 1948 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	45	45	45	45	45	45	45	45	45	45	45	45	45
Maximum	16.6	14.9	12.4	12.0	12.1	15.9	23.7	31.9	34.8	33.9	20.5	17.2	16.9
Percentile													
75th	11.6	10.7	10.3	9.51	9.66	12.3	16.8	18.4	15.8	12.4	11.2	11.2	12.5
50th	9.15	8.75	8.32	8.49	8.12	9.60	14.5	14.8	11.8	10.3	9.23	9.05	10.6
25th	8.09	7.60	6.86	6.34	6.63	7.57	12.0	11.6	10.1	7.84	7.74	7.39	8.97
Minimum	3.93	3.85	2.74	3.98	5.06	5.81	6.83	6.56	4.69	4.05	4.63	4.36	5.13
Mean	9.52	9.06	8.49	8.11	8.28	10.01	14.61	16.01	13.88	11.05	9.64	9.27	10.67
Standard deviation	2.71	2.33	2.12	2.08	1.89	2.94	3.45	6.14	6.28	5.12	3.09	2.71	2.62
Skewness	0.22	0.07	-0.27	-0.20	0.06	0.41	0.32	1.18	1.45	2.55	1.11	0.41	0.27
Coefficient of variation	0.28	0.26	0.25	0.26	0.23	0.29	0.24	0.38	0.45	0.46	0.32	0.29	0.25
Percent of annual flow	7.44	7.09	6.64	6.34	6.47	7.82	11.42	12.52	10.85	8.63	7.54	7.24	[1]0.684

[1]Serial correlation for annual mean flows.

Table E18.3. Serial correlation for 1-year lag for monthly mean flow for station 06409000, Castle Creek above Deerfield Reservoir, near Hill City (October 1948 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.743	0.678	0.574	0.648	0.705	0.537	0.286	0.143	0.185	0.280	0.613	0.671

Table E18.4. Correlation matrix for monthly mean flow for station 06409000, Castle Creek above Deerfield Reservoir, near Hill City (October 1948 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.946	0.851	0.886	0.897	0.852	0.615	0.426	0.227	0.487	0.650	0.741
Nov.	*	1.000	0.895	0.881	0.875	0.807	0.606	0.302	0.108	0.372	0.518	0.635
Dec.	*	*	1.000	0.873	0.822	0.757	0.519	0.251	0.046	0.304	0.457	0.562
Jan.	*	*	*	1.000	0.923	0.830	0.528	0.322	0.127	0.446	0.591	0.668
Feb.	*	*	*	*	1.000	0.872	0.578	0.359	0.141	0.473	0.588	0.661
Mar.	*	*	*	*	*	1.000	0.446	0.197	0.089	0.330	0.474	0.576
Apr.	*	*	*	*	*	*	1.000	0.513	0.319	0.379	0.538	0.626
May	*	*	*	*	*	*	*	1.000	0.714	0.719	0.737	0.710
June	*	*	*	*	*	*	*	*	1.000	0.753	0.752	0.742
July	*	*	*	*	*	*	*	*	*	1.000	0.850	0.781
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.939
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E18.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06409000, Castle Creek above Deerfield Reservoir, near Hill City

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1949	5.00	16	5.00	13	5.00	9	5.43	12	5.80	11	6.04	9	6.19	10	6.44	11	6.96	11
1950	4.50	10	4.67	10	5.29	13	5.54	13	5.98	13	6.08	11	6.35	12	6.84	14	7.42	15
1951	4.00	5	4.00	4	4.43	5	5.14	8	5.83	12	6.17	13	6.49	13	6.69	12	7.23	13
1952	6.00	26	6.00	20	6.00	17	6.29	17	6.40	15	6.58	15	6.86	15	6.97	16	7.35	14
1953	4.50	11	5.67	17	6.00	18	6.46	19	7.03	18	7.24	17	7.42	17	7.40	17	7.43	16
1954	4.90	15	4.97	12	5.03	12	5.21	9	5.55	9	6.05	10	6.18	9	6.38	9	6.78	9
1955	4.00	6	4.00	5	4.43	6	4.71	5	5.23	7	5.34	5	5.79	6	5.80	5	6.15	6
1956	4.00	7	4.33	8	5.00	10	5.36	11	5.57	10	6.12	12	6.29	11	6.40	10	6.54	8
1957	4.80	13	5.00	14	5.00	11	5.21	10	5.37	8	5.78	8	5.97	8	6.04	7	6.26	7
1958	4.50	12	4.50	9	4.57	8	4.68	4	4.82	4	5.02	4	5.19	4	5.37	4	5.49	4
1959	4.00	8	4.17	6	4.49	7	4.80	7	4.92	5	5.38	6	5.71	5	5.83	6	5.84	5
1960	3.50	3	3.50	3	3.50	2	3.61	2	3.91	2	4.16	2	4.32	2	4.36	2	4.62	2
1961	2.00	1	2.03	1	2.16	1	2.21	1	2.64	1	3.27	1	3.40	1	3.59	1	3.98	1
1962	3.00	2	3.33	2	3.71	3	3.82	3	4.23	3	4.72	3	4.90	3	5.08	3	5.27	3
1963	5.50	22	5.83	19	6.07	19	6.21	16	6.40	16	6.63	16	6.92	16	6.87	15	7.45	17
1964	5.00	17	5.67	18	6.57	22	6.71	21	7.87	25	8.02	21	8.19	23	8.20	20	8.71	22
1965	7.50	39	7.83	39	8.50	40	9.25	43	10.5	44	11.0	44	11.3	44	12.2	44	13.6	44
1966	7.00	34	7.33	34	7.71	32	9.07	41	9.65	40	9.93	39	10.1	37	10.7	38	11.5	39
1967	8.00	41	8.50	43	8.89	44	9.06	40	9.90	41	10.7	43	10.7	40	11.2	43	11.6	41
1968	6.00	27	7.17	33	7.86	36	8.40	34	8.73	34	9.20	34	9.20	32	9.29	31	9.40	27
1969	5.80	25	6.90	30	7.64	30	7.86	29	8.34	30	8.51	29	8.64	28	8.99	29	9.43	28
1970	6.00	28	7.00	31	7.71	33	8.46	35	9.30	37	9.52	36	9.81	36	9.89	35	10.3	34
1971	7.00	35	7.67	37	8.64	42	8.66	37	9.35	38	10.1	40	10.7	41	10.9	40	11.2	37
1972	3.50	4	6.00	21	6.21	20	6.55	20	7.49	19	8.10	24	8.80	30	8.76	26	9.56	31
1973	7.40	38	7.60	36	7.67	31	7.74	28	8.10	28	8.42	28	8.57	27	9.06	30	9.94	33
1974	5.60	23	6.20	22	6.31	21	6.78	22	7.60	22	8.00	20	8.17	22	8.60	24	9.04	24
1975	5.00	18	6.73	28	7.07	27	7.32	26	8.27	29	8.39	27	8.49	25	8.53	22	8.81	23
1976	7.00	36	7.00	32	7.00	26	7.32	27	7.75	23	8.02	22	8.16	21	8.26	21	8.45	20
1977	6.20	31	6.40	25	6.57	23	7.14	24	7.53	21	8.26	25	8.54	26	8.85	27	9.19	26
1978	6.90	33	8.50	44	8.86	43	9.21	42	9.47	39	9.85	38	10.2	38	10.8	39	11.5	40
1979	4.80	14	4.93	11	5.47	14	6.09	15	6.77	17	7.66	18	8.12	20	8.75	25	9.43	29
1980	6.00	29	6.27	23	6.69	24	7.31	25	8.05	27	8.53	30	8.78	29	8.85	28	9.07	25
1981	5.00	19	5.30	16	5.67	15	5.81	14	6.22	14	6.50	14	6.59	14	6.76	13	7.14	12
1982	5.60	24	6.40	26	8.51	41	9.37	44	9.93	42	10.2	41	10.7	42	11.1	42	11.6	42
1983	8.00	42	8.00	40	8.14	37	8.77	39	9.98	43	10.4	42	10.7	43	10.9	41	11.7	43
1984	6.00	30	6.33	24	7.07	28	7.89	31	8.45	31	9.17	33	9.60	35	10.1	36	11.0	36
1985	7.50	40	7.70	38	7.79	35	8.14	33	8.61	33	9.01	32	9.45	34	9.84	34	10.3	35
1986	8.00	43	8.30	42	8.44	39	8.74	38	9.06	36	9.74	37	10.3	39	10.5	37	11.3	38
1987	8.00	44	8.17	41	8.41	38	8.46	36	8.59	32	8.79	31	9.08	31	9.34	32	9.86	32
1988	7.00	37	7.33	35	7.71	34	7.86	30	7.98	26	8.32	26	8.48	24	8.54	23	8.55	21
1989	5.00	20	5.17	15	5.86	16	6.43	18	7.50	20	7.73	19	7.89	18	8.04	18	8.10	18
1990	4.00	9	4.17	7	4.31	4	4.77	6	5.16	6	5.40	7	5.90	7	6.30	8	6.83	10
1991	6.50	32	6.83	29	7.14	29	7.89	32	8.96	35	9.31	35	9.32	33	9.47	33	9.49	30
1992	5.40	21	6.60	27	6.86	25	7.06	23	7.77	24	8.09	23	8.08	19	8.12	19	8.30	19

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E18.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06409000, Castle Creek above Deerfield Reservoir, near Hill City

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1949	28.0	21	20.3	29	16.4	34	14.8	35	13.6	34	13.0	32	12.7	32	11.8	32	10.4	34
1950	46.0	10	37.3	10	29.1	11	25.3	12	20.4	14	17.5	17	14.8	22	13.1	25	11.4	27
1951	22.0	30	18.0	35	14.4	38	13.9	36	13.2	36	12.2	35	11.6	37	11.1	36	10.1	36
1952	232	1	119	1	72.6	1	48.6	2	33.5	3	24.9	4	21.2	5	18.4	6	14.8	13
1953	20.0	33	19.0	31	18.1	28	17.3	24	16.8	22	14.8	26	13.3	27	12.1	30	10.7	32
1954	17.0	40	16.0	38	14.7	37	13.5	38	12.1	39	10.7	41	9.92	41	9.25	42	8.70	41
1955	40.0	12	34.0	13	26.9	13	24.1	13	19.6	18	15.5	22	13.9	26	12.4	28	10.7	33
1956	22.0	31	17.7	36	14.9	36	13.9	37	13.4	35	12.9	33	11.8	35	10.6	38	9.21	39
1957	20.0	34	15.7	39	13.6	39	12.1	42	11.5	43	11.3	39	10.4	39	9.78	39	8.85	40
1958	14.0	43	13.3	43	12.9	42	12.1	43	11.6	42	10.3	44	9.43	43	9.02	43	8.31	42
1959	16.0	41	13.7	42	12.9	43	12.4	41	12.0	40	11.1	40	9.92	42	9.33	41	8.14	43
1960	32.0	17	26.7	16	21.0	22	15.5	32	12.6	37	10.4	43	9.24	44	8.54	44	7.52	44
1961	9.40	45	8.00	45	7.81	45	7.38	45	7.15	45	6.74	45	6.44	45	6.13	45	5.70	45
1962	33.0	15	29.0	14	20.7	24	16.5	30	14.7	29	12.9	34	12.0	34	10.9	37	9.26	38
1963	52.0	8	44.3	7	37.9	8	32.2	8	27.5	8	20.8	10	19.0	10	17.8	9	14.9	11
1964	53.0	7	36.3	11	29.1	12	25.8	11	22.4	12	18.8	14	18.4	13	16.8	13	14.7	14
1965	89.0	3	68.7	3	50.6	3	43.4	3	38.2	1	35.1	1	31.5	1	28.5	1	24.5	1
1966	28.0	22	26.7	17	25.1	15	23.3	15	21.9	13	20.4	11	18.7	11	17.0	12	15.7	7
1967	33.0	16	28.7	15	25.6	14	22.8	16	20.1	16	19.7	13	18.7	12	18.3	7	16.3	6
1968	22.0	32	19.0	32	17.3	32	15.5	33	14.7	30	13.6	30	13.3	28	12.9	26	12.2	23
1969	32.0	18	25.0	19	22.9	18	19.4	21	16.8	23	15.4	23	14.4	23	14.3	19	13.0	19
1970	56.0	6	43.0	8	39.3	6	34.3	7	30.5	5	24.2	5	20.2	7	18.0	8	15.5	8
1971	40.0	13	35.7	12	33.7	10	30.6	9	26.5	9	22.3	8	19.4	9	17.4	11	15.3	9
1972	24.0	27	21.7	27	19.4	25	17.9	23	16.7	24	16.2	20	15.9	17	15.1	17	13.9	17
1973	26.0	24	24.3	22	22.9	19	21.3	18	20.4	15	18.4	15	17.2	16	15.9	15	14.4	15
1974	20.0	35	19.7	30	17.3	33	14.9	34	14.5	31	13.6	31	12.8	31	11.9	31	10.8	31
1975	43.0	11	40.0	9	34.3	9	27.6	10	24.5	10	20.2	12	18.0	14	15.9	16	13.4	18
1976	34.0	14	25.0	20	19.4	26	17.1	27	14.3	32	12.0	36	12.1	33	11.8	33	10.9	30
1977	23.0	29	22.7	25	21.3	21	20.4	19	18.9	20	16.9	18	15.3	18	14.2	20	12.7	20
1978	52.0	9	46.3	6	40.3	5	36.3	4	33.2	4	26.9	3	23.6	3	21.1	3	18.3	3
1979	24.0	28	24.0	23	21.7	20	19.2	22	17.4	21	15.9	21	15.3	19	14.7	18	14.2	16
1980	25.0	26	25.0	21	23.9	17	22.1	17	19.8	17	16.5	19	14.9	20	13.9	22	12.2	24
1981	13.0	44	12.0	44	11.1	44	10.8	44	10.6	44	10.6	42	10.1	40	9.76	40	9.45	37
1982	27.0	23	21.0	28	18.1	29	16.8	28	16.1	26	14.7	27	14.1	25	13.5	23	12.3	22
1983	29.0	20	26.7	18	24.6	16	24.1	14	23.7	11	22.0	9	21.1	6	20.0	5	18.0	4
1984	95.0	2	91.3	2	67.7	2	50.3	1	35.6	2	28.6	2	28.8	2	26.2	2	22.1	2
1985	20.0	36	17.7	37	16.4	35	15.6	31	14.3	33	14.0	29	13.3	29	12.7	27	11.6	26
1986	26.0	25	22.7	26	20.9	23	20.1	20	19.6	19	18.2	16	17.6	15	16.6	14	15.0	10
1987	19.0	38	18.7	33	17.7	31	17.2	26	16.7	25	15.4	24	14.9	21	14.0	21	12.7	21
1988	31.0	19	24.0	24	19.4	27	17.3	25	15.3	28	15.2	25	14.2	24	13.3	24	12.2	25
1989	16.0	42	14.3	41	13.4	41	13.0	39	12.6	38	12.0	37	11.8	36	11.2	34	10.3	35
1990	20.0	37	18.3	34	17.9	30	16.7	29	15.6	27	14.6	28	13.3	30	12.2	29	11.1	28
1991	62.0	5	51.3	4	43.9	4	35.2	5	28.5	7	22.7	7	19.5	8	17.5	10	14.9	12
1992	18.0	39	14.7	40	13.6	40	12.6	40	11.9	41	11.6	38	11.4	38	11.2	35	11.0	29
1993	71.0	4	51.0	5	39.0	7	34.5	6	29.0	6	24.1	6	22.0	4	20.1	4	17.6	5

Table E19.1. Mean flow, in cubic feet per second, for station 06410000, Castle Creek below Deerfield Dam

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.63	0.33	(2)
[3]1947	0.20	0.26	0.22	1.78	2.61	3.14	3.45	11.4	37.1	24.3	12.5	9.89	8.91
1948	3.81	2.58	2.72	3.05	3.06	8.29	23.4	15.5	8.37	12.0	9.42	8.00	8.36
1949	14.2	7.69	1.95	1.90	1.95	2.13	19.9	9.21	13.2	10.3	16.1	12.0	9.23
1950	10.2	4.74	1.90	1.90	1.98	2.07	16.4	21.2	13.9	28.9	9.42	12.5	10.5
1951	4.77	2.37	2.02	1.98	2.00	1.93	1.93	12.0	6.65	5.53	17.0	10.2	5.73
1952	3.28	2.50	2.50	2.50	2.46	4.62	16.5	33.0	15.8	20.2	21.8	20.0	12.1
1953	12.8	3.47	1.99	2.00	2.05	2.17	2.39	12.8	14.6	12.7	13.8	13.6	7.91
1954	8.07	2.21	2.16	2.21	2.22	5.22	11.1	19.1	17.4	38.5	28.9	17.5	13.0
1955	4.52	2.40	2.40	2.35	2.30	2.39	2.80	18.1	10.3	25.0	27.8	21.1	10.2
1956	3.53	2.24	2.06	2.43	3.03	3.05	2.79	6.40	25.3	30.6	24.6	10.0	9.71
1957	15.5	3.07	2.34	2.32	2.31	2.40	2.52	2.73	2.39	2.60	16.5	7.72	5.24
1958	1.85	2.00	2.06	2.04	2.12	2.17	2.21	13.9	21.3	14.0	23.0	25.1	9.33
1959	12.2	4.28	1.92	2.05	2.10	2.06	10.9	19.2	24.7	35.2	60.2	64.2	20.0
1960	2.85	.017	1.25	1.62	1.72	1.56	1.59	1.59	3.08	6.25	4.92	4.87	2.62
1961	20.6	1.70	1.52	1.71	2.12	2.19	1.85	1.68	6.12	6.13	6.06	5.20	4.77
1962	2.39	2.00	2.09	1.93	1.77	1.79	1.79	7.49	2.39	2.13	3.78	4.37	2.84
1963	2.39	2.17	2.19	2.02	2.11	2.26	2.00	2.17	9.17	8.29	7.66	7.65	4.18
1964	2.37	2.38	2.18	2.34	2.32	2.17	13.2	21.2	26.5	18.4	22.2	23.9	11.6
1965	12.8	2.20	2.47	2.34	2.13	1.99	21.2	41.9	50.0	27.0	22.2	32.0	18.2
1966	40.0	2.58	2.46	2.81	4.48	15.3	24.2	23.9	15.4	12.6	15.3	47.8	17.3
1967	9.40	2.33	1.89	2.19	2.35	10.9	23.1	21.6	26.5	19.6	27.0	33.4	15.1
1968	4.93	2.71	2.55	1.93	1.75	12.0	15.9	14.3	15.0	11.0	10.4	26.6	9.92
1969	18.5	2.16	2.02	2.04	2.10	4.91	18.4	19.8	11.8	15.2	22.0	37.7	13.1
1970	2.21	1.89	1.92	2.06	2.21	2.35	18.3	36.1	17.4	11.5	25.7	28.4	12.5
1971	2.15	1.88	2.13	2.14	1.26	6.28	33.7	24.7	18.2	9.68	13.2	34.2	12.5
1972	33.6	2.03	1.98	2.36	2.25	14.1	15.7	13.3	14.0	6.75	15.9	33.9	13.0
1973	25.1	2.43	2.34	2.40	2.48	2.31	11.5	24.7	16.1	14.8	20.6	24.8	12.5
1974	16.5	2.36	2.30	2.32	2.50	2.48	13.9	17.0	12.3	8.22	12.6	10.1	8.59
1975	11.0	3.02	2.38	2.66	2.59	4.76	24.6	27.5	14.6	12.2	8.74	14.5	10.7
1976	10.7	2.55	2.41	2.32	2.67	9.45	16.7	14.8	15.0	12.4	8.91	15.7	9.47
1977	25.0	2.61	2.28	2.20	2.22	3.70	19.6	21.7	12.5	15.4	22.3	11.2	11.8
1978	2.70	2.23	2.17	3.48	8.78	12.3	19.0	46.8	32.7	18.6	19.0	23.5	16.0
1979	18.6	2.04	2.22	2.14	12.6	15.5	19.1	17.6	15.9	16.3	14.9	26.6	13.6
1980	26.3	2.57	2.56	2.50	2.53	4.00	18.2	19.7	14.6	8.95	9.25	21.4	11.1
1981	19.5	2.26	2.37	2.40	2.40	5.28	9.52	12.8	9.92	12.3	24.3	17.0	10.1
1982	6.40	2.03	2.20	2.33	2.72	4.72	44.1	45.4	47.2	81.1	72.7	58.0	30.9
1983	2.03	.13	.89	1.53	5.18	10.3	19.5	32.3	6.57	4.97	4.31	4.05	7.67
1984	(1)	(1)	(1)	(1)	(1)	2.11	5.63	15.7	20.5	15.8	14.2	12.0	(2)
1985	(1)	(1)	(1)	(1)	(1)	22.9	15.6	12.0	12.1	13.6	25.1	16.7	(2)
1986	(1)	(1)	(1)	(1)	(1)	10.4	22.7	20.3	14.3	9.79	11.0	22.5	(2)
1987	(1)	(1)	(1)	(1)	(1)	7.98	21.6	17.6	10.7	8.85	19.7	15.8	(2)
1988	(1)	(1)	(1)	(1)	(1)	3.47	19.8	19.5	10.9	16.7	16.3	13.7	(2)
1989	(1)	(1)	(1)	(1)	(1)	5.11	17.2	14.0	10.1	13.7	15.4	11.9	(2)
1990	(1)	(1)	(1)	(1)	(1)	4.98	22.0	22.8	15.7	13.0	13.0	11.4	(2)
1991	(1)	(1)	(1)	(1)	(1)	(1)	17.5	19.5	44.0	15.5	17.9	15.7	(2)
1992	(1)	(1)	(1)	(1)	(1)	(1)	15.9	16.0	15.0	14.6	12.3	10.3	(2)
1993	(1)	(1)	(1)	(1)	(1)	6.90	16.7	21.5	38.4	28.5	23.5	26.6	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Deerfield Reservoir effectively filled during water year 1947.

Table E19.2. Statistics on mean flow, in cubic feet per second, for station 06410000, Castle Creek below Deerfield Dam (October 1947 through September 1983)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	36	36	36	36	36	36	36	36	36	36	36	36	36
Maximum	40.0	7.69	2.72	3.48	12.6	15.5	44.1	46.8	50.0	81.1	72.7	64.2	30.9
Percentile													
75th	18.0	2.58	2.38	2.39	2.57	7.79	19.6	24.5	18.0	19.3	22.8	28.0	13.0
50th	9.80	2.34	2.17	2.20	2.28	3.37	16.1	18.6	14.6	12.5	16.3	18.7	10.6
25th	2.96	2.03	1.98	2.00	2.10	2.17	2.79	12.8	10.0	8.45	9.42	10.1	8.42
Minimum	1.85	0.017	0.89	1.53	1.26	1.56	1.59	1.59	2.39	2.13	3.78	4.05	2.62
Mean	11.47	2.50	2.13	2.24	2.86	5.31	14.43	19.25	16.30	16.54	18.96	21.35	11.15
Standard deviation	9.73	1.22	0.36	0.38	2.10	4.28	9.85	11.49	10.53	14.12	13.79	14.51	5.26
Skewness	1.15	2.16	-1.53	1.06	3.71	1.24	0.61	0.68	1.65	2.99	2.42	1.23	1.44
Coefficient of variation	0.85	0.49	0.17	0.17	0.74	0.81	0.68	0.60	0.65	0.85	0.73	0.68	0.47
Percent of annual flow	8.60	1.87	1.60	1.68	2.14	3.98	10.82	14.44	12.23	12.40	14.22	16.02	[1]0.085

[1]Serial correlation for annual mean flows.

Table E19.3. Serial correlation for 1-year lag for monthly mean flow for station 06410000, Castle Creek below Deerfield Dam (October 1947 through September 1983)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.055	0.214	0.222	0.134	0.402	0.317	0.423	0.246	-0.057	-0.129	-0.048	0.165

Table E19.4. Correlation matrix for monthly mean flow for station 06410000, Castle Creek below Deerfield Dam (October 1947 through September 1983)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.168	0.204	0.163	0.093	0.307	0.123	-0.088	-0.099	-0.142	-0.046	0.243
Nov.	*	1.000	0.272	0.059	-0.152	-0.190	0.081	-0.103	0.050	0.091	0.135	0.088
Dec.	*	*	1.000	0.664	-0.009	0.100	0.208	0.141	0.212	0.124	0.106	0.190
Jan.	*	*	*	1.000	0.319	0.347	0.322	0.423	0.337	0.151	0.123	0.202
Feb.	*	*	*	*	1.000	0.615	0.181	0.276	0.127	0.020	-0.054	0.067
Mar.	*	*	*	*	*	1.000	0.433	0.231	0.073	-0.069	-0.122	0.280
Apr.	*	*	*	*	*	*	1.000	0.703	0.520	0.446	0.330	0.533
May	*	*	*	*	*	*	*	1.000	0.693	0.490	0.417	0.495
June	*	*	*	*	*	*	*	*	1.000	0.717	0.632	0.623
July	*	*	*	*	*	*	*	*	*	1.000	0.841	0.569
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.742
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E19.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06410000, Castle Creek below Deerfield Dam

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1948	.0000	1	1.90	16	1.90	16	1.90	14	1.90	12	1.90	8	1.93	7	1.95	6	5.02	25
1949	1.90	17	1.90	17	1.90	17	1.90	15	1.90	13	1.90	9	1.91	6	1.95	7	3.87	16
1950	1.90	18	1.90	18	1.90	18	1.90	16	1.93	14	1.96	11	1.97	10	1.98	8	2.58	8
1951	1.90	19	1.90	19	1.90	19	1.90	17	1.93	15	2.45	32	2.47	32	2.47	31	2.92	11
1952	1.90	20	1.90	20	1.91	24	1.96	23	1.98	20	1.99	13	2.01	11	2.04	12	4.20	18
1953	2.00	25	2.00	25	2.00	25	2.00	24	2.06	24	2.17	24	2.16	20	2.20	17	3.77	15
1954	2.30	34	2.30	33	2.30	33	2.30	33	2.30	31	2.31	29	2.34	28	2.36	28	2.81	10
1955	1.80	14	1.80	13	1.86	14	1.91	20	1.97	18	2.12	22	2.24	24	2.33	25	2.72	9
1956	2.10	27	2.10	27	2.11	27	2.16	27	2.21	28	2.29	27	2.32	27	2.31	23	4.76	23
1957	1.80	15	1.80	14	1.80	13	1.81	10	1.83	8	1.92	10	1.96	9	1.98	9	2.05	3
1958	1.70	8	1.70	7	1.76	10	1.78	9	1.86	10	1.97	12	2.01	12	2.03	11	4.24	19
1959	.0000	2	.0000	1	.0000	1	.0000	1	.0000	1	.13	1	.61	2	.88	1	1.51	1
1960	1.40	5	1.40	4	1.40	4	1.44	4	1.52	4	1.59	3	1.64	3	1.75	3	3.73	14
1961	1.60	6	1.60	5	1.66	5	1.67	5	1.68	5	1.71	5	1.83	5	1.90	5	2.02	2
1962	1.70	9	1.70	8	1.70	7	1.75	7	1.79	7	2.06	18	2.11	17	2.12	14	2.19	4
1963	1.90	21	1.90	21	1.90	20	1.90	18	1.95	16	2.08	19	2.17	21	2.21	18	2.29	6
1964	1.90	22	1.90	22	1.90	21	1.94	22	1.99	22	2.05	17	2.15	19	2.23	19	4.13	17
1965	2.10	28	2.30	34	2.30	34	2.36	34	2.43	34	2.51	35	2.59	35	2.74	34	11.6	35
1966	1.70	10	1.70	9	1.73	9	1.76	8	1.84	9	2.02	15	2.08	14	2.13	15	5.12	27
1967	1.70	11	1.70	10	1.70	8	1.70	6	1.72	6	1.84	6	2.08	15	2.24	20	4.35	21
1968	1.90	23	1.90	23	1.90	22	1.90	19	1.97	19	2.02	16	2.05	13	2.07	13	5.55	28
1969	1.70	12	1.77	12	1.79	11	1.81	11	1.87	11	1.89	7	1.95	8	1.99	10	2.23	5
1970	.67	4	.67	3	.67	3	.75	3	1.29	3	1.59	4	1.77	4	1.84	4	2.56	7
1971	1.80	16	1.83	15	1.86	15	1.89	13	1.98	21	2.01	14	2.08	16	2.16	16	9.51	34
1972	2.20	30	2.20	29	2.20	29	2.20	29	2.27	30	2.34	30	2.37	30	2.36	29	6.44	30
1973	2.00	26	2.00	26	2.03	26	2.04	25	2.15	26	2.24	26	2.29	26	2.32	24	4.90	24
1974	2.20	31	2.20	30	2.20	30	2.24	30	2.36	33	2.48	33	2.54	34	2.56	33	4.40	22
1975	2.20	32	2.23	32	2.27	32	2.28	32	2.30	32	2.36	31	2.40	31	2.44	30	5.06	26
1976	2.10	29	2.10	28	2.14	28	2.17	28	2.19	27	2.21	25	2.23	23	2.25	21	6.48	31
1977	1.60	7	1.63	6	1.69	6	2.04	26	2.11	25	2.15	23	2.26	25	2.33	26	4.25	20
1978	1.70	13	1.73	11	1.79	12	1.83	12	1.95	17	2.08	20	2.11	18	3.76	35	8.93	33
1979	2.40	35	2.47	35	2.49	35	2.49	35	2.50	35	2.50	34	2.53	33	2.54	32	6.81	32
1980	2.20	33	2.20	31	2.20	31	2.24	31	2.26	29	2.30	28	2.34	29	2.35	27	5.87	29
1981	1.90	24	1.90	24	1.90	23	1.93	21	2.01	23	2.10	21	2.18	22	2.30	22	3.36	13
1982	.060	3	.10	2	.11	2	.12	2	.13	2	.43	2	.53	1	1.05	2	3.00	12

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E19.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06410000, Castle Creek below Deerfield Dam

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1948	26.0	30	26.0	28	25.3	28	24.6	28	23.9	26	21.4	23	16.7	25	15.6	25	13.4	26
1949	41.0	18	41.0	18	41.0	15	31.7	23	20.0	28	14.9	29	14.2	30	13.5	29	13.4	27
1950	47.0	15	47.0	14	38.0	21	37.3	17	29.3	17	22.9	19	21.6	16	21.5	14	17.1	17
1951	22.0	33	22.0	33	21.4	33	17.1	33	17.0	32	14.3	31	11.1	31	11.1	31	8.92	31
1952	200	1	123	2	78.3	3	52.3	6	35.3	11	26.1	15	24.3	13	23.3	7	21.3	10
1953	30.0	27	25.0	30	22.1	31	19.9	31	17.3	31	14.9	30	14.8	28	14.6	28	11.7	30
1954	65.0	7	64.3	6	59.7	6	53.8	5	52.1	4	35.6	5	30.9	5	26.9	5	22.2	8
1955	57.0	12	50.7	12	44.4	12	36.3	18	32.4	16	27.0	12	25.0	10	21.4	15	17.6	15
1956	52.0	14	51.3	11	44.6	11	35.9	19	33.2	15	32.6	6	27.6	6	23.1	9	16.7	19
1957	24.0	32	24.0	32	24.0	29	23.4	29	18.1	29	12.4	32	9.11	32	7.43	33	5.78	33
1958	34.0	25	34.0	24	34.0	24	32.6	22	26.3	23	24.2	17	20.9	18	21.1	16	16.6	20
1959	125	2	124	1	120	1	98.3	1	64.2	2	62.4	2	53.6	2	46.7	2	35.8	2
1960	13.0	35	9.93	36	7.13	36	6.52	36	6.39	36	5.87	35	5.48	35	4.85	35	3.73	35
1961	60.0	10	59.3	8	58.9	7	37.5	16	21.2	27	11.5	33	8.15	34	6.54	34	5.02	34
1962	10.0	36	10.0	35	9.91	35	9.60	35	7.69	35	5.04	36	4.07	36	3.98	36	3.67	36
1963	14.0	34	14.0	34	14.0	34	13.5	34	11.6	34	9.77	34	9.04	33	8.29	32	6.16	32
1964	64.0	8	45.7	15	34.6	23	31.6	24	28.7	18	23.9	18	23.1	14	22.9	10	20.9	11
1965	90.0	3	72.7	5	66.1	4	59.4	3	53.1	3	48.4	3	40.1	3	35.8	3	32.3	3
1966	55.0	13	55.0	9	54.0	9	52.3	7	47.8	6	31.5	7	25.3	9	22.7	11	23.1	6
1967	59.0	11	47.7	13	37.6	22	34.9	21	34.4	13	30.4	9	26.6	7	26.6	6	25.2	5
1968	39.0	23	39.0	23	38.9	20	38.4	13	26.6	21	18.5	26	15.9	26	15.7	24	15.5	22
1969	40.0	20	40.0	20	40.0	17	39.9	10	37.9	8	30.0	11	25.0	11	21.8	13	20.8	12
1970	74.0	6	63.0	7	57.6	8	50.2	8	42.6	7	30.3	10	25.0	12	23.3	8	22.9	7
1971	61.0	9	54.0	10	49.4	10	43.9	9	37.4	9	30.5	8	26.1	8	22.0	12	22.2	9
1972	40.0	21	40.0	21	39.6	18	39.1	12	34.6	12	25.0	16	19.0	21	17.6	21	16.5	21
1973	40.0	22	40.0	22	39.6	19	39.2	11	27.5	19	22.9	20	20.2	19	19.1	18	18.8	13
1974	26.0	31	25.7	29	23.9	30	22.1	30	17.6	30	16.1	27	14.7	29	13.1	30	12.4	29
1975	46.0	16	44.3	16	42.7	13	38.3	14	34.0	14	26.6	14	22.9	15	19.9	17	17.0	18
1976	28.0	29	25.0	31	22.0	32	18.9	32	17.0	33	15.8	28	15.7	27	14.9	27	13.9	25
1977	42.0	17	42.0	17	42.0	14	35.1	20	25.6	24	21.9	22	18.3	22	18.5	19	17.4	16
1978	83.0	5	75.0	4	65.1	5	56.2	4	49.2	5	40.6	4	34.3	4	30.0	4	26.6	4
1979	37.0	24	31.0	25	29.0	25	28.5	25	26.6	22	20.7	24	19.3	20	18.4	20	18.4	14
1980	30.0	28	29.0	27	28.4	27	27.9	26	27.1	20	19.3	25	17.6	24	15.5	26	15.3	23
1981	33.0	26	29.7	26	28.6	26	27.3	27	25.5	25	22.9	21	18.2	23	16.3	23	14.4	24
1982	86.0	4	85.0	3	84.4	2	83.3	2	81.7	1	77.2	1	74.9	1	67.8	1	58.4	1
1983	41.0	19	40.7	19	40.3	16	37.6	15	35.6	10	26.7	13	21.6	17	17.6	22	13.2	28

Table E20.1. Mean flow, in cubic feet per second, for station 06410500, Rapid Creek above Pactola Reservoir, at Silver City

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1954	22.4	17.7	16.5	17.2	18.9	24.4	37.1	40.2	33.6	44.8	40.1	24.6	28.2
1955	15.2	13.7	13.3	12.2	12.8	18.1	60.4	57.6	50.6	55.5	43.8	33.7	32.3
1956	17.9	14.1	12.6	14.3	13.3	36.2	30.0	42.1	48.1	41.4	37.1	17.7	27.1
1957	26.3	19.0	14.3	11.4	13.6	19.2	31.4	62.1	73.1	34.5	38.7	22.3	30.6
1958	17.2	16.0	14.7	12.3	15.7	20.4	29.1	37.8	51.1	40.6	34.7	33.4	26.9
1959	24.9	17.8	13.2	13.4	16.6	23.0	45.7	47.4	45.0	50.5	63.7	68.6	35.9
1960	17.7	12.1	12.5	10.2	10.4	26.4	28.6	25.3	27.6	18.0	14.2	12.5	18.0
1961	30.5	12.4	12.5	11.2	13.5	17.3	16.5	14.5	14.7	15.2	11.5	10.5	15.1
1962	10.2	10.3	7.77	8.61	13.2	12.1	19.2	67.4	174	63.4	39.7	23.0	37.4
1963	20.4	15.7	13.5	9.94	11.2	29.3	67.6	105	266	82.5	39.1	35.3	58.0
1964	22.6	21.8	17.7	20.0	21.1	22.3	64.9	95.3	171	93.1	62.5	54.0	55.5
1965	39.6	25.0	24.3	25.0	26.1	22.6	61.6	274	291	156	80.1	71.4	91.7
1966	73.5	29.9	23.2	20.5	26.1	57.3	69.4	58.0	38.6	31.3	32.0	57.4	43.2
1967	29.6	21.0	17.2	19.5	18.8	42.1	53.8	70.8	188	111	59.9	61.9	57.8
1968	30.0	23.5	19.8	21.8	22.6	31.8	41.4	40.1	49.1	38.0	29.3	40.4	32.3
1969	33.2	16.3	16.2	18.5	18.3	25.7	59.9	67.1	40.7	47.5	39.4	54.4	36.5
1970	20.0	17.9	15.2	17.3	19.7	21.7	116	169	103	47.1	47.5	45.5	53.4
1971	19.1	16.6	14.1	16.2	22.3	30.4	172	151	119	44.5	33.8	53.5	57.7
1972	55.2	27.2	18.1	16.1	20.0	50.7	48.4	58.7	89.3	60.3	51.6	52.0	45.7
1973	45.5	20.8	18.2	18.9	18.3	24.5	75.8	110	67.0	41.7	42.0	43.5	44.0
1974	33.8	22.3	20.5	13.2	12.4	15.0	39.6	37.9	25.7	21.6	23.3	20.6	23.9
1975	21.2	15.9	13.6	9.81	8.91	14.5	89.4	119	76.6	44.1	24.5	25.6	38.7
1976	24.7	18.0	19.2	15.0	16.5	28.6	48.9	48.8	137	60.8	33.5	32.6	40.2
1977	39.1	18.7	15.8	14.3	23.0	28.1	113	96.0	41.1	32.4	40.0	26.2	40.7
1978	23.4	18.0	21.7	18.3	19.5	37.0	56.0	258	100	57.6	48.1	41.8	58.7
1979	38.5	22.7	19.9	15.0	34.4	44.8	53.2	46.1	47.1	53.4	46.8	46.9	39.1
1980	40.6	22.6	10.7	13.6	15.8	21.9	56.6	55.5	39.3	21.1	19.6	30.3	28.9
1981	34.3	13.5	12.3	10.3	9.61	13.6	21.9	41.4	24.5	28.1	38.8	30.9	23.4
1982	20.2	11.0	9.82	9.11	10.4	14.5	54.6	103	103	111	101	73.7	52.1
1983	35.9	34.2	20.3	21.5	25.9	38.8	84.5	162	87.5	42.7	36.2	25.0	51.3
1984	25.1	21.9	12.6	21.1	22.5	28.4	55.4	140	122	65.2	53.9	33.6	50.1
1985	34.2	23.7	18.8	18.7	20.7	35.5	51.4	33.2	25.5	22.9	33.7	27.4	28.8
1986	24.9	16.9	14.9	10.3	14.9	41.0	61.0	78.2	54.7	35.7	27.4	45.0	35.5
1987	57.4	36.6	20.7	18.6	22.4	46.3	73.1	62.7	35.3	22.8	31.0	23.7	37.6
1988	31.9	21.2	9.74	8.65	14.2	21.5	46.3	52.4	27.1	28.6	26.9	20.7	25.8
1989	18.5	17.4	10.2	9.58	8.77	21.7	35.0	38.6	24.9	23.5	23.1	21.6	21.1
1990	19.3	12.3	12.0	9.52	9.51	23.6	57.6	67.3	40.4	24.2	22.5	20.1	26.6
1991	16.5	12.7	9.38	13.6	12.1	17.0	42.5	98.4	200	53.4	38.6	31.9	45.5
1992	17.5	19.4	16.3	13.5	14.9	32.8	38.2	36.5	35.5	41.4	32.7	26.6	27.1
1993	18.1	14.0	11.1	10.5	8.34	20.7	55.9	151	223	102	60.7	51.8	60.8

Table E20.2. Statistics on mean flow, in cubic feet per second, for station 06410500, Rapid Creek above Pactola Reservoir, at Silver City (October 1953 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	40	40	40	40	40	40	40	40	40	40	40	40	40
Maximum	73.5	36.6	24.3	25.0	34.4	57.3	172	274	291	156	101	73.7	91.7
Percentile													
75th	34.3	22.2	18.6	18.6	21.0	34.8	64.1	104	115	59.6	47.3	50.6	51.0
50th	24.9	18.0	14.8	13.9	16.1	24.5	54.2	62.4	50.8	43.4	38.6	33.0	37.5
25th	19.1	14.5	12.5	10.3	12.5	20.5	38.5	41.6	36.3	29.3	29.7	23.9	27.4
Minimum	10.2	10.3	7.77	8.61	8.34	12.1	16.5	14.5	14.7	15.2	11.5	10.5	15.1
Mean	28.65	19.04	15.36	14.72	16.93	27.52	56.57	82.98	85.27	50.23	40.07	36.79	39.58
Standard deviation	12.87	5.88	4.08	4.38	5.86	10.78	28.80	58.09	70.27	29.70	17.22	16.34	15.05
Skewness	1.53	1.09	0.28	0.39	0.67	0.90	1.95	1.76	1.45	1.69	1.38	0.62	1.05
Coefficient of variation	0.45	0.31	0.27	0.30	0.35	0.39	0.51	0.70	0.82	0.59	0.43	0.44	0.38
Percent of annual flow	6.04	4.02	3.24	3.10	3.57	5.80	11.93	17.50	17.98	10.59	8.45	7.76	[1]0.344

[1]Serial correlation for annual mean flows.

Table E20.3. Serial correlation for 1-year lag for monthly mean flow for station 06410500, Rapid Creek above Pactola Reservoir, at Silver City (October 1953 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.247	0.205	0.298	0.476	0.391	0.246	0.275	0.067	0.177	0.110	0.056	0.316

Table E20.4. Correlation matrix for monthly mean flow for station 06410500, Rapid Creek above Pactola Reservoir, at Silver City (October 1953 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.761	0.605	0.476	0.552	0.609	0.134	-0.037	-0.218	-0.140	-0.041	0.201
Nov.	*	1.000	0.711	0.673	0.686	0.651	0.228	0.126	-0.084	-0.047	-0.008	0.122
Dec.	*	*	1.000	0.763	0.709	0.599	0.204	0.277	0.018	0.135	0.097	0.283
Jan.	*	*	*	1.000	0.782	0.487	0.291	0.408	0.190	0.283	0.270	0.391
Feb.	*	*	*	*	1.000	0.624	0.370	0.260	0.026	0.135	0.198	0.350
Mar.	*	*	*	*	*	1.000	0.195	-0.001	-0.099	-0.054	-0.042	0.210
Apr.	*	*	*	*	*	*	1.000	0.498	0.164	0.085	0.103	0.313
May	*	*	*	*	*	*	*	1.000	0.613	0.579	0.483	0.426
June	*	*	*	*	*	*	*	*	1.000	0.837	0.541	0.445
July	*	*	*	*	*	*	*	*	*	1.000	0.843	0.701
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.786
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E20.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06410500, Rapid Creek above Pactola Reservoir, at Silver City

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1954	9.00	23	9.33	21	11.0	23	11.6	23	11.9	18	12.4	17	12.6	15	13.0	13	14.2	9
1955	6.00	6	7.00	8	10.0	18	10.6	18	11.7	17	12.8	19	13.3	19	13.0	14	15.7	12
1956	10.0	25	10.0	24	10.3	22	10.7	20	11.3	16	12.5	18	13.0	17	14.1	16	17.0	15
1957	8.00	19	8.00	15	8.29	12	8.79	13	9.03	10	11.8	14	12.9	16	13.9	15	16.0	14
1958	10.0	26	10.0	25	10.0	19	10.6	19	12.7	21	12.8	20	13.5	20	14.6	18	18.2	17
1959	7.00	11	7.00	9	7.57	9	8.50	8	10.1	14	10.2	9	10.5	8	11.2	7	15.0	10
1960	6.00	7	7.33	12	8.14	11	9.07	15	10.9	15	11.6	13	11.8	13	12.3	12	15.3	11
1961	4.00	2	4.67	3	5.43	2	6.57	2	7.67	1	8.12	1	8.79	1	9.12	1	9.66	1
1962	7.00	12	8.33	17	8.71	16	9.36	16	9.83	12	10.4	10	10.6	9	11.6	10	14.0	8
1963	12.0	35	13.0	35	13.7	32	14.8	32	17.4	32	18.7	33	19.5	34	19.9	31	20.9	25
1964	10.0	27	12.0	30	15.6	39	17.4	38	21.4	39	23.1	39	24.2	39	24.2	37	27.3	34
1965	10.0	28	12.3	32	14.3	35	15.8	35	18.9	37	20.9	38	22.7	38	24.6	38	39.0	39
1966	10.0	29	12.0	31	12.4	28	13.4	27	15.8	30	18.0	30	18.2	29	18.9	27	24.5	31
1967	10.0	30	12.7	33	14.3	36	14.5	30	16.2	31	19.0	36	20.8	36	21.8	35	24.9	33
1968	11.0	33	11.7	29	13.3	30	14.4	28	15.6	28	16.1	26	16.7	26	17.1	24	21.6	28
1969	8.00	20	10.3	27	11.4	26	12.7	26	14.1	25	15.4	25	16.3	25	17.3	25	18.8	20
1970	7.00	13	8.67	19	11.3	24	11.8	24	12.9	22	13.4	21	14.9	22	15.9	22	18.9	21
1971	10.0	31	10.0	26	12.3	27	14.4	29	15.6	29	16.3	27	17.9	27	20.2	33	31.2	37
1972	10.0	32	13.7	38	14.6	37	15.4	34	17.4	33	18.3	32	18.3	30	19.0	28	24.7	32
1973	7.00	14	7.67	13	9.29	17	9.93	17	12.1	19	12.3	16	12.5	14	15.1	20	19.7	23
1974	6.00	8	6.33	6	7.14	7	7.86	6	8.18	4	9.07	3	9.29	2	11.2	8	13.8	7
1975	8.00	21	8.67	20	10.0	20	11.5	22	13.4	24	15.0	24	15.6	23	16.8	23	19.5	22
1976	9.00	24	9.33	22	10.1	21	11.1	21	14.1	26	14.6	23	15.9	24	17.6	26	23.1	29
1977	13.0	39	14.0	39	15.1	38	16.6	37	18.0	36	18.8	34	19.3	33	19.3	29	20.5	24
1978	12.0	36	13.0	36	14.0	33	14.5	31	15.0	27	17.0	29	18.7	31	21.6	34	28.7	35
1979	7.00	15	7.73	14	8.29	13	8.90	14	9.92	13	12.0	15	13.1	18	14.8	19	20.9	26
1980	7.00	16	7.27	11	7.80	10	8.67	10	9.64	11	9.89	8	10.7	10	10.9	5	15.8	13
1981	7.50	17	8.17	16	8.43	14	8.68	11	8.88	7	9.21	5	9.59	5	10.0	2	12.6	2
1982	8.00	22	9.93	23	13.1	29	17.7	39	19.3	38	20.4	37	22.4	37	24.6	39	28.8	36
1983	5.00	4	5.47	4	6.17	4	8.61	9	12.3	20	16.3	28	18.0	28	19.3	30	21.1	27
1984	12.0	37	12.7	34	13.3	31	14.8	33	17.4	34	18.0	31	19.1	32	20.1	32	24.2	30
1985	2.50	1	2.83	1	3.64	1	5.89	1	8.20	5	11.2	12	11.3	11	14.2	17	18.2	18
1986	12.0	38	13.0	37	14.1	34	16.4	36	17.9	35	18.9	35	20.2	35	23.6	36	33.3	38
1987	6.00	9	6.67	7	7.00	6	7.86	7	8.00	2	8.52	2	9.56	4	11.3	9	17.6	16
1988	4.00	3	4.33	2	6.00	3	7.81	5	8.73	6	9.09	4	9.43	3	10.9	6	13.7	6
1989	6.50	10	7.00	10	7.30	8	7.63	4	8.92	8	9.37	7	10.2	7	10.8	4	13.6	4
1990	7.80	18	8.47	18	8.67	15	8.76	12	8.98	9	10.7	11	11.5	12	11.9	11	13.6	5
1991	11.0	34	11.0	28	11.3	25	12.1	25	12.9	23	13.5	22	14.7	21	15.7	21	18.5	19
1992	5.00	5	5.50	5	6.43	5	7.21	3	8.13	3	9.31	6	9.98	6	10.5	3	13.0	3

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E20.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06410500, Rapid Creek above Pactola Reservoir, at Silver City

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1954	88.0	27	79.3	31	71.6	29	62.9	30	61.6	27	45.3	34	44.5	30	41.3	32	37.5	31
1955	228	13	139	20	102	21	74.2	25	68.9	25	61.8	26	57.3	24	56.9	21	50.3	21
1956	120	23	117	22	97.1	23	68.0	27	58.4	29	49.9	29	45.5	29	44.1	28	39.8	27
1957	159	20	142	19	130	18	107	19	89.8	19	69.1	21	58.4	23	52.4	25	43.8	26
1958	88.0	28	81.3	29	71.4	30	62.5	31	55.5	31	48.1	31	43.9	31	41.8	31	37.8	30
1959	142	21	136	21	130	19	103	20	68.6	26	66.2	23	60.7	22	57.2	20	53.5	19
1960	100	26	81.0	30	64.1	33	47.1	37	38.2	39	31.9	39	30.8	39	28.6	39	23.4	39
1961	70.0	34	69.3	32	68.6	31	48.1	36	31.5	40	21.9	40	18.7	40	16.8	40	16.5	40
1962	370	10	340	10	304	8	229	9	181	10	133	11	107	13	87.7	13	64.4	13
1963	683	3	607	2	487	2	363	2	269	2	188	3	157	3	132	3	101	3
1964	485	5	395	7	305	7	232	8	188	9	140	9	123	8	107	9	90.0	8
1965	1,330	1	810	1	536	1	439	1	347	1	307	1	247	1	203	1	156	1
1966	110	25	94.0	25	83.1	25	81.6	23	74.9	22	69.3	20	63.3	20	56.7	22	48.9	24
1967	559	4	462	3	373	3	288	5	208	7	150	8	125	7	108	8	91.1	7
1968	81.0	32	69.0	33	59.1	36	52.7	34	49.2	34	45.5	33	43.6	32	42.7	30	39.7	28
1969	130	22	109	23	94.1	24	82.8	22	71.2	23	64.1	24	56.2	26	54.1	24	51.5	20
1970	777	2	456	4	260	11	224	10	196	8	157	6	132	6	110	6	88.0	9
1971	286	11	271	11	264	10	244	7	211	6	175	5	149	4	124	4	95.8	4
1972	183	16	151	18	117	20	112	18	97.4	18	79.2	18	70.4	18	65.5	18	60.2	17
1973	160	19	157	17	152	17	138	17	128	16	103	16	86.2	15	74.6	15	63.4	14
1974	51.0	40	48.3	39	45.7	39	44.1	38	42.7	36	39.2	35	35.2	36	31.7	37	28.5	37
1975	180	17	174	15	164	16	149	15	139	15	108	14	97.4	14	83.2	14	63.1	15
1976	483	6	399	6	295	9	207	11	141	14	101	17	82.4	17	74.1	16	60.3	16
1977	179	18	171	16	166	15	158	14	142	13	106	15	84.4	16	71.2	17	59.2	18
1978	396	8	380	9	326	6	321	3	263	3	185	4	144	5	120	5	94.9	5
1979	88.0	29	82.7	28	76.0	28	64.5	28	56.2	30	51.2	28	49.6	28	50.1	26	49.1	23
1980	70.0	35	69.0	34	66.0	32	63.9	29	61.3	28	57.3	27	50.8	27	43.9	29	37.0	32
1981	78.0	33	68.7	35	58.9	37	50.7	35	44.6	35	39.1	36	33.0	38	34.1	36	31.0	36
1982	255	12	226	12	185	14	148	16	124	17	117	13	114	10	109	7	91.4	6
1983	222	14	216	13	207	12	189	12	169	11	136	10	113	11	96.0	12	75.4	12
1984	194	15	190	14	188	13	166	13	144	12	132	12	111	12	98.7	11	78.4	10
1985	66.0	37	64.0	37	60.1	35	58.3	33	55.5	32	46.4	32	41.2	34	36.9	35	34.5	35
1986	115	24	107	24	99.6	22	90.2	21	85.9	20	73.1	19	65.3	19	59.5	19	50.3	22
1987	88.0	30	85.0	26	82.1	26	81.1	24	75.9	21	68.6	22	62.8	21	55.0	23	45.3	25
1988	68.0	36	65.7	36	63.0	34	60.9	32	53.3	33	49.7	30	43.3	33	39.4	33	34.7	34
1989	53.0	38	51.0	38	47.1	38	43.6	39	41.1	38	37.0	38	33.6	37	31.2	38	28.3	38
1990	88.0	31	83.0	27	76.4	27	74.2	26	70.7	24	63.2	25	56.3	25	48.4	27	39.6	29
1991	390	9	381	8	350	5	284	6	222	5	153	7	119	9	101	10	77.2	11
1992	52.0	39	47.3	40	43.7	40	42.1	40	41.6	37	38.9	37	37.9	35	38.2	34	36.3	33
1993	434	7	414	5	353	4	289	4	224	4	193	2	160	2	136	2	107	2

Table 21.1. Mean flow, in cubic feet per second, for station 06411500, Rapid Creek below Pactola Dam

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1929	(1)	(1)	(1)	(1)	(1)	(1)	(1)	282	407	160	88.8	77.8	(2)
1930	67.9	57.6	60.0	60.0	55.0	62.4	134	106	71.6	46.8	46.9	41.0	67.5
1931	59.1	38.1	(1)	(1)	(1)	53.5	63.0	53.5	30.5	24.1	23.8	22.5	(2)
1932	28.9	29.4	(1)	(1)	(1)	32.3	72.3	97.9	86.8	(1)	(1)	(1)	(2)
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	33.6	35.9	(2)
1947	41.4	30.6	21.5	19.8	22.6	30.6	76.1	82.8	225	150	59.5	36.6	66.5
1948	31.6	27.8	26.4	20.7	22.1	33.5	64.3	46.9	58.1	68.9	48.6	31.8	40.1
1949	35.4	29.7	18.5	19.4	20.6	34.0	84.9	66.6	106	44.9	34.9	29.2	43.7
1950	32.9	25.0	16.4	17.4	17.2	22.7	92.6	109	53.0	54.6	32.1	32.0	42.2
1951	25.5	17.2	16.9	13.3	14.8	18.3	28.1	43.3	56.7	35.5	39.4	33.8	28.6
1952	21.8	15.8	14.4	13.8	15.6	22.1	71.7	298	112	57.6	45.5	36.0	60.6
1953	30.6	18.2	15.8	21.3	23.6	30.8	38.6	82.0	74.7	41.2	37.3	26.2	36.8
1954	22.5	17.9	17.6	19.2	20.7	26.8	38.4	42.5	33.6	43.0	41.9	24.8	29.2
1955	15.3	15.5	12.8	12.1	13.4	17.4	59.7	58.8	50.4	53.5	43.5	29.6	31.9
1956	17.8	14.4	12.8	13.6	12.5	35.1	31.8	45.3	50.3	43.1	31.4	16.4	27.1
1957	22.4	11.6	11.0	11.0	10.9	7.13	7.83	24.4	6.10	10.1	31.6	29.7	15.4
1958	10.8	6.53	7.90	7.39	7.43	7.71	8.33	29.2	34.9	32.4	31.6	33.0	18.2
1959	25.1	15.5	7.94	8.58	8.82	8.48	26.1	48.9	41.9	52.7	65.1	33.2	28.7
1960	12.2	6.90	7.16	7.16	7.31	7.71	21.8	47.8	36.4	68.2	57.2	40.8	26.8
1961	25.5	17.9	9.10	8.58	9.36	9.42	27.6	43.3	83.3	71.7	36.3	29.7	31.1
1962	12.3	9.80	7.48	8.00	7.07	7.74	13.8	29.4	4.87	5.15	31.2	18.0	13.0
[3]1963	4.40	6.90	6.69	6.21	6.65	6.45	6.50	17.7	23.5	102	46.9	33.9	22.5
1964	23.2	15.6	15.6	16.3	15.0	18.7	64.9	101	191	119	72.4	39.9	57.8
1965	40.0	23.0	20.7	22.6	18.8	25.6	66.5	238	415	168	90.8	66.1	99.8
1966	78.5	36.8	27.4	23.5	25.3	62.5	68.0	74.8	57.8	53.7	29.5	27.0	47.2
1967	27.1	18.7	16.7	16.0	15.5	33.1	48.5	83.2	212	149	72.7	65.3	63.3
1968	32.0	20.2	20.0	20.1	19.5	29.9	26.7	45.1	46.1	53.8	50.3	28.6	32.8
1969	20.0	16.3	15.6	15.4	16.5	17.4	38.7	84.3	64.6	60.3	54.7	55.9	38.4
1970	16.2	17.9	15.5	15.0	15.0	15.1	37.4	150	116	76.8	63.0	61.9	50.2
1971	15.8	14.3	14.0	13.2	13.9	21.8	141	183	142	73.2	73.6	45.6	62.8
1972	15.1	18.1	18.0	18.4	18.8	64.2	39.5	47.3	79.2	127	88.8	58.0	49.5
1973	48.3	24.0	23.3	24.3	21.4	14.3	42.5	126	87.1	90.8	59.3	44.0	50.7
1974	19.9	18.1	15.2	15.5	16.0	15.2	15.4	56.9	49.2	89.8	62.9	33.4	34.2
1975	14.9	11.8	15.4	15.9	15.7	16.0	16.0	36.9	63.2	70.1	56.4	52.2	32.1
1976	15.7	16.0	15.8	15.3	16.5	20.0	20.7	37.3	130	67.6	55.2	45.4	37.9
1977	16.3	16.0	16.0	15.6	15.3	23.1	89.5	112	76.9	79.9	47.7	31.7	45.1
1978	12.7	14.8	14.0	14.8	13.8	14.6	14.8	223	161	62.4	47.5	37.0	52.8
1979	38.3	24.3	23.8	26.4	38.2	38.4	43.5	55.3	67.8	50.4	41.0	39.2	40.5
1980	25.2	28.9	27.1	24.6	18.2	18.6	34.2	68.8	48.6	83.1	66.0	30.1	39.6
1981	13.3	13.3	14.6	14.6	14.3	13.5	18.8	65.5	37.0	75.6	40.7	59.5	31.9
1982	12.9	9.07	12.9	12.6	13.3	12.4	13.0	28.4	26.7	127	107	75.6	37.8
1983	45.8	31.1	28.4	21.5	24.8	44.6	82.5	176	79.8	75.2	46.7	27.6	57.3
1984	14.2	15.0	18.5	21.3	18.0	19.9	54.7	142	114	79.3	84.1	43.5	52.2
1985	20.8	26.0	24.8	24.4	24.3	38.1	48.2	101	62.4	106	50.5	26.4	46.3
1986	14.7	15.4	14.3	14.5	15.0	14.4	20.8	20.3	40.9	37.4	49.9	29.9	24.0
1987	51.5	46.3	24.5	17.2	16.7	32.1	71.5	63.5	47.9	80.7	52.2	32.9	44.9
1988	15.9	13.8	14.0	14.5	14.9	14.5	27.5	60.3	88.6	105	75.3	60.1	42.1
1989	16.5	13.8	14.3	13.8	15.9	14.4	16.3	49.4	85.8	89.4	61.3	21.5	34.5
1990	15.9	14.9	14.5	15.0	15.2	12.3	14.2	43.6	29.0	76.5	45.5	27.7	27.2
1991	11.1	10.0	12.3	10.6	10.9	11.2	11.3	11.1	17.7	43.9	59.1	38.5	20.7
1992	16.4	15.8	16.3	15.5	16.3	17.1	17.0	64.9	36.0	30.5	62.5	35.5	28.7
1993	21.3	15.0	16.7	17.6	16.7	16.0	16.8	17.3	159	117	59.9	64.4	44.9

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Pactola Reservoir filled during water year 1963.

Table E21.2. Statistics on mean flow, in cubic feet per second, for station 06411500, Rapid Creek below Pactola Dam (October 1963 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	30	30	30	30	30	30	30	30	30	30	30	30	30
Maximum	78.5	46.3	28.4	26.4	38.2	64.2	141	238	415	168	107	75.6	99.8
Percentile													
75th	28.3	23.2	21.3	21.3	18.8	30.5	57.2	115	119	105	72.5	58.4	51.1
50th	16.5	16.0	15.9	15.7	16.1	18.0	35.8	65.2	72.3	78.1	59.2	39.5	43.5
25th	15.0	14.7	14.4	14.7	15.0	14.5	16.7	44.7	47.4	61.9	49.3	30.0	33.8
Minimum	11.1	9.07	12.3	10.6	10.9	11.2	11.3	11.1	17.7	30.5	29.5	21.5	20.7
Mean	24.32	19.14	18.01	17.53	17.66	23.63	40.68	85.54	94.41	83.95	60.88	43.48	44.24
Standard deviation	15.26	8.08	4.72	4.16	5.13	13.88	29.45	59.49	78.29	32.08	16.72	14.88	15.18
Skewness	2.03	1.78	1.00	0.71	2.51	1.80	1.59	1.15	2.62	0.77	0.83	0.49	1.62
Coefficient of variation	0.63	0.42	0.26	0.24	0.29	0.59	0.72	0.70	0.83	0.38	0.27	0.34	0.34
Percent of annual flow	4.59	3.62	3.40	3.31	3.34	4.47	7.69	16.16	17.84	15.86	11.50	8.22	[1]0.336

[1]Serial correlation for annual mean flows.

Table E21.3. Serial correlation for 1-year lag for monthly mean flow for station 06411500, Rapid Creek below Pactola Dam (October 1963 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.084	-0.109	-0.029	0.227	-0.067	0.001	0.077	0.149	0.152	-0.093	-0.301	-0.166

Table E21.4. Correlation matrix for monthly mean flow for station 06411500, Rapid Creek below Pactola Dam (October 1963 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.835	0.791	0.640	0.591	0.596	0.380	0.176	0.108	0.007	-0.343	-0.249
Nov.	*	1.000	0.871	0.630	0.525	0.591	0.400	0.169	-0.013	-0.019	-0.347	-0.379
Dec.	*	*	1.000	0.882	0.732	0.633	0.360	0.209	-0.003	0.007	-0.299	-0.370
Jan.	*	*	*	1.000	0.826	0.533	0.244	0.247	0.151	0.106	-0.179	-0.237
Feb.	*	*	*	*	1.000	0.599	0.204	0.072	-0.031	-0.107	-0.347	-0.263
Mar.	*	*	*	*	*	1.000	0.404	0.077	0.030	0.122	-0.140	-0.154
Apr.	*	*	*	*	*	*	1.000	0.568	0.316	0.141	0.034	-0.103
May	*	*	*	*	*	*	*	1.000	0.627	0.229	0.120	0.050
June	*	*	*	*	*	*	*	*	1.000	0.648	0.384	0.405
July	*	*	*	*	*	*	*	*	*	1.000	0.653	0.563
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.610
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E21.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06411500, Rapid Creek below Pactola Dam

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1964	14.0	17	15.0	20	16.7	25	17.6	25	18.5	26	20.2	25	20.6	25	20.7	22	25.3	24
1965	23.0	29	23.0	29	23.0	29	23.0	29	23.5	29	23.6	29	24.8	29	27.4	28	41.4	29
1966	14.0	18	14.0	17	14.0	15	14.0	15	14.7	16	15.2	15	15.8	18	16.3	17	19.3	19
1967	18.0	27	18.0	27	18.3	27	18.6	27	19.1	27	19.6	24	19.8	22	19.8	21	23.7	21
1968	8.40	4	11.8	9	15.0	19	15.0	19	15.1	22	15.5	18	15.6	14	15.9	16	16.9	15
1969	15.0	22	15.0	21	15.0	20	15.0	20	15.0	19	15.0	13	15.0	12	15.1	11	16.0	11
1970	13.0	14	13.0	13	13.0	11	13.0	10	13.0	7	13.5	7	13.7	5	13.8	3	15.3	10
1971	1.40	1	2.00	1	6.69	1	11.1	6	14.6	15	16.3	20	16.9	20	17.3	20	21.9	20
1972	5.00	2	5.20	2	14.0	16	14.0	16	14.0	12	17.7	22	19.9	23	20.8	23	26.2	25
1973	15.0	23	15.0	22	15.0	21	15.0	21	15.0	20	15.3	16	15.6	15	15.4	12	16.8	14
1974	8.80	5	9.10	4	10.2	6	10.6	5	11.4	5	12.9	4	13.8	7	14.3	9	15.1	9
1975	15.0	24	15.0	23	15.0	22	15.0	22	15.3	23	15.5	19	15.6	16	15.6	13	16.6	13
1976	14.0	19	14.0	18	14.4	17	14.7	17	14.9	18	15.4	17	15.6	17	15.7	14	17.2	16
1977	9.40	8	9.60	7	9.66	3	9.88	3	11.2	4	13.3	6	13.6	4	13.8	4	14.1	4
1978	14.0	20	14.0	19	14.6	18	14.8	18	14.8	17	23.4	28	24.6	28	27.7	29	31.1	27
1979	17.0	26	17.3	26	17.7	26	17.7	26	18.0	25	18.3	23	20.4	24	22.1	25	23.8	22
1980	11.0	9	11.0	8	11.6	7	12.6	9	13.1	9	13.2	5	13.7	6	13.9	5	14.0	3
1981	7.80	3	7.93	3	8.06	2	8.21	1	9.07	1	10.2	1	11.1	2	11.5	2	12.4	2
1982	12.0	10	12.0	10	12.0	8	12.2	8	13.0	8	20.8	26	22.4	26	26.0	27	31.8	28
1983	13.0	15	13.7	16	13.9	14	13.9	14	14.2	13	14.6	12	15.4	13	16.7	19	17.2	17
1984	19.0	28	19.0	28	19.0	28	19.0	28	20.6	28	23.3	27	23.8	27	23.9	26	25.1	23
1985	13.0	16	13.0	14	13.3	12	13.6	12	14.2	14	14.3	11	14.4	11	14.5	10	14.7	7
1986	14.0	21	15.0	24	15.0	23	15.3	24	15.7	24	16.7	21	17.7	21	21.4	24	30.2	26
1987	12.0	11	13.0	15	13.4	13	13.6	13	13.7	11	13.8	9	13.9	8	14.1	6	14.6	5
1988	12.0	12	12.0	11	12.3	10	13.0	11	13.5	10	13.9	10	13.9	9	14.2	7	14.8	8
1989	12.0	13	12.0	12	12.0	9	12.0	7	12.3	6	13.7	8	14.1	10	14.2	8	14.6	6
1990	9.00	6	9.30	5	9.67	4	9.84	2	9.99	2	10.3	2	10.9	1	10.9	1	11.1	1
1991	9.00	7	9.40	6	9.87	5	10.4	4	10.9	3	11.2	3	13.3	3	15.7	15	16.2	12
1992	15.0	25	15.0	25	15.0	24	15.0	23	15.0	21	15.1	14	16.0	19	16.4	18	17.5	18

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E21.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06411500, Rapid Creek below Pactola Dam

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1964	252	8	247	8	245	8	242	5	220	5	159	5	139	5	125	5	98.1	4
1965	515	1	513	1	511	1	505	1	421	1	353	1	280	1	231	1	174	1
1966	144	14	140	17	119	18	102	21	80.9	23	78.5	19	73.2	18	67.8	19	57.9	19
1967	406	2	398	2	397	2	385	2	272	3	182	4	150	4	131	3	105	3
1968	77.0	29	70.3	30	66.4	30	65.0	29	61.7	29	54.1	28	51.5	27	49.2	26	42.8	26
1969	142	16	142	14	139	14	108	19	86.2	21	75.1	21	70.5	20	66.0	21	59.8	16
1970	304	5	278	5	258	5	201	9	152	8	137	8	117	7	104	8	84.3	8
1971	338	4	317	4	282	4	262	4	230	4	193	3	157	2	136	2	111	2
1972	177	12	176	12	164	13	157	12	137	11	120	10	101	12	89.1	12	75.3	9
1973	168	13	168	13	167	12	158	11	132	12	109	12	104	11	94.9	10	75.3	10
1974	113	23	113	22	112	22	108	18	94.4	17	81.9	18	68.6	21	65.7	22	51.6	22
1975	85.0	27	85.0	27	84.1	26	77.4	27	72.3	26	67.7	23	65.9	23	63.9	23	49.2	25
1976	234	9	230	9	227	9	215	7	144	10	101	14	85.2	16	76.9	16	59.3	18
1977	188	11	188	11	182	11	139	13	128	14	105	13	97.2	13	91.2	11	73.1	11
1978	386	3	386	3	372	3	365	3	308	2	197	2	152	3	126	4	91.2	5
1979	101	24	99.3	24	97.4	24	86.9	25	75.3	25	63.6	24	58.9	25	55.6	24	49.7	23
1980	118	22	111	23	107	23	96.2	23	93.7	18	77.6	20	73.1	19	68.6	18	55.4	20
1981	142	17	140	16	125	17	113	16	88.6	20	58.9	26	61.6	24	54.4	25	49.7	24
1982	139	18	137	18	136	15	135	14	130	13	118	11	105	10	85.5	14	63.2	15
1983	268	7	268	6	253	6	210	8	189	7	138	7	118	6	105	7	85.2	7
1984	222	10	221	10	219	10	192	10	144	9	129	9	113	9	107	6	86.7	6
1985	144	15	142	15	131	16	130	15	109	15	89.3	16	91.6	14	81.1	15	68.6	14
1986	76.0	30	72.7	29	67.7	29	54.3	30	51.0	30	44.5	30	42.8	30	39.9	30	33.2	29
1987	97.0	25	96.0	25	93.0	25	88.3	24	81.6	22	70.9	22	66.1	22	67.5	20	59.5	17
1988	123	19	122	20	118	19	112	17	109	16	98.9	15	90.7	15	86.3	13	69.6	13
1989	123	20	120	21	114	21	106	20	92.4	19	88.1	17	85.1	17	72.9	17	54.1	21
1990	122	21	122	19	117	20	99.3	22	79.3	24	62.8	25	54.1	26	49.2	27	39.7	28
1991	78.0	28	78.0	28	77.0	28	72.2	28	62.3	28	57.6	27	47.9	28	40.5	29	30.4	30
1992	91.0	26	88.7	26	83.1	27	79.5	26	66.9	27	51.4	29	44.4	29	49.2	28	41.3	27
1993	270	6	254	7	250	7	236	6	202	6	145	6	116	8	101	9	72.4	12

Table E22.1. Mean flow, in cubic feet per second, for station 06412000, Rapid Creek at Big Bend

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1915	(1)	(1)	(1)	(1)	(1)	(1)	94.7	163	221	182	340	183	(2)
1916	95.5	61.1	53.5	(1)	(1)	(1)	94.2	134	(1)	89.4	61.6	47.7	(2)
1917	52.0	51.8	(1)	33.5	27.9	28.5	50.4	152	177	69.4	53.3	40.8	(2)
1932	(1)	(1)	(1)	(1)	(1)	(1)	81.1	98.7	79.9	47.0	49.9	34.2	(2)
1933	38.1	35.2	22.4	(1)	(1)	47.1	128	359	162	70.3	47.7	39.8	(2)
1934	43.5	43.3	39.2	40.0	39.2	41.6	45.8	30.1	29.2	17.1	19.7	20.1	34.0
1935	27.9	25.2	(1)	(1)	(1)	(1)	37.4	49.9	151	61.4	36.0	28.5	(2)
1936	27.7	30.6	26.0	(1)	(1)	29.9	45.3	31.9	21.8	4.12	9.55	8.01	(2)
1937	17.2	21.5	(1)	(1)	(1)	(1)	(1)	25.1	31.5	30.1	10.5	13.1	(2)
1938	13.4	11.9	10.2	13.9	(1)	(1)	37.3	36.9	24.0	15.9	7.65	9.73	(2)
1939	10.7	13.7	9.55	(1)	(1)	(1)	33.9	26.8	16.9	5.02	11.5	7.60	(2)
1940	11.7	11.9	13.2	10.6	14.8	15.1	25.8	19.5	13.0	6.68	6.65	6.35	12.9
1941	9.94	11.1	9.77	8.90	9.61	13.9	48.4	43.9	143	53.0	29.4	18.1	33.2
1942	21.3	20.2	13.3	9.32	11.1	17.3	78.6	229	150	58.3	33.9	25.9	55.9
1943	31.0	27.9	14.1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E22.2. Statistics on mean flow, in cubic feet per second, for station 06412000, Rapid Creek at Big Bend (October 1932 through September 1942)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	10	10	(1)	(1)	(1)	(1)	9	10	10	10	10	10	(1)
Maximum	43.5	43.3	(1)	(1)	(1)	(1)	128	359	162	70.3	47.7	39.8	(1)
Percentile													
75th	30.5	31.7	(1)	(1)	(1)	(1)	63.5	94.7	150	59.1	34.4	26.5	(1)
50th	19.2	20.8	(1)	(1)	(1)	(1)	45.3	34.4	30.3	23.6	15.6	15.6	(1)
25th	11.5	11.9	(1)	(1)	(1)	(1)	35.6	26.4	20.6	6.27	9.07	7.91	(1)
Minimum	9.4	11.1	(1)	(1)	(1)	(1)	25.8	19.5	13.0	4.12	6.65	6.35	(1)
Mean	22.14	22.46	(1)	(1)	(1)	(1)	53.39	85.21	74.24	32.19	21.25	17.72	(1)
Standard deviation	11.86	11.08	(1)	(1)	(1)	(1)	31.63	114.57	66.86	26.02	14.50	10.99	(1)
Skewness	0.74	0.73	(1)	(1)	(1)	(1)	2.00	2.05	0.48	0.32	0.68	0.89	(1)
Coefficient of variation	0.54	0.49	(1)	(1)	(1)	(1)	0.59	1.34	0.90	0.81	0.68	0.62	(1)
Percent of annual flow	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

[1]Statistic not computed.

Table E22.3. Serial correlation for 1-year lag for monthly mean flow for station 06412000, Rapid Creek at Big Bend (October 1932 through September 1942)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.781	0.675	(1)	(1)	(1)	(1)	0.115	-0.106	-0.012	-0.144	0.186	0.309

[1]Statistic not computed.

Table E22.4. Correlation matrix for monthly mean flow for station 06412000, Rapid Creek at Big Bend (October 1932 through September 1942)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.979	0.915	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Nov.	*	1.000	0.946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Dec.	*	*	1.000	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Jan.	*	*	*	1.000	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Feb.	*	*	*	*	1.000	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Mar.	*	*	*	*	*	1.000	(1)	(1)	(1)	(1)	(1)	(1)
Apr.	*	*	*	*	*	*	1.000	0.973	0.644	0.683	0.781	0.815
May	*	*	*	*	*	*	*	1.000	0.682	0.701	0.786	0.813
June	*	*	*	*	*	*	*	*	1.000	0.969	0.946	0.860
July	*	*	*	*	*	*	*	*	*	1.000	0.934	0.901
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.964
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

[1]Statistic not computed.

Table E22.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06412000, Rapid Creek at Big Bend

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1939	2.20	2	2.40	2	2.63	2	3.22	2	4.50	2	7.48	2	7.99	2	8.68	2	10.0	2
1940	1.30	1	1.43	1	1.77	1	1.86	1	2.48	1	4.82	1	6.34	1	7.20	1	8.20	1
1941	8.00	3	8.00	3	8.00	3	8.36	3	9.00	3	9.68	3	10.6	3	11.8	3	14.9	3

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E22.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06412000, Rapid Creek at Big Bend

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1940	60.0	3	37.3	3	33.9	3	31.6	3	27.7	3	24.1	3	21.5	3	19.1	3	16.8	3
1941	486	1	418	1	326	2	221	2	152	2	98.5	2	84.6	2	72.4	2	56.1	2
1942	389	2	375	2	363	1	318	1	256	1	191	1	155	1	131	1	96.2	1

Table E23.1. Mean flow, in cubic feet per second, for station 06412500, Rapid Creek above Canyon Lake, near Rapid City

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	43.1	44.5	(2)
1947	54.8	37.9	24.5	26.2	26.7	37.8	92.1	90.7	251	191	66.7	41.1	78.5
1948	30.1	26.9	28.8	25.1	27.6	39.7	66.1	52.8	58.4	71.5	58.4	32.6	43.2
1949	35.9	29.6	18.4	17.3	18.8	31.7	81.2	64.8	105	44.0	29.1	24.5	41.7
1950	26.9	18.0	9.29	11.6	11.0	17.8	91.2	109	51.9	49.9	27.2	23.4	37.4
1951	19.3	12.2	14.1	12.3	13.0	18.1	24.5	36.8	51.6	33.9	34.0	29.9	25.0
1952	21.0	13.2	7.15	9.42	9.38	17.0	59.7	287	126	53.7	37.5	29.5	56.1
1953	25.8	14.0	13.0	17.7	17.8	26.7	33.5	83.4	73.3	38.4	34.3	19.2	33.2
1954	17.3	11.9	9.77	8.61	15.3	18.1	31.9	33.1	28.1	34.8	36.5	16.6	21.9
1955	8.72	7.10	4.35	3.42	5.39	8.42	50.5	53.7	46.2	46.5	40.3	25.9	25.1
1956	12.9	6.47	7.40	6.23	6.76	27.6	25.7	38.5	48.6	35.5	29.4	11.5	21.4
1957	16.5	5.33	4.10	2.81	2.57	1.89	1.36	42.3	27.0	23.1	32.7	28.2	15.8
1958	10.3	3.86	2.71	2.82	2.66	4.23	3.67	26.1	35.7	28.7	28.4	27.0	14.7
1959	19.5	11.7	4.23	1.55	2.96	6.84	22.7	42.1	33.7	47.5	51.5	25.2	22.6
1960	9.89	2.09	3.11	1.13	1.48	2.42	8.52	33.0	27.8	52.3	46.6	29.6	18.3
1961	20.7	14.4	2.47	2.19	2.62	2.40	15.1	31.4	67.7	64.6	23.9	20.5	22.4
1962	7.45	3.68	.64	.81	1.73	2.47	4.94	36.0	78.7	48.5	33.2	20.0	19.9
[3]1963	5.77	5.09	3.35	1.85	3.71	2.86	8.82	26.2	77.6	119	52.0	35.9	28.7
1964	27.5	14.8	8.84	6.94	12.0	15.4	56.5	95.3	181	112	70.0	35.9	53.0
1965	35.1	18.5	15.4	13.3	13.0	20.3	66.6	263	445	186	95.4	69.6	104
1966	89.7	36.3	24.2	19.1	20.0	62.4	70.5	76.1	61.7	50.6	27.0	23.3	46.9
1967	24.9	16.5	10.2	10.5	10.0	29.4	46.1	80.0	251	182	73.8	61.4	66.5
1968	29.3	17.2	12.6	15.6	12.0	26.7	27.3	43.3	48.0	50.2	41.6	22.4	29.0
1969	16.5	12.6	8.60	8.08	10.7	13.5	31.2	70.7	55.2	48.8	47.5	39.9	30.4
1970	12.5	11.1	8.60	8.50	12.7	10.7	32.8	140	131	80.2	62.7	56.8	47.5
1971	19.8	15.3	9.23	10.6	10.4	23.7	157	212	162	74.1	72.0	41.5	67.5
1972	14.1	16.5	12.1	10.9	16.3	56.5	38.0	49.5	330	149	90.5	57.0	69.8
1973	46.5	22.8	19.3	19.1	18.3	13.2	42.7	132	89.8	87.0	60.0	40.7	49.5
1974	14.9	14.0	9.29	7.54	10.4	9.09	10.1	52.9	42.9	84.5	52.8	23.0	27.8
1975	7.61	4.60	8.71	7.13	8.00	9.25	15.4	30.8	60.2	61.9	54.8	42.7	26.0
1976	10.2	7.79	9.90	11.7	11.5	13.2	13.5	33.1	165	71.2	49.6	41.9	36.5
1977	12.7	11.4	11.7	11.1	11.9	17.0	84.2	112	68.5	70.6	40.1	22.4	39.6
1978	7.16	7.05	6.51	7.06	10.3	17.6	14.1	266	177	63.7	44.8	34.6	55.0
1979	32.4	18.6	15.6	15.5	27.8	32.9	37.7	51.3	83.1	55.1	41.7	34.5	37.2
1980	18.3	20.9	20.7	19.4	13.3	9.77	30.3	70.5	48.3	81.9	57.1	22.6	34.6
1981	6.43	5.33	4.66	5.67	6.39	5.55	10.0	60.9	32.1	75.1	33.1	43.7	24.2
1982	3.82	.71	6.48	3.82	5.55	4.84	4.28	28.0	30.7	134	107	77.4	34.2
1983	42.6	19.6	15.1	20.4	21.1	36.5	78.7	186	96.4	75.8	42.7	24.6	55.2
1984	10.7	10.4	10.5	18.8	15.2	13.4	56.5	153	135	80.5	65.0	34.3	50.4
1985	15.1	23.2	23.9	26.7	20.9	37.4	42.8	87.7	48.5	93.3	42.0	21.4	40.5
1986	8.34	7.08	7.89	6.98	8.86	8.95	17.3	22.0	42.3	33.4	44.5	22.8	19.2
1987	49.2	44.2	21.6	13.5	14.5	24.9	61.9	55.1	44.7	65.8	45.1	24.8	38.9
1988	9.00	6.36	5.18	6.21	6.94	10.7	19.6	48.4	82.8	101	64.8	45.9	34.0
1989	6.67	6.01	6.81	6.44	5.15	5.96	8.67	47.5	77.3	75.5	55.3	14.1	26.5
1990	5.61	7.03	6.44	6.71	4.86	4.09	4.46	40.1	20.7	71.3	36.0	18.4	19.0
1991	1.38	1.20	.12	.094	.094	.29	3.55	30.2	45.9	42.3	54.2	29.2	17.5
1992	8.06	7.31	5.87	9.81	10.3	10.7	10.4	55.1	31.1	23.2	50.1	25.0	20.7
1993	13.0	5.49	6.54	8.89	9.27	11.6	11.6	31.2	217	142	60.5	62.5	48.3

[1]Indicates a no-value month.

[2]Incomplete water year.

[3]Pactola Reservoir filled during water year 1963.

Table E23.2. Statistics on mean flow, in cubic feet per second, for station 06412500, Rapid Creek above Canyon Lake, near Rapid City (October 1963 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	30	30	30	30	30	30	30	30	30	30	30	30	30
Maximum	89.7	44.2	24.2	26.7	27.8	62.4	157	266	445	186	107	77.4	104
Percentile													
75th	27.9	18.5	15.2	15.5	14.7	25.3	56.5	117	163	95.2	64.8	44.2	51.0
50th	13.5	12.0	9.26	10.2	11.1	13.3	30.7	58.0	72.9	75.3	53.5	34.5	38.0
25th	7.95	6.86	6.53	6.97	8.65	9.21	11.3	42.5	45.6	60.2	42.5	22.9	27.5
Minimum	1.38	0.71	0.12	0.094	0.094	0.29	3.55	22.0	20.7	23.2	27.0	14.1	17.5
Mean	19.97	13.66	11.09	11.20	11.92	18.52	36.79	87.46	110.14	84.07	56.06	37.14	41.65
Standard deviation	18.39	9.60	5.97	5.89	5.70	14.69	32.79	67.68	97.63	39.69	18.29	16.42	18.77
Skewness	2.20	1.44	0.82	0.72	0.68	1.58	1.85	1.52	1.93	1.19	1.10	0.83	1.34
Coefficient of variation	0.92	0.70	0.54	0.53	0.48	0.79	0.89	0.77	0.89	0.47	0.33	0.44	0.45
Percent of annual flow	4.01	2.74	2.23	2.25	2.39	3.72	7.39	17.56	22.12	16.88	11.26	7.46	[1]0.386

[1]Serial correlation for annual mean flows.

Table E23.3. Serial correlation for 1-year lag for monthly mean flow for station 06412500, Rapid Creek above Canyon Lake, near Rapid City (October 1963 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.149	0.020	0.038	0.138	0.187	0.153	0.127	0.125	0.096	-0.140	-0.206	-0.108

Table E23.4. Correlation matrix for monthly mean flow for station 06412500, Rapid Creek above Canyon Lake, near Rapid City (October 1963 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.845	0.748	0.567	0.630	0.680	0.480	0.202	0.087	0.010	-0.211	-0.127
Nov.	*	1.000	0.883	0.674	0.667	0.663	0.508	0.169	0.049	0.015	-0.211	-0.245
Dec.	*	*	1.000	0.873	0.781	0.644	0.427	0.172	0.029	0.058	-0.178	-0.222
Jan.	*	*	*	1.000	0.822	0.588	0.428	0.273	0.037	0.013	-0.219	-0.261
Feb.	*	*	*	*	1.000	0.711	0.428	0.264	0.134	0.001	-0.179	-0.120
Mar.	*	*	*	*	*	1.000	0.475	0.165	0.309	0.164	-0.070	-0.025
Apr.	*	*	*	*	*	*	1.000	0.576	0.285	0.108	0.091	-0.014
May	*	*	*	*	*	*	*	1.000	0.503	0.214	0.181	0.153
June	*	*	*	*	*	*	*	*	1.000	0.758	0.603	0.612
July	*	*	*	*	*	*	*	*	*	1.000	0.738	0.734
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.771
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E23.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06412500, Rapid Creek above Canyon Lake, near Rapid City

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1964	8.00	28	8.33	26	8.93	26	9.46	23	10.6	22	12.7	23	13.7	22	14.4	22	19.4	23
1965	5.00	16	12.7	29	15.0	29	17.5	29	19.1	29	19.4	29	20.2	28	23.7	29	41.3	29
1966	5.00	17	5.17	16	6.00	16	7.50	17	8.97	17	9.42	16	10.1	16	11.1	17	14.9	18
1967	5.00	18	6.00	18	6.57	18	7.50	18	9.43	19	12.3	22	13.0	21	14.0	21	19.0	22
1968	6.00	22	6.17	19	6.71	19	7.07	16	7.78	16	7.93	12	9.04	14	9.88	15	11.7	15
1969	5.00	19	5.50	17	5.79	15	6.36	15	7.47	14	8.18	14	9.09	15	9.68	13	10.8	13
1970	7.00	23	7.33	23	7.79	21	7.93	19	9.07	18	9.75	17	10.1	17	11.0	16	14.9	19
1971	.45	5	.95	5	6.15	17	9.29	21	10.6	23	11.1	19	12.7	20	13.2	20	18.1	21
1972	7.00	24	7.00	21	7.43	20	8.64	20	13.1	25	15.7	26	16.8	26	17.4	24	23.4	25
1973	2.40	11	2.50	10	2.69	7	2.77	6	5.62	12	8.06	13	8.63	12	9.02	12	11.0	14
1974	.10	4	2.87	12	3.77	12	4.13	12	4.50	9	5.67	8	6.57	9	6.64	8	7.63	7
1975	3.50	14	4.13	14	4.63	14	5.38	14	7.62	15	8.30	15	8.79	13	9.72	14	10.7	12
1976	5.60	20	7.10	22	7.99	22	10.3	26	10.9	24	11.3	20	11.3	19	11.4	18	12.8	16
1977	2.50	12	3.10	13	3.27	10	3.48	8	3.93	6	6.11	9	6.01	7	6.55	7	9.30	10
1978	7.30	25	9.50	28	10.1	27	10.8	27	13.3	27	14.7	25	16.2	25	19.1	27	23.8	26
1979	7.50	26	8.17	24	8.50	23	9.57	24	9.73	20	11.5	21	14.1	23	15.8	23	17.1	20
1980	1.00	9	1.43	7	2.04	4	2.36	4	3.57	4	4.62	4	4.83	3	5.30	3	5.68	3
1981	.040	3	.11	3	.15	2	.36	2	.60	2	1.19	2	3.12	2	3.28	2	4.34	2
1982	2.60	13	2.73	11	2.91	9	3.54	9	4.28	8	15.8	27	17.4	27	18.3	25	25.1	27
1983	7.60	27	8.27	25	8.86	25	9.38	22	9.92	21	10.3	18	10.4	18	12.2	19	12.8	17
1984	8.00	29	9.33	27	11.0	28	11.4	28	14.7	28	18.9	28	20.5	29	22.2	28	22.9	24
1985	4.00	15	4.20	15	4.54	13	5.29	13	6.14	13	6.71	11	6.93	11	7.25	10	8.01	8
1986	5.80	21	6.57	20	8.71	24	10.1	25	13.1	26	13.7	24	15.0	24	18.5	26	27.1	28
1987	2.00	10	2.00	9	2.07	5	2.46	5	3.58	5	4.99	5	5.45	5	5.75	5	7.40	6
1988	.87	8	1.09	6	2.10	6	4.07	11	4.72	10	5.49	6	5.83	6	6.03	6	6.28	5
1989	.78	7	.81	4	2.74	8	3.29	7	4.06	7	4.46	3	5.23	4	5.52	4	5.79	4
1990	.0000	1	.0000	1	.0000	1	.0000	1	.020	1	.061	1	.093	1	.15	1	.59	1
1991	.0000	2	.020	2	.16	3	1.47	3	3.55	3	6.40	10	6.91	10	7.66	11	8.66	9
1992	.66	6	1.72	8	3.39	11	4.05	10	4.92	11	5.54	7	6.30	8	7.16	9	9.32	11

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E23.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06412500, Rapid Creek above Canyon Lake, near Rapid City

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1964	261	9	247	9	239	9	228	8	208	7	149	7	131	7	117	7	91.6	6
1965	562	2	553	2	543	2	516	2	450	1	383	1	305	1	250	1	187	1
1966	134	15	133	15	124	15	118	15	91.4	17	79.8	16	75.4	18	69.7	16	58.2	17
1967	435	3	434	3	429	3	414	3	320	4	218	5	174	4	149	4	116	4
1968	76.0	29	67.3	30	60.1	30	60.0	29	53.9	29	49.6	28	48.6	26	46.2	27	40.2	26
1969	121	20	119	20	117	18	90.1	23	72.3	24	63.5	22	58.8	23	55.5	24	49.0	21
1970	240	10	236	11	226	11	175	11	142	11	137	10	121	10	107	10	84.1	10
1971	382	5	364	5	324	5	298	5	260	5	222	4	178	3	152	3	121	2
1972	2,600	1	1,705	1	902	1	529	1	349	3	250	2	191	2	158	2	119	3
1973	173	13	172	13	167	13	159	12	136	13	114	13	106	12	96.6	11	75.6	11
1974	113	24	101	23	101	23	97.5	20	88.2	19	75.3	19	62.4	21	59.5	20	44.7	23
1975	73.0	30	72.0	29	70.9	28	66.9	28	62.1	26	61.6	23	59.9	22	57.5	23	44.4	24
1976	376	6	284	7	276	7	262	7	182	9	120	12	97.3	13	84.8	14	62.2	14
1977	192	12	191	12	185	12	142	14	129	14	105	14	93.3	14	86.1	13	66.4	12
1978	433	4	430	4	427	4	412	4	354	2	227	3	172	5	140	5	100	5
1979	132	16	125	17	121	16	106	18	87.1	20	71.6	21	65.3	20	59.3	21	50.6	20
1980	114	23	111	22	104	22	95.4	21	91.3	18	72.8	20	72.2	19	68.0	18	52.1	18
1981	126	18	126	16	114	20	104	19	83.2	21	55.5	25	57.3	24	50.3	25	42.7	25
1982	155	14	149	14	147	14	146	13	138	12	122	11	109	11	88.9	12	64.0	13
1983	276	8	275	8	264	8	220	9	195	8	147	8	126	8	110	9	87.1	9
1984	240	11	237	10	228	10	202	10	155	10	145	9	126	9	111	8	87.9	7
1985	126	19	125	18	118	17	115	16	95.1	16	75.7	18	78.4	16	69.1	17	59.0	16
1986	83.0	27	76.0	28	69.1	29	51.8	30	45.5	30	39.7	30	40.1	29	36.4	30	30.4	30
1987	82.0	28	81.0	26	77.1	26	72.7	25	66.6	25	59.5	24	56.9	25	58.1	22	50.7	19
1988	121	21	120	19	116	19	107	17	106	15	95.7	15	84.4	15	77.4	15	60.6	15
1989	104	25	99.7	24	94.7	24	87.1	24	81.7	22	77.4	17	76.1	17	65.3	19	46.6	22
1990	116	22	114	21	111	21	93.2	22	73.5	23	55.3	26	46.4	28	42.8	28	32.1	29
1991	128	17	97.3	25	83.1	25	67.3	27	56.2	28	53.1	27	48.2	27	47.4	26	34.3	27
1992	91.0	26	78.7	27	73.3	27	70.6	26	58.6	27	44.5	29	37.2	30	40.8	29	32.6	28
1993	315	7	301	6	299	6	286	6	255	6	184	6	142	6	122	6	87.3	8

Table E24.1. Mean flow, in cubic feet per second, for station 06414000, Rapid Creek at Rapid City

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1903	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	163	117	75	73	(2)
1904	63	52	39	34	34	58	120	142	434	175	81.3	88.0	110
1905	86.8	85.5	71.6	55	55	72.5	83.2	173	131	359	195	102	123
1906	84.2	80	50	50	50	75	67.7	126	148	74.3	166	87.1	88.5
1907	81.7	70.5	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
1942	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	78.5	50.7	42.5	(2)
1943	47.2	47.0	37.1	38.7	47.5	90.9	202	102	274	114	45.5	40.9	90.3
1944	42.0	47.5	36.7	35.5	43.0	46.0	95.4	98.8	131	77.8	40.9	38.0	61.0
1945	46.0	47.0	34.1	33.8	37.3	57.5	65.7	60.6	115	74.5	69.4	43.8	57.1
1946	43.1	40.2	33.6	37.3	32.6	43.5	54.4	225	296	177	65.0	69.0	93.3
1947	74.7	57.9	52.8	52.7	55.6	60.5	108	115	288	209	81.1	59.3	101
1948	52.6	54.8	53.2	44.8	47.9	62.3	85.5	72.5	83.6	95.4	78.4	52.6	65.3
1949	57.1	53.2	40.2	37.6	44.8	62.4	110	92.0	123	66.6	53.2	48.7	65.7
1950	50.7	47.8	36.3	35.1	35.5	40.9	110	136	68.9	68.0	46.7	47.9	60.4
1951	36.5	34.5	32.5	30.9	34.4	39.8	42.2	56.0	75.6	53.2	52.7	57.4	45.5
1952	48.0	37.0	33.1	33.6	34.9	40.5	77.1	303	139	67.3	49.7	40.9	75.6
1953	41.7	31.6	30.3	35.6	35.1	47.9	59.9	107	101	53.9	50.8	33.1	52.4
1954	35.4	32.2	29.6	25.9	36.3	42.0	52.3	49.2	48.8	43.9	49.7	27.8	39.4
1955	26.1	29.2	25.1	22.5	26.9	30.9	63.6	62.5	63.5	59.4	55.2	36.0	41.8
1956	32.8	25.5	26.5	29.9	24.0	41.0	41.0	51.2	53.1	43.5	41.2	22.3	36.1
1957	27.1	28.4	20.5	17.7	18.1	15.1	13.8	73.4	50.9	43.2	42.8	41.0	32.8
1958	25.7	21.5	23.3	24.6	19.9	21.9	20.0	38.1	53.7	46.3	33.3	33.5	30.2
1959	29.3	27.1	21.8	18.6	18.0	16.4	31.3	54.5	39.0	52.5	52.8	34.2	33.1
1960	25.9	13.6	15.7	15.4	16.2	19.3	21.7	43.6	41.2	54.6	49.7	33.7	29.3
1961	27.4	28.8	18.7	17.8	17.6	16.3	26.7	40.8	67.2	62.8	18.9	24.6	30.7
1962	16.4	17.1	11.7	10.5	13.5	16.3	13.0	52.4	120	86.8	34.4	27.8	35.1
[3]1963	24.6	22.8	17.3	16.3	19.0	21.2	27.6	40.1	106	121	55.1	54.8	43.9
1964	39.0	30.8	29.6	29.8	27.6	31.1	65.6	107	190	115	73.8	46.0	65.5
1965	49.6	33.8	32.5	32.5	32.7	37.7	78.9	321	487	198	95.6	82.8	124
1966	98.4	58.5	45.8	36.0	40.0	75.7	90.4	83.5	65.0	62.7	42.4	36.3	61.4
1967	41.9	35.2	27.2	26.6	25.1	43.2	64.9	94.5	293	185	77.8	74.3	82.5
1968	46.9	39.1	36.2	34.4	36.3	45.5	43.7	54.0	69.4	52.8	52.0	35.3	45.5
1969	29.0	32.4	20.4	26.0	29.2	31.5	42.4	85.4	65.7	62.1	45.3	52.2	43.5
1970	26.8	26.8	23.7	20.8	27.6	27.7	47.1	157	154	80.2	68.2	66.7	60.7
1971	32.0	32.2	24.8	23.1	31.4	32.9	182	230	175	83.2	73.3	58.6	81.6
1972	34.4	38.5	32.9	30.5	31.2	72.9	55.1	63.0	449	169	101	72.3	95.5
1973	65.7	41.9	37.4	38.1	36.4	31.7	66.8	158	98.7	98.1	62.2	61.9	66.6
1974	35.5	35.5	33.3	28.2	28.7	27.7	28.7	59.9	47.3	90.9	64.7	36.4	43.3
1975	24.6	22.3	23.3	21.5	21.5	24.8	33.5	46.9	86.5	71.1	60.3	51.2	40.7
1976	25.2	26.3	27.1	26.4	26.6	29.4	30.5	52.6	191	98.1	67.9	55.4	54.6
1977	29.9	30.1	34.1	20.9	29.1	43.6	120	119	78.6	79.7	54.2	37.2	56.4
1978	30.3	27.8	33.0	15.9	15.9	31.7	31.3	253	196	77.6	59.3	44.5	68.4
1979	49.8	40.1	36.4	34.5	48.9	48.5	56.9	65.7	83.5	65.1	61.7	40.1	52.6
1980	34.7	38.2	36.3	37.7	28.9	29.1	49.3	79.6	52.3	71.4	66.5	34.7	46.7
1981	23.0	25.5	24.8	24.0	25.7	22.8	17.6	90.8	36.0	84.5	39.5	56.6	39.4
1982	22.1	20.8	23.5	22.6	23.5	23.8	23.1	54.2	52.9	153	126	95.5	53.7
1983	67.0	36.1	38.4	37.8	36.0	52.0	97.9	199	106	80.8	54.6	37.2	70.5
1984	30.1	35.1	34.9	40.2	32.9	32.8	74.5	166	153	93.4	90.6	60.3	70.4
1985	38.8	35.5	39.9	44.8	44.9	57.6	61.0	98.3	57.7	90.5	54.3	34.4	55.0
1986	27.6	26.1	26.2	27.8	30.3	30.2	40.7	42.7	53.3	45.8	51.2	48.3	37.5
1987	72.3	65.9	43.6	34.6	30.5	41.4	79.4	76.7	51.7	66.7	62.7	44.9	56.0
1988	26.0	28.2	24.8	26.2	26.7	27.5	30.8	61.5	67.2	85.9	59.4	42.2	42.3
1989	15.4	23.0	24.1	23.2	21.1	25.1	22.5	49.5	77.1	74.3	60.0	26.5	36.9
1990	24.0	23.3	20.8	18.8	19.1	19.8	18.1	55.1	28.0	73.5	46.4	28.4	31.5
1991	17.2	21.6	20.1	19.3	20.7	18.3	24.5	60.5	68.9	53.6	65.7	42.9	36.2
1992	24.4	26.5	25.1	27.5	31.2	30.5	28.7	69.5	45.0	46.0	63.7	42.6	38.5
1993	31.3	21.8	20.8	24.5	26.1	29.6	40.0	62.7	261	160	77.9	81.5	69.8

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Pactola Reservoir filled during water year 1963.

Table E24.2. Statistics on mean flow, in cubic feet per second, for station 06414000, Rapid Creek at Rapid City (October 1963 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	30	30	30	30	30	30	30	30	30	30	30	30	30
Maximum	98.4	65.9	45.8	44.8	48.9	75.7	182	321	487	198	126	95.5	124
Percentile													
75th	43.2	36.6	36.2	34.5	32.7	43.3	68.7	128	179	98.1	73.4	60.7	68.7
50th	30.8	31.5	28.4	27.0	29.0	31.3	45.4	78.1	77.9	80.5	62.4	45.4	54.8
25th	25.0	25.9	24.0	23.0	25.5	27.6	30.0	58.7	53.2	66.3	54.3	37.0	41.9
Minimum	15.4	20.8	20.1	15.9	15.9	18.3	17.6	42.7	28.0	45.8	39.5	26.5	31.5
Mean	37.10	32.63	30.03	28.47	29.53	35.87	54.86	103.89	127.99	92.27	65.94	50.91	57.57
Standard deviation	18.27	10.16	7.21	7.20	7.20	14.02	35.01	69.00	114.61	40.45	18.39	17.25	20.10
Skewness	1.77	1.68	0.42	0.40	0.70	1.52	1.90	1.73	1.98	1.41	1.46	0.90	1.41
Coefficient of variation	0.49	0.31	0.24	0.25	0.24	0.39	0.64	0.66	0.90	0.44	0.28	0.34	0.35
Percent of annual flow	5.38	4.73	4.36	4.13	4.28	5.20	7.96	15.07	18.56	13.38	9.56	7.38	[1]0.364

[1]Serial correlation for annual mean flows.

Table E24.3. Serial correlation for 1-year lag for monthly mean flow for station 06414000, Rapid Creek at Rapid City (October 1963 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.125	0.091	0.167	0.358	-0.021	0.099	0.070	0.079	0.059	-0.101	-0.301	-0.069

Table E24.4. Correlation matrix for monthly mean flow for station 06414000, Rapid Creek at Rapid City (October 1963 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.866	0.807	0.615	0.603	0.676	0.446	0.224	0.045	0.006	-0.177	-0.101
Nov.	*	1.000	0.844	0.641	0.574	0.652	0.427	0.090	-0.009	-0.088	-0.148	-0.187
Dec.	*	*	1.000	0.754	0.657	0.708	0.402	0.220	-0.009	-0.077	-0.115	-0.282
Jan.	*	*	*	1.000	0.807	0.556	0.270	0.077	0.002	0.019	0.001	-0.128
Feb.	*	*	*	*	1.000	0.659	0.415	0.074	-0.032	-0.090	-0.111	-0.127
Mar.	*	*	*	*	*	1.000	0.429	0.077	0.298	0.156	-0.016	-0.065
Apr.	*	*	*	*	*	*	1.000	0.536	0.219	0.077	0.051	0.043
May	*	*	*	*	*	*	*	1.000	0.487	0.285	0.179	0.257
June	*	*	*	*	*	*	*	*	1.000	0.807	0.566	0.614
July	*	*	*	*	*	*	*	*	*	1.000	0.722	0.773
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.758
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E24.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06414000, Rapid Creek at Rapid City

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1964	10.0	5	13.3	7	27.4	25	29.2	25	30.3	24	31.5	22	32.2	21	32.2	19	36.6	21
1965	23.0	23	23.0	22	26.0	24	30.1	27	34.6	28	37.7	29	39.8	29	43.8	29	58.9	29
1966	20.0	19	21.0	20	22.4	18	23.5	18	24.9	17	25.6	16	25.8	14	27.2	16	31.5	17
1967	25.0	26	29.7	28	30.4	28	32.6	28	33.4	27	34.5	25	35.3	24	36.0	24	39.8	23
1968	15.0	12	16.0	13	17.4	12	18.2	10	20.1	9	23.0	10	24.7	10	26.3	14	28.1	14
1969	15.0	13	15.3	10	16.4	10	17.7	8	19.3	8	22.1	8	23.3	8	24.1	8	25.7	7
1970	13.0	10	15.3	11	19.6	14	20.6	14	21.2	11	22.5	9	25.2	11	26.0	11	29.2	15
1971	18.0	16	19.3	18	24.3	20	25.8	20	29.0	22	30.6	20	31.5	19	33.1	21	36.8	22
1972	22.0	22	23.3	23	25.1	22	25.9	21	30.7	25	34.1	24	35.4	25	35.8	23	42.1	24
1973	20.0	20	20.7	19	22.0	17	22.6	16	26.8	19	28.0	18	28.1	18	29.4	18	31.7	18
1974	9.20	4	15.3	12	15.9	9	16.6	6	18.8	6	20.4	5	21.4	5	21.9	4	23.1	5
1975	18.0	17	18.7	16	20.0	15	22.9	17	24.6	16	25.5	15	25.9	15	26.1	12	26.8	11
1976	12.0	7	12.7	6	14.7	7	15.6	5	19.1	7	24.7	12	27.8	17	28.1	17	31.4	16
1977	8.60	3	8.60	2	8.60	1	9.05	1	12.5	1	15.8	1	20.4	3	23.0	6	25.9	8
1978	23.0	24	23.3	24	24.3	21	25.9	22	31.3	26	35.2	26	36.4	26	39.5	28	42.2	25
1979	23.0	25	24.0	25	25.9	23	26.8	23	28.0	20	28.6	19	31.9	20	32.8	20	34.2	20
1980	12.0	8	12.0	4	13.9	5	16.6	7	22.8	13	24.1	11	24.2	9	24.3	9	24.3	6
1981	6.70	1	8.53	1	10.7	2	14.2	3	17.6	4	20.8	6	21.8	6	22.0	5	22.8	4
1982	16.0	15	19.0	17	20.6	16	21.5	15	22.9	14	36.3	28	36.6	27	36.5	25	44.1	27
1983	25.0	27	26.0	26	27.4	26	28.6	24	28.9	21	31.1	21	32.2	22	33.6	22	33.8	19
1984	27.0	29	31.7	29	32.6	29	33.5	29	35.1	29	35.9	27	37.6	28	39.4	27	42.6	26
1985	21.0	21	22.7	21	23.0	19	23.9	19	24.9	18	26.1	17	26.4	16	26.9	15	28.0	13
1986	25.0	28	26.3	27	28.7	27	29.4	26	30.2	23	31.8	23	33.3	23	37.5	26	47.0	28
1987	15.0	14	16.0	14	17.0	11	20.0	13	22.1	12	24.7	13	25.6	13	26.2	13	26.6	10
1988	7.30	2	9.43	3	10.8	3	11.9	2	15.2	2	18.9	2	20.7	4	21.4	3	22.0	3
1989	12.0	9	13.3	8	15.6	8	17.9	9	18.7	5	19.0	3	19.3	1	19.6	2	21.0	2
1990	11.0	6	12.0	5	13.3	4	14.9	4	16.9	3	19.3	4	19.4	2	19.5	1	19.5	1
1991	13.0	11	13.7	9	14.3	6	18.6	11	24.3	15	25.3	14	25.2	12	25.5	10	27.4	12
1992	18.0	18	18.3	15	19.0	13	19.5	12	20.4	10	21.1	7	22.3	7	23.2	7	25.9	9

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E24.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06414000, Rapid Creek at Rapid City

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1964	250	12	246	11	241	11	237	8	215	8	157	10	140	8	123	8	99.6	8
1965	628	2	605	2	595	2	575	2	506	1	433	1	342	1	279	1	210	1
1966	142	23	139	19	128	18	119	16	101	16	95.2	15	87.4	15	80.0	15	70.4	16
1967	487	4	483	3	473	3	452	3	356	3	241	4	193	4	164	4	131	4
1968	110	28	93.3	30	79.4	30	72.4	29	70.2	29	62.9	27	59.6	27	57.4	27	53.0	25
1969	147	22	146	17	143	16	109	19	87.2	22	76.1	23	71.7	22	65.4	24	58.9	20
1970	332	9	318	8	299	8	217	10	162	12	159	9	135	10	118	10	95.7	10
1971	440	5	426	4	373	5	340	5	288	6	244	3	197	3	169	3	134	3
1972	5,600	1	2,500	1	1,321	1	745	1	478	2	322	2	241	2	199	2	152	2
1973	195	16	194	14	190	12	187	12	164	11	136	13	121	13	111	11	91.1	11
1974	163	18	128	21	116	19	111	18	94.8	17	81.4	18	69.2	25	66.7	22	54.9	23
1975	215	13	142	18	115	20	103	20	90.3	20	80.8	19	76.4	17	71.0	17	58.3	21
1976	488	3	390	6	343	6	301	7	219	7	150	11	125	12	107	13	82.4	14
1977	200	15	200	13	189	13	160	14	149	14	121	14	108	14	100	14	83.0	13
1978	408	6	399	5	388	4	382	4	334	4	228	5	178	5	148	5	111	6
1979	211	14	135	20	109	21	102	21	88.4	21	79.0	20	75.0	19	70.7	18	63.7	18
1980	125	25	118	23	108	23	95.6	22	85.2	23	72.3	24	71.3	23	70.7	19	59.4	19
1981	176	17	154	15	145	15	114	17	92.3	18	63.9	26	71.8	21	63.0	26	54.5	24
1982	370	8	230	12	183	14	162	13	157	13	141	12	126	11	108	12	84.5	12
1983	261	11	257	10	249	9	224	9	207	9	160	8	136	9	122	9	99.3	9
1984	273	10	269	9	246	10	216	11	168	10	161	7	141	7	129	7	106	7
1985	151	21	149	16	137	17	130	15	103	15	82.3	16	84.8	16	77.2	16	70.5	15
1986	154	20	94.3	28	84.3	29	65.9	30	54.9	30	51.2	30	50.6	30	49.8	30	47.0	29
1987	116	26	112	26	109	22	93.3	24	80.0	26	78.8	21	70.7	24	70.3	20	64.9	17
1988	134	24	120	22	103	24	94.6	23	91.4	19	81.5	17	75.6	18	69.4	21	58.0	22
1989	115	27	114	25	97.9	27	85.3	27	81.4	24	77.0	22	74.5	20	66.2	23	52.0	27
1990	108	29	104	27	98.0	26	86.5	25	74.2	27	60.7	28	53.4	29	51.5	29	41.9	30
1991	159	19	115	24	102	25	86.2	26	80.5	25	65.8	25	64.6	26	64.8	25	52.8	26
1992	104	30	94.0	29	89.9	28	84.9	28	72.9	28	59.4	29	54.2	28	56.9	28	49.4	28
1993	376	7	352	7	338	7	329	6	299	5	214	6	168	6	146	6	114	5

Table E25.1. Mean flow, in cubic feet per second, for station 06418900, Rapid Creek below Sewage Plant, near Rapid City

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1982	20.6	23.7	35.5	31.4	36.1	39.7	37.1	74.0	63.8	163	153	96.5	64.8
1983	99.3	64.8	60.7	52.2	52.9	75.3	120	237	89.5	57.7	39.4	25.8	81.5
1984	33.5	42.1	41.2	55.5	48.9	49.4	103	177	180	87.9	62.3	28.8	75.8
1985	33.7	53.1	50.4	54.1	54.6	75.5	71.4	53.8	32.7	54.3	38.0	26.3	49.8
1986	31.7	36.4	38.6	43.5	54.0	48.5	74.7	62.5	59.1	41.8	33.4	58.9	48.4
1987	98.9	91.3	60.4	50.9	46.1	71.8	98.3	68.3	46.1	43.8	41.1	25.1	61.9
1988	21.8	37.4	36.4	43.8	42.5	44.4	31.1	41.4	40.9	46.2	38.7	25.7	37.5
1989	27.7	37.1	36.9	36.5	33.5	41.2	32.9	30.5	36.2	41.4	40.8	30.7	35.5
1990	36.4	37.3	34.6	35.7	35.7	35.7	35.3	55.1	63.4	44.7	34.1	22.2	39.2
1991	18.7	27.8	31.5	28.8	32.7	32.3	51.4	86.5	97.8	32.3	37.5	47.4	43.7
1992	34.7	41.4	46.4	53.3	45.5	50.3	39.7	50.5	34.8	44.0	35.1	30.5	42.2
1993	28.5	26.9	32.6	38.2	44.7	58.7	64.6	89.6	293	193	107	100	89.7

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E25.2. Statistics on mean flow, in cubic feet per second, for station 06418900, Rapid Creek below Sewage Plant, near Rapid City (October 1981 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	12	12	12	12	12	12	12	12	12	12	12	12	12
Maximum	99.3	91.3	60.7	55.5	54.6	75.5	120	237	293	193	153	100	89.7
Percentile													
75th	36.0	50.3	49.4	53.0	51.9	68.5	92.4	88.8	95.7	80.3	57.0	56.0	73.1
50th	32.6	37.3	37.7	43.7	45.1	48.9	58.0	65.4	61.2	45.4	39.0	29.6	49.1
25th	23.3	29.9	34.8	35.9	35.8	40.1	35.7	51.3	37.4	42.3	35.7	25.7	39.9
Minimum	18.7	23.7	31.5	28.8	32.7	32.3	31.1	30.5	32.7	32.3	33.4	22.2	35.5
Mean	40.46	43.27	42.10	43.66	43.93	51.90	63.29	85.52	86.44	70.84	55.03	43.16	55.83
Standard deviation	27.99	18.87	10.19	9.45	7.94	15.18	30.66	60.62	76.95	52.30	37.12	27.83	18.52
Skewness	1.86	1.71	1.04	-0.19	-0.11	0.59	0.66	1.89	2.16	1.85	2.20	1.53	0.70
Coefficient of variation	0.69	0.44	0.24	0.22	0.18	0.29	0.48	0.71	0.89	0.74	0.67	0.64	0.33
Percent of annual flow	6.04	6.46	6.29	6.52	6.56	7.75	9.45	12.77	12.91	10.58	8.22	6.45	[1]0.361

[1]Serial correlation for annual mean flows.

Table E25.3. Serial correlation for 1-year lag for monthly mean flow for station 06418900, Rapid Creek below Sewage Plant, near Rapid City (October 1981 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.303	-0.264	-0.270	0.103	0.502	-0.042	0.288	0.372	-0.232	-0.032	-0.148	-0.255

Table E25.4. Correlation matrix for monthly mean flow for station 06418900, Rapid Creek below Sewage Plant, near Rapid City (October 1981 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.898	0.891	0.506	0.423	0.720	0.736	0.519	-0.110	-0.215	-0.261	-0.372
Nov.	*	1.000	0.915	0.639	0.461	0.749	0.647	0.251	-0.289	-0.390	-0.413	-0.556
Dec.	*	*	1.000	0.751	0.617	0.850	0.705	0.424	-0.299	-0.303	-0.320	-0.482
Jan.	*	*	*	1.000	0.817	0.731	0.624	0.368	-0.087	-0.247	-0.382	-0.526
Feb.	*	*	*	*	1.000	0.778	0.701	0.400	0.069	-0.053	-0.232	-0.165
Mar.	*	*	*	*	*	1.000	0.722	0.387	0.051	0.028	-0.136	-0.195
Apr.	*	*	*	*	*	*	1.000	0.791	0.282	-0.013	-0.139	-0.180
May	*	*	*	*	*	*	*	1.000	0.399	0.145	0.060	-0.070
June	*	*	*	*	*	*	*	*	1.000	0.714	0.445	0.550
July	*	*	*	*	*	*	*	*	*	1.000	0.916	0.854
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.847
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E25.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06418900, Rapid Creek below Sewage Plant, near Rapid City

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1982	24.0	11	27.0	11	31.0	11	33.4	11	36.0	11	51.9	11	53.8	11	56.8	11	66.6	11
1983	17.0	6	18.0	6	18.9	5	22.2	7	24.7	6	28.4	6	32.7	6	34.6	7	39.2	7
1984	20.0	10	20.7	10	22.4	10	26.9	9	28.7	8	30.6	8	37.3	8	40.6	9	45.0	9
1985	16.0	4	17.0	5	18.1	3	18.5	3	24.6	5	26.7	5	30.4	5	31.6	5	35.2	6
1986	17.0	7	18.3	7	21.3	9	23.9	8	33.3	10	36.7	10	41.2	10	46.1	10	54.9	10
1987	18.0	8	18.3	8	18.6	4	18.9	4	21.3	3	23.2	2	26.5	2	29.5	4	33.2	4
1988	19.0	9	19.7	9	20.0	6	21.7	5	22.9	4	23.7	3	26.6	3	29.3	3	31.6	3
1989	16.0	5	16.3	3	20.0	7	21.7	6	25.9	7	29.3	7	32.7	7	33.9	6	34.7	5
1990	12.0	2	12.7	2	13.4	1	15.3	2	17.8	1	20.3	1	22.6	1	24.9	1	26.8	1
1991	15.0	3	16.7	4	20.7	8	29.9	10	32.0	9	34.4	9	38.9	9	37.8	8	39.8	8
1992	11.0	1	11.7	1	14.6	2	15.1	1	19.8	2	26.4	4	27.8	4	29.1	2	30.0	2

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E25.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06418900, Rapid Creek below Sewage Plant, near Rapid City

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1982	636	1	342	4	238	4	214	4	181	4	160	4	139	4	120	4	98.4	4
1983	386	4	340	5	309	3	280	2	248	2	181	3	151	3	133	3	106	3
1984	462	2	401	1	316	2	254	3	191	3	182	2	158	2	140	2	110	2
1985	119	12	105	11	102	9	93.9	8	87.4	8	75.6	7	68.2	7	64.5	8	60.3	6
1986	229	6	162	7	109	8	88.9	9	83.1	9	72.1	8	66.6	8	64.7	7	57.3	8
1987	167	11	131	10	122	7	112	7	101	6	95.8	5	84.1	5	75.9	5	71.3	5
1988	178	10	144	8	90.1	10	64.1	11	57.6	10	50.8	11	45.6	11	43.5	11	43.0	11
1989	206	8	100	12	75.0	12	51.9	12	44.4	12	41.7	12	40.8	12	38.9	12	37.4	12
1990	349	5	343	3	225	5	142	6	90.6	7	63.8	9	55.7	9	50.5	9	45.4	10
1991	200	9	185	6	174	6	143	5	125	5	95.0	6	79.3	6	67.9	6	58.7	7
1992	223	7	137	9	88.1	11	70.5	10	56.2	11	52.1	10	50.4	10	49.1	10	47.8	9
1993	401	3	384	2	364	1	354	1	323	1	247	1	199	1	174	1	141	1

Table E26.1. Mean flow, in cubic feet per second, for station 06421500, Rapid Creek near Farmingdale

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	37.5	68.1	(2)
1947	106	70.2	53.0	54.5	53.7	71.2	123	77.4	378	199	47.0	17.5	104
1948	41.8	49.7	55.5	43.0	55.4	69.2	74.2	47.7	92.8	75.2	46.2	10.8	55.1
1949	23.5	58.4	46.4	20.8	45.9	145	151	78.8	129	24.3	17.2	27.7	63.9
1950	45.6	48.3	39.9	35.8	40.1	57.4	158	144	11.3	11.0	20.3	25.6	53.1
1951	41.6	40.7	38.6	33.6	37.8	45.7	33.2	8.71	56.7	44.6	26.0	53.0	38.3
1952	53.5	42.1	36.2	37.4	44.6	48.6	82.7	235	139	44.3	2.22	2.87	64.1
1953	19.0	24.4	39.9	43.5	45.8	75.0	71.7	109	101	19.9	40.4	2.45	49.4
1954	6.92	35.2	37.5	32.1	44.4	52.4	58.2	9.87	24.9	1.84	9.95	.000	25.9
1955	7.35	31.4	30.6	27.0	31.9	37.0	58.1	2.88	33.3	8.02	13.4	14.9	24.5
1956	24.8	33.5	35.0	37.4	36.8	60.1	43.3	19.0	9.32	18.4	23.7	2.48	28.7
1957	2.84	43.0	33.6	25.4	34.1	30.1	38.7	195	96.4	37.5	9.56	23.4	47.6
1958	27.0	32.1	35.5	32.7	28.1	33.9	41.8	11.9	56.5	56.5	6.43	2.11	30.4
1959	9.42	33.0	30.0	25.0	28.0	24.0	40.0	30.0	20.0	20.0	3.52	17.3	23.3
1960	19.4	23.5	22.3	22.1	23.5	49.7	25.7	6.64	7.76	4.17	3.49	5.70	17.8
1961	1.07	16.5	26.8	27.3	28.6	18.2	1.33	4.31	12.9	8.56	2.95	2.56	12.5
1962	5.51	21.2	15.4	11.7	19.8	29.7	9.19	134	128	205	27.5	8.19	51.7
[3]1963	29.6	32.9	26.3	25.7	30.5	69.1	53.7	45.3	111	76.5	20.4	47.3	47.3
1964	38.1	35.1	30.1	34.9	37.1	44.5	74.9	65.6	173	83.4	15.6	26.4	54.8
1965	36.2	44.9	40.8	48.2	44.0	47.4	82.5	338	500	202	61.1	72.2	127
1966	97.6	57.3	49.8	41.8	43.4	125	122	73.2	13.1	26.0	40.3	42.1	61.1
1967	51.7	47.0	38.6	40.1	40.9	55.8	96.2	152	543	221	35.0	59.6	115
1968	57.5	53.9	53.7	55.2	54.6	60.6	61.4	23.1	121	36.1	43.9	33.8	54.4
1969	24.3	38.3	30.6	29.7	41.4	75.0	53.2	52.6	33.6	61.9	17.1	11.2	39.1
1970	25.7	46.6	38.5	34.5	40.7	49.4	150	202	129	14.1	15.4	69.9	67.8
1971	49.2	46.4	34.2	33.7	55.4	73.2	230	284	192	43.2	21.6	56.8	93.2
1972	42.0	59.8	48.4	35.3	47.2	90.4	66.7	77.5	387	171	98.0	47.5	97.4
1973	69.9	64.7	50.5	50.9	49.6	71.1	102	159	68.5	33.3	21.1	43.5	65.5
1974	34.6	49.4	31.1	34.8	44.6	43.8	36.6	26.8	24.2	29.3	29.5	31.4	34.6
1975	23.3	33.1	38.4	39.6	40.3	46.0	75.6	40.7	111	39.7	13.1	14.0	42.8
1976	23.5	30.4	39.1	39.6	44.5	40.5	48.0	67.4	220	64.5	30.3	26.1	56.0
1977	34.2	45.5	44.9	35.1	50.0	54.9	212	107	47.7	25.4	24.9	25.6	58.7
1978	45.1	40.9	34.9	21.8	33.2	114	55.1	285	186	58.0	35.5	19.9	77.8
1979	46.4	49.8	44.4	31.1	43.4	83.1	65.2	17.2	48.5	64.3	45.8	14.0	46.1
1980	23.3	49.9	38.8	44.6	44.8	53.2	50.6	23.2	61.7	23.6	31.3	26.9	39.2
1981	25.8	36.0	32.0	33.5	33.8	30.9	11.5	44.0	24.6	63.8	18.5	19.6	31.2
1982	23.9	31.8	32.6	34.8	34.0	44.5	37.7	112	95.1	131	151	99.0	69.3
1983	134	74.9	68.9	58.6	61.1	75.8	122	243	74.7	48.7	39.8	31.7	86.4
1984	42.2	49.3	42.1	72.5	80.8	55.7	112	190	183	65.7	34.1	32.5	79.8
1985	45.1	61.1	68.8	64.1	47.7	97.9	75.8	23.6	28.2	27.3	31.0	28.8	50.0
1986	35.8	42.0	42.4	49.7	128	117	129	73.0	73.5	43.9	23.4	69.4	68.4
1987	99.1	100	65.4	58.7	55.0	92.9	105	91.6	57.2	22.3	44.1	30.8	68.6
1988	23.9	32.6	31.0	17.7	15.0	134	26.8	30.7	14.1	17.3	23.2	17.5	32.1
1989	25.3	36.5	27.2	22.7	29.5	36.0	26.7	18.0	14.8	15.5	16.5	29.1	24.8
1990	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
1991	21.9	29.1	32.8	29.5	33.6	32.5	36.4	94.2	111	18.3	17.6	37.8	41.2
1992	34.0	44.0	48.2	47.8	47.5	52.7	43.2	27.9	31.2	46.5	17.8	15.0	38.0
1993	17.3	38.0	38.7	28.2	36.4	64.9	68.6	129	242	165	79.1	78.4	82.2

[1]Indicates a no-value month.
[2]Incomplete water year.
[3]Pactola Reservoir filled during water year 1963.
[4]Record collected during WY 1990 at station 06422000, Rapid Creek at Creston.

Table E26.2. Statistics on mean flow, in cubic feet per second, for station 06421500, Rapid Creek near Farmingdale (October 1963 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	29	29	29	29	29	29	29	29	29	29	29	29	29
Maximum	134	100	68.9	72.5	128	134	230	338	543	221	151	99.0	127
Percentile													
75th	47.8	51.9	48.3	48.9	49.8	86.7	108	155	184	65.1	42.1	52.2	78.8
50th	35.8	45.5	38.8	35.3	44.0	55.8	68.6	73.2	74.7	43.9	30.3	31.4	58.7
25th	24.1	36.2	32.7	32.3	36.7	45.2	45.6	29.3	32.4	25.7	18.1	22.7	40.2
Minimum	17.3	29.1	27.2	17.7	15.0	30.9	11.5	17.2	13.1	14.1	13.1	11.2	24.8
Mean	43.13	47.18	41.96	40.30	46.81	67.68	81.96	105.91	131.33	64.21	37.09	38.29	62.16
Standard deviation	26.78	14.97	11.24	12.99	19.43	28.57	51.58	90.57	138.01	57.29	29.19	22.25	25.33
Skewness	2.04	1.76	1.15	0.62	2.77	0.89	1.37	1.18	1.84	1.66	2.63	1.09	0.79
Coefficient of variation	0.62	0.32	0.27	0.32	0.42	0.42	0.63	0.86	1.05	0.89	0.79	0.58	0.41
Percent of annual flow	5.78	6.33	5.63	5.40	6.28	9.07	10.99	14.20	17.61	8.61	4.97	5.13	[1]0.206

[1]Serial correlation for annual mean flows.

Table E26.3. Serial correlation for 1-year lag for monthly mean flow for station 06421500, Rapid Creek near Farmingdale (October 1963 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.047	-0.073	-0.104	0.371	0.166	0.205	0.148	0.017	-0.102	-0.107	-0.121	-0.077

Table E26.4. Correlation matrix for monthly mean flow for station 06421500, Rapid Creek near Farmingdale (October 1963 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.806	0.735	0.500	0.241	0.390	0.354	0.269	-0.075	-0.118	0.013	-0.060
Nov.	*	1.000	0.819	0.606	0.276	0.345	0.323	0.128	-0.068	-0.122	0.064	-0.046
Dec.	*	*	1.000	0.739	0.336	0.351	0.283	0.047	-0.085	-0.113	0.085	-0.065
Jan.	*	*	*	1.000	0.598	0.017	0.259	0.107	0.028	-0.046	-0.003	0.036
Feb.	*	*	*	*	1.000	0.222	0.441	0.111	-0.010	-0.076	-0.082	0.208
Mar.	*	*	*	*	*	1.000	0.183	0.032	-0.156	-0.145	0.037	-0.068
Apr.	*	*	*	*	*	*	1.000	0.498	0.109	-0.095	-0.149	0.260
May	*	*	*	*	*	*	*	1.000	0.532	0.346	0.129	0.441
June	*	*	*	*	*	*	*	*	1.000	0.863	0.311	0.454
July	*	*	*	*	*	*	*	*	*	1.000	0.581	0.523
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.620
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E26.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06421500, Rapid Creek near Farmingdale

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1964	0.60	3	1.10	3	1.29	3	2.06	1	9.87	4	17.4	10	23.4	8	28.2	12	33.2	12
1965	4.00	16	4.33	12	7.43	13	23.9	25	33.9	26	36.9	24	40.3	23	45.0	23	58.4	25
1966	1.30	6	1.67	5	4.03	6	8.31	8	10.3	6	13.6	3	20.7	7	27.0	9	34.9	14
1967	6.00	20	21.7	27	24.9	27	25.9	26	30.0	25	46.5	25	49.9	26	50.9	26	52.1	23
1968	5.80	19	7.53	19	12.7	22	13.5	16	19.9	19	25.2	19	31.1	17	30.2	14	32.8	11
1969	.0000	1	.0000	1	.0000	1	2.54	2	4.27	1	9.71	1	16.8	4	24.3	6	28.2	7
1970	.0000	2	.0000	2	.90	2	3.39	4	11.8	9	14.4	5	30.9	16	36.5	18	38.0	19
1971	1.60	10	6.17	14	6.67	10	9.01	10	14.6	11	24.0	14	33.8	21	36.8	19	42.0	21
1972	3.20	15	16.7	26	23.7	26	34.7	27	43.0	27	47.2	26	48.9	25	49.8	25	54.3	24
1973	2.20	11	3.10	9	8.26	14	9.93	12	19.2	17	27.0	20	31.3	18	32.4	17	35.4	16
1974	3.00	14	5.27	13	7.19	12	9.41	11	17.3	14	21.9	12	26.0	14	27.0	10	27.0	6
1975	1.50	8	1.77	7	1.93	4	2.76	3	8.16	2	12.2	2	15.5	1	19.0	2	24.6	3
1976	6.20	23	8.23	21	9.50	17	11.2	15	21.2	21	25.1	18	29.1	15	32.0	16	35.8	17
1977	7.80	25	9.13	23	12.6	21	14.4	18	17.4	15	22.7	13	23.4	9	29.6	13	32.2	10
1978	10.0	27	11.0	24	13.1	23	17.4	21	19.8	18	25.0	17	33.2	19	37.3	20	37.2	18
1979	6.10	21	7.43	18	8.83	16	10.6	13	13.7	10	17.6	11	25.9	13	30.7	15	35.0	15
1980	7.20	24	8.13	20	8.27	15	10.8	14	17.4	16	24.4	16	25.5	12	26.6	8	28.9	8
1981	.80	4	1.73	6	2.17	5	3.99	5	9.95	5	16.9	8	20.2	6	23.1	5	26.7	5
1982	9.90	26	12.0	25	16.6	24	21.3	23	28.4	23	59.2	27	60.2	27	64.3	27	78.2	27
1983	1.40	7	6.47	15	18.4	25	23.8	24	29.4	24	35.2	23	37.3	22	38.4	22	41.4	20
1984	4.40	17	8.30	22	11.4	20	17.7	22	19.9	20	28.2	21	33.4	20	38.0	21	47.6	22
1985	2.30	12	3.93	11	6.94	11	13.5	17	16.8	13	24.1	15	24.8	11	27.0	11	28.9	9
1986	6.10	22	7.27	17	10.2	19	14.4	19	23.7	22	31.1	22	41.3	24	49.7	24	63.2	26
1987	1.50	9	2.00	8	4.29	8	7.43	7	8.93	3	13.6	4	16.4	2	20.6	4	22.8	2
1988	2.80	13	3.33	10	6.11	9	8.50	9	10.7	7	15.7	7	17.5	5	17.2	1	20.3	1
1989	(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)	
1990	(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)		(2)	
1991	5.00	18	6.77	16	9.99	18	14.5	20	16.1	12	17.1	9	24.1	10	26.5	7	33.2	13
1992	.85	5	1.30	4	4.06	7	7.41	6	11.4	8	15.4	6	16.5	3	20.5	3	25.7	4

[1]Low-flow water year is Apr. 1 to Mar. 31.
[2]Low-flow statistics not computed for water year 1989-90.

Table E26.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06421500, Rapid Creek near Farmingdale

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1964	281	22	260	20	250	15	242	14	216	11	130	16	118	15	102	13	80.8	15
1965	858	4	646	5	605	3	590	3	539	2	460	1	354	1	285	1	209	1
1966	300	21	281	18	247	16	199	15	166	16	143	14	111	16	93.2	16	78.8	17
1967	1,210	2	981	2	870	2	692	1	608	1	386	2	310	2	255	2	185	2
1968	337	20	299	16	194	20	153	20	131	19	79.9	22	69.2	21	66.5	21	63.9	19
1969	381	18	235	22	154	23	108	23	79.6	24	78.3	23	66.8	22	58.5	22	53.7	23
1970	502	11	485	7	380	9	289	10	265	7	201	7	162	8	134	8	101	10
1971	484	13	461	8	423	7	389	5	340	5	286	4	237	3	200	3	148	4
1972	2,860	1	1,788	1	949	1	626	2	429	3	295	3	224	4	187	4	149	3
1973	226	25	204	24	202	19	199	16	186	14	138	15	119	14	102	14	84.4	12
1974	118	28	90.0	28	73.6	28	54.3	28	50.5	28	47.6	27	46.1	27	40.3	27	41.1	27
1975	435	16	257	21	175	22	169	19	123	20	81.6	21	77.1	19	70.7	19	60.4	20
1976	924	3	667	4	482	5	384	6	248	9	165	10	122	13	101	15	81.2	14
1977	441	15	386	13	337	10	297	8	223	10	160	11	125	12	107	12	84.4	13
1978	430	17	414	10	404	8	390	4	345	4	241	5	183	5	163	5	123	6
1979	241	24	152	26	117	26	102	24	89.4	23	74.9	24	64.3	24	56.0	23	54.7	22
1980	533	9	324	15	175	21	100	25	61.7	26	52.2	25	49.6	26	48.5	26	47.0	25
1981	363	19	220	23	141	24	94.7	26	65.8	25	46.0	28	45.7	28	38.6	28	35.0	28
1982	534	8	338	14	273	14	195	17	171	15	143	13	134	10	131	10	105	9
1983	760	6	456	9	318	12	283	11	253	8	184	9	150	9	132	9	107	8
1984	503	10	390	12	318	11	267	13	206	12	194	8	163	7	143	7	119	7
1985	180	26	153	25	138	25	125	22	113	21	91.5	19	76.6	20	73.9	18	69.8	18
1986	800	5	713	3	513	4	309	7	194	13	148	12	133	11	118	11	95.0	11
1987	461	14	288	17	203	18	141	21	110	22	100	18	98.3	17	89.3	17	80.7	16
1988	579	7	549	6	466	6	271	12	152	17	90.1	20	66.8	23	53.9	24	44.4	26
1989	134	27	77.0	29	53.6	29	44.3	29	39.8	29	34.3	29	31.3	29	29.3	29	30.0	29
1990	(1)		(1)		(1)		(1)		(1)		(1)		(1)		(1)		(1)	
1991	265	23	261	19	228	17	179	18	143	18	106	17	82.2	18	69.1	20	56.2	21
1992	115	29	107	27	74.6	27	63.1	27	55.0	27	51.5	26	50.0	25	49.5	25	47.4	24
1993	494	12	399	11	302	13	294	9	271	6	206	6	180	6	156	6	127	5

[1]High-flow statistics not computed for water year 1990.

Table E27.1. Mean flow, in cubic feet per second, for station 06422500, Boxelder Creek near Nemo

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1945	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	20.9	13.2	8.17	(2)
1946	6.03	4.92	3.08	3.14	2.91	11.5	12.1	138	140	51.2	18.3	19.3	34.4
1947	19.4	13.9	10.0	6.48	9.93	20.2	46.2	35.7	77.6	61.6	(1)	(1)	(2)
1966	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	9.65	6.76	8.11	5.17	(2)
1967	6.62	5.14	3.54	3.38	5.00	15.0	17.2	39.0	157	48.1	19.2	13.5	27.7
1968	11.1	9.77	5.90	6.89	7.40	9.42	10.1	9.74	14.8	8.24	5.60	5.49	8.70
1969	3.97	4.49	2.74	1.78	2.40	5.17	18.3	23.7	13.3	16.1	6.38	3.70	8.55
1970	5.30	5.70	3.41	2.65	3.37	5.26	30.9	77.3	77.9	23.3	19.3	9.61	22.1
1971	7.73	9.04	6.39	3.51	10.0	11.0	84.4	93.7	64.7	23.3	10.5	10.9	27.9
1972	10.7	9.75	5.31	3.78	3.05	11.8	11.4	22.5	489	57.5	29.2	14.0	55.1
1973	12.7	9.47	7.11	7.95	7.71	9.00	40.1	57.0	29.1	15.6	10.2	8.33	17.9
1974	7.71	7.77	6.30	5.87	5.99	8.30	9.31	6.20	4.09	3.84	3.48	2.96	5.98
1975	3.14	3.88	2.71	2.45	2.14	5.31	32.1	50.2	39.1	24.5	11.1	4.94	15.2
1976	5.49	5.49	6.12	5.49	9.05	9.59	14.2	20.6	114	36.3	14.0	9.26	20.7
1977	7.43	6.34	6.42	5.73	6.02	10.9	86.7	49.1	20.4	10.2	7.89	7.34	18.7
1978	8.86	5.96	4.75	4.03	3.71	14.5	16.2	126	33.4	19.9	15.7	9.41	22.0
1979	8.19	7.89	6.39	4.19	6.02	12.4	13.3	8.63	7.32	10.3	7.05	4.09	7.99
1980	3.80	3.92	3.46	2.28	3.44	7.50	12.8	10.7	7.47	3.45	3.10	2.92	5.40
1981	3.15	3.22	4.70	4.21	3.39	2.66	3.03	7.08	6.45	5.75	3.05	2.86	4.14
1982	3.06	2.79	2.02	1.42	2.12	5.97	6.79	43.6	27.4	14.2	11.1	8.57	10.8
1983	26.8	22.3	10.5	8.50	9.47	17.6	50.4	76.5	36.1	19.0	9.88	6.55	24.5
1984	7.90	7.10	5.27	6.52	7.66	9.86	20.5	71.0	72.1	35.5	23.2	11.7	23.2
1985	8.70	7.74	7.79	5.17	3.72	15.0	11.3	7.31	5.22	2.67	2.11	2.31	6.61
1986	3.39	2.59	2.25	3.45	6.36	11.2	25.6	33.9	24.3	14.8	8.16	11.1	12.3
1987	11.9	8.40	5.73	3.34	7.23	15.0	29.1	16.9	12.2	5.78	3.28	3.93	10.2
1988	4.46	4.59	3.40	1.72	2.03	7.29	11.6	11.7	3.92	1.70	1.65	1.17	4.61
1989	1.85	1.66	1.65	1.60	1.36	7.64	6.46	12.0	6.41	2.58	.76	1.51	3.81
1990	1.88	2.56	2.57	3.14	3.79	10.1	13.5	15.3	7.60	3.25	2.11	1.52	5.62
1991	2.07	2.33	1.65	1.64	1.44	4.45	10.6	39.4	64.3	16.4	8.80	8.91	13.5
1992	7.25	8.05	7.39	6.64	5.80	8.58	8.28	6.58	8.91	7.69	3.79	3.62	6.88
1993	3.02	3.88	2.64	3.05	3.82	11.9	18.7	64.2	90.0	49.7	22.1	13.4	24.0

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E27.2. Statistics on mean flow, in cubic feet per second, for station 06422500, Boxelder Creek near Nemo (October 1966 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	27	27	27	27	27	27	27	27	27	27	27	27	27
Maximum	26.8	22.3	10.5	8.50	10.0	17.6	86.7	126	489	57.5	29.2	14.0	55.1
Percentile													
75th	8.70	8.05	6.39	5.73	7.23	11.9	29.1	57.0	64.7	23.3	14.0	9.61	22.1
50th	6.62	5.70	4.75	3.51	3.82	9.59	14.2	23.7	24.3	14.8	8.16	6.55	12.3
25th	3.15	3.88	2.71	2.45	3.05	7.29	10.6	10.7	7.47	5.75	3.28	2.96	6.61
Minimum	1.85	1.66	1.65	1.42	1.36	2.66	3.03	6.20	3.92	1.70	0.76	1.17	3.81
Mean	6.97	6.36	4.74	4.09	4.94	9.72	22.70	37.03	53.20	17.76	9.73	6.80	15.34
Standard deviation	5.08	4.04	2.21	2.02	2.54	3.73	21.13	31.43	95.17	15.49	7.50	4.04	11.19
Skewness	2.37	2.38	0.51	0.60	0.42	0.18	2.17	1.14	4.00	1.23	1.00	0.28	1.78
Coefficient of variation	0.73	0.64	0.47	0.49	0.51	0.38	0.93	0.85	1.79	0.87	0.77	0.59	0.73
Percent of annual flow	3.79	3.46	2.58	2.22	2.69	5.28	12.33	20.12	28.91	9.65	5.29	3.69	[1]0.337

[1]Serial correlation for annual mean flows.

Table E27.3. Serial correlation for 1-year lag for monthly mean flow for station 06422500, Boxelder Creek near Nemo (October 1966 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.022	-0.010	-0.173	0.025	-0.143	0.170	-0.080	0.035	0.012	0.049	0.027	0.074

Table E27.4. Correlation matrix for monthly mean flow for station 06422500, Boxelder Creek near Nemo (October 1966 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.975	0.832	0.729	0.624	0.646	0.348	0.259	0.120	0.076	0.118	0.097
Nov.	*	1.000	0.861	0.730	0.644	0.585	0.375	0.231	0.140	0.096	0.123	0.082
Dec.	*	*	1.000	0.857	0.722	0.546	0.361	0.067	0.000	-0.061	-0.045	-0.061
Jan.	*	*	*	1.000	0.743	0.420	0.256	0.094	-0.037	0.015	0.055	0.069
Feb.	*	*	*	*	1.000	0.508	0.515	0.220	-0.052	0.111	0.085	0.247
Mar.	*	*	*	*	*	1.000	0.266	0.249	0.173	0.236	0.198	0.259
Apr.	*	*	*	*	*	*	1.000	0.522	-0.044	0.075	0.097	0.260
May	*	*	*	*	*	*	*	1.000	0.085	0.404	0.551	0.596
June	*	*	*	*	*	*	*	*	1.000	0.785	0.754	0.630
July	*	*	*	*	*	*	*	*	*	1.000	0.935	0.867
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.892
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E27.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06422500, Boxelder Creek near Nemo

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1967	4.00	21	4.00	21	4.43	21	4.96	21	5.18	20	5.94	23	6.57	24	7.22	24	8.42	24
1968	.70	3	.80	3	.91	4	1.06	3	1.49	5	1.97	6	2.22	5	2.71	7	3.30	8
1969	1.60	11	1.70	12	1.79	12	1.83	10	2.33	11	2.65	10	2.97	11	3.61	12	3.98	12
1970	1.00	5	1.00	5	1.29	7	1.86	11	2.98	14	3.93	16	5.69	19	6.26	20	7.39	22
1971	1.50	10	1.57	10	1.74	10	1.76	9	2.29	10	3.35	13	4.00	13	5.35	14	7.07	20
1972	5.00	25	5.17	26	5.57	26	6.00	26	6.99	26	7.48	25	7.56	25	7.73	25	9.03	25
1973	4.50	23	4.83	24	5.07	24	5.32	25	5.84	24	5.89	22	6.03	21	6.41	21	6.92	17
1974	1.30	8	1.40	8	1.41	8	1.53	7	1.91	7	2.26	8	2.43	8	2.64	6	2.83	6
1975	3.00	18	3.50	19	3.93	19	4.29	19	4.86	19	5.13	19	5.29	17	5.43	15	6.02	14
1976	5.00	26	5.00	25	5.07	25	5.25	23	5.67	23	5.86	21	5.94	20	6.03	17	6.75	15
1977	2.40	16	2.57	16	2.91	17	3.27	17	3.40	16	3.79	15	4.12	14	4.51	13	5.72	13
1978	3.00	19	3.33	18	3.46	18	3.58	18	4.13	18	4.83	18	5.52	18	6.11	19	6.95	18
1979	1.80	13	1.93	13	2.09	13	2.11	12	2.26	9	2.48	9	2.93	10	3.17	11	3.50	11
1980	1.60	12	1.60	11	1.77	11	2.33	14	2.36	12	2.94	12	2.80	9	2.99	9	3.39	10
1981	1.00	6	1.10	6	1.20	6	1.32	6	1.33	3	1.49	3	1.74	4	2.08	4	2.30	4
1982	4.00	22	4.17	22	4.66	22	5.26	24	6.32	25	8.67	26	9.07	26	11.4	26	14.4	26
1983	3.50	20	3.77	20	4.07	20	4.64	20	5.26	21	5.75	20	6.26	22	6.55	22	6.80	16
1984	2.20	15	2.37	15	2.57	15	2.91	15	3.74	17	4.30	17	5.16	15	5.84	16	6.99	19
1985	1.40	9	1.40	9	1.46	9	1.64	8	1.93	8	2.11	7	2.31	7	2.56	5	2.52	5
1986	2.50	17	2.67	17	2.71	16	3.11	16	3.29	15	3.78	14	5.22	16	6.06	18	7.86	23
1987	.60	2	.73	2	.89	2	1.26	5	1.62	6	1.70	5	2.28	6	2.73	8	3.33	9
1988	.84	4	.86	4	.90	3	.93	2	1.03	2	1.21	2	1.43	2	1.51	1	1.51	1
1989	.10	1	.11	1	.14	1	.28	1	.76	1	.97	1	1.29	1	1.53	2	1.97	3
1990	1.10	7	1.10	7	1.10	5	1.21	4	1.41	4	1.52	4	1.58	3	1.75	3	1.77	2
1991	4.70	24	4.70	23	4.80	23	5.16	22	5.45	22	6.11	24	6.56	23	6.90	23	7.30	21
1992	2.00	14	2.20	14	2.23	14	2.31	13	2.52	13	2.79	11	3.07	12	3.09	10	3.29	7

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E27.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06422500, Boxelder Creek near Nemo

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1967	556	3	499	3	368	2	265	2	167	2	103	2	82.8	2	66.9	3	49.5	2
1968	36.0	20	25.3	19	19.1	20	15.9	21	14.9	20	12.3	22	11.6	19	11.0	19	10.0	18
1969	85.0	15	57.3	16	41.9	17	33.3	17	25.4	17	21.3	17	18.6	17	18.0	17	13.9	17
1970	375	4	263	4	175	5	113	8	81.5	9	80.7	5	64.0	5	53.6	5	39.7	5
1971	182	8	159	7	153	6	142	5	117	5	100	3	82.8	3	67.5	2	48.3	3
1972	6,700	1	3,533	1	1,646	1	897	1	507	1	275	1	192	1	150	1	103	1
1973	98.0	13	83.3	13	77.3	13	72.7	13	67.5	12	53.7	11	43.0	11	35.9	12	27.0	12
1974	18.0	27	17.3	25	14.4	26	11.6	25	9.50	25	8.82	25	8.09	26	7.58	26	7.28	24
1975	92.0	14	75.3	14	70.3	14	62.1	14	54.0	14	45.2	13	42.3	12	37.2	11	27.2	11
1976	829	2	501	2	328	3	199	3	119	4	76.1	7	57.3	8	47.0	8	34.7	9
1977	140	10	137	9	130	8	124	6	103	6	68.9	9	52.5	10	42.6	10	30.8	10
1978	261	5	243	5	200	4	165	4	128	3	83.3	4	62.2	6	50.7	7	38.2	7
1979	39.0	19	24.0	20	18.1	22	15.3	22	13.7	22	13.1	20	11.6	20	10.8	20	9.88	19
1980	25.0	22	23.0	22	20.3	19	16.3	20	14.6	21	12.1	23	10.6	22	9.69	22	7.59	23
1981	23.0	26	15.7	27	12.7	27	10.7	27	8.80	27	7.15	27	6.59	27	5.73	27	4.77	27
1982	165	9	129	10	107	12	77.8	12	55.9	13	38.0	14	29.6	14	24.8	15	18.7	15
1983	134	12	119	12	110	10	95.8	10	88.2	8	68.8	10	55.5	9	46.8	9	35.1	8
1984	138	11	120	11	107	11	95.7	11	72.8	11	72.5	8	60.1	7	51.3	6	39.2	6
1985	68.0	16	50.0	18	36.3	18	24.6	18	18.4	18	13.7	19	11.6	21	9.92	21	8.53	21
1986	68.0	17	55.7	17	48.1	16	43.7	15	41.2	15	33.6	15	28.7	15	24.9	14	19.9	14
1987	67.0	18	61.0	15	48.7	15	38.7	16	30.1	16	23.5	16	20.9	16	18.5	16	14.3	16
1988	29.0	21	23.7	21	18.3	21	14.9	23	13.0	23	12.5	21	10.6	23	8.82	23	6.45	25
1989	24.0	23	21.7	23	16.8	24	14.5	24	12.2	24	9.63	24	9.28	24	8.32	24	6.12	26
1990	24.0	24	19.7	24	17.7	23	16.9	19	15.9	19	14.4	18	13.3	18	11.8	18	8.94	20
1991	199	6	158	8	129	9	101	9	80.9	10	53.7	12	40.5	13	33.1	13	24.7	13
1992	24.0	25	16.7	26	14.6	25	11.5	26	8.96	26	8.44	26	8.27	25	8.18	25	7.64	22
1993	188	7	171	6	143	7	121	7	95.2	7	79.9	6	68.9	4	57.4	4	43.6	4

Table E28.1. Mean flow, in cubic feet per second, for station 06423010, Boxelder Creek near Rapid City

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1978	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	5.44	1.85	0.57	0.043	(2)
1979	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.000	.000	.000	.000	.000
1980	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1981	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1982	.000	.000	.000	.000	.000	.000	.000	1.13	.000	.000	.000	.000	.096
1983	.000	.000	.000	.000	.000	.000	4.67	34.7	4.10	1.13	.000	.000	3.76
1984	.000	.000	.000	.000	.000	.000	.000	15.8	21.7	7.06	3.82	.33	4.06
1985	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1986	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1987	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1988	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1989	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1990	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1991	.000	.000	.000	.000	.000	.000	.000	.000	27.9	.000	.000	.000	2.29
1992	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1993	.000	.000	.000	.000	.000	.000	.000	1.82	40.3	.36	.000	.000	3.50

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E28.2. Statistics on mean flow, in cubic feet per second, for station 06423010, Boxelder Creek near Rapid City (October 1978 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	15	15	15	15	15	15	15	15	15	15	15	15	15
Maximum	0.000	0.000	0.000	0.000	0.000	0.000	4.67	34.7	40.3	7.06	3.82	0.33	4.06
Percentile													
75th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.13	4.10	0.000	0.000	0.000	2.29
50th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.31	3.56	6.27	0.57	0.25	0.02	0.91
Standard deviation	0.00	0.00	0.00	0.00	0.00	0.00	1.21	9.52	12.82	1.82	0.99	0.09	1.59
Skewness	(1)	(1)	(1)	(1)	(1)	(1)	3.87	3.01	1.98	3.71	3.87	3.87	1.34
Coefficient of variation	(1)	(1)	(1)	(1)	(1)	(1)	3.87	2.67	2.05	3.19	3.87	3.87	1.75
Percent of annual flow	0.00	0.00	0.00	0.00	0.00	0.00	2.83	32.43	57.03	5.19	2.32	0.20	[2]0.179

[1]Statistic not computed.
[2]Serial correlation for annual mean flows.

Table E28.3. Serial correlation for 1-year lag for monthly mean flow for station 06423010, Boxelder Creek near Rapid City (October 1978 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
(1)	(1)	(1)	(1)	(1)	(1)	-0.077	0.310	-0.175	0.064	-0.077	-0.077

[1]Statistic not computed.

Table E28.4. Correlation matrix for monthly mean flow for station 06423010, Boxelder Creek near Rapid City (October 1978 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mar.	*	*	*	*	*	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Apr.	*	*	*	*	*	*	1.000	0.905	-0.047	0.085	-0.071	-0.071
May	*	*	*	*	*	*	*	1.000	.131	.499	.356	.356
June	*	*	*	*	*	*	*	*	1.000	.364	.333	.333
July	*	*	*	*	*	*	*	*	*	1.000	.986	.986
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	(1)
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

[1]Statistic not computed.

Table E28.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06423010, Boxelder Creek near Rapid City

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1979	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
1980	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2
1981	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3
1982	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4
1983	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5
1984	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6
1985	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7
1986	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8
1987	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9
1988	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10
1989	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11
1990	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12
1991	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13
1992	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E28.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06423010, Boxelder Creek near Rapid City

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1979	0.0000	6	0.0000	6	0.0000	6	0.0000	6	0.0000	6	0.0000	6	0.0000	6	0.0000	6	0.0000	6
1980	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7
1981	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8
1982	15.0	5	11.2	5	5.02	5	2.34	5	1.17	5	.59	5	.39	5	.29	5	.19	5
1983	87.0	3	75.0	3	65.6	3	52.3	3	36.9	2	21.9	1	15.2	2	11.4	2	7.50	2
1984	60.0	4	57.0	4	51.1	4	38.5	4	23.0	4	19.8	3	15.7	1	12.3	1	8.13	1
1985	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9
1986	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10
1987	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11
1988	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12
1989	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13
1990	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14
1991	114	1	108	1	84.6	1	54.1	2	27.9	3	13.9	4	9.29	4	6.97	4	4.57	4
1992	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15
1993	102	2	87.3	2	72.0	2	69.3	1	40.7	1	21.3	2	14.2	3	10.6	3	6.98	3

Table E29.1. Mean flow, in cubic feet per second, for station 06423500, Cheyenne River near Wasta

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1914	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	632	111	(2)
1915	238	156	102	(1)	101	850	1,465	4,388	7,551	(1)	(1)	(1)	(2)
1928	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	161	(2)
1929	167	255	140	110	129	1,744	1,803	1,551	3,285	1060	457	531	937
1930	365	327	200	125	800	750	694	745	489	68.6	719	401	471
1931	798	180	150	165	256	240	563	159	599	102	497	66.3	315
1932	193	117	110	100	150	1,340	1,262	1,599	683	(1)	(1)	(1)	(2)
1933	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
1934	(1)	(1)	(1)	(1)	(1)	(1)	243	46.3	752	596	373	47.7	(2)
1935	346	119	56.5	54.5	303	294	1,108	1,820	4,245	348	65.5	58.7	731
1936	60.4	112	69.5	70.8	60.4	565	346	86.4	115	29.9	117	56.6	141
1937	31.2	104	94.2	61.1	38.9	244	517	99.6	1,417	1,852	78.7	116	389
1938	54.3	64.6	66.7	152	150	491	269	298	939	994	380	664	378
1939	63.2	59.1	66.5	64.2	32.9	289	160	951	589	258	212	139	242
1940	112	55.2	45.7	64.3	153	451	875	363	595	88.5	37.9	47.3	240
1941	113	49.5	49.3	41.8	78.7	159	953	368	1,700	974	479	145	426
1942	218	117	105	66.1	69.5	197	634	6,912	1,704	384	325	116	914
1943	165	141	47.2	36.3	587	907	669	233	2,428	338	61.5	30.1	466
1944	58.5	131	76.0	60.2	69.5	327	736	674	1,268	871	73.8	43.4	365
1945	83.9	197	80.2	70.6	106	672	259	149	745	442	525	105	287
1946	96.8	122	68.2	80.5	212	237	168	1,960	1,947	722	112	544	523
1947	325	199	145	144	312	331	361	249	3,878	1,291	224	74.7	625
1948	118	146	177	95.2	227	811	282	201	926	603	383	44.2	335
1949	94.5	146	77.6	49.8	119	2,240	652	528	570	154	142	62.3	406
1950	105	76.8	31.8	21.1	55.7	348	391	613	80.7	149	193	135	184
1951	101	89.7	67.4	66.1	84.6	121	79.8	39.9	479	189	105	277	141
1952	86.2	94.6	49.4	23.1	322	739	394	1,090	567	255	150	151	327
1953	143	118	147	189	231	718	444	767	502	143	282	69.3	314
1954	50.1	65.2	71.6	72.4	142	151	103	105	119	53.7	51.3	22.4	83.5
1955	91.3	63.2	74.4	52.9	46.1	296	229	350	526	258	225	852	255
[3]1956	135	94.5	215	143	138	302	225	357	122	121	231	85.1	182
1957	65.3	227	114	66.6	265	228	378	2,217	1,283	332	139	108	453
1958	154	145	149	184	190	258	385	151	497	636	341	100	266
1959	138	139	105	124	137	177	155	283	122	107	67.9	146	142
1960	107	94.6	120	60.5	92.9	355	115	71.8	99.1	34.7	78.4	34.2	106
1961	44.8	57.7	71.9	82.4	72.9	125	54.8	92.3	129	85.3	71.0	33.4	76.8
1962	50.9	90.4	31.2	36.4	87.5	181	73.5	1,463	4,002	1,739	264	93.5	677
1963	183	108	88.9	54.5	133	328	284	437	2,180	350	85.4	165	365
1964	106	109	77.2	65.0	110	139	257	248	1,736	286	115	74.8	275
1965	97.6	148	90.0	116	109	160	363	2,363	2,428	810	272	208	599
1966	251	141	150	76.9	82.5	945	629	180	70.5	212	330	190	273
1967	181	149	125	122	134	413	452	839	5,270	869	140	172	735
1968	158	129	104	87.7	161	243	277	116	1,302	184	179	108	252
1969	85.9	101	59.5	50.3	70.0	181	187	165	113	1,528	83.7	79.1	228
1970	128	121	96.6	55.7	149	122	1,595	468	395	74.9	56.6	168	284
1971	127	124	71.0	52.1	151	696	878	2,428	1,907	139	108	227	577

Table E29.1. Mean flow, in cubic feet per second, for station 06423500, Cheyenne River near Wasta—Continued

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1972	188	187	109	63.2	81.4	207	194	410	1,468	406	322	123	312
1973	140	148	127	93.2	175	504	447	641	191	194	108	147	244
1974	159	174	130	448	669	334	335	90.2	71.3	94.0	96.6	108	223
1975	92.2	129	92.8	66.1	78.9	290	552	184	499	96.6	40.0	49.0	180
1976	80.3	93.2	106	46.3	129	123	313	283	899	202	116	65.8	204
1977	94.6	116	91.6	61.9	80.5	225	1,103	232	158	196	199	139	224
1978	203	112	89.6	76.4	79.5	1,199	239	2,527	386	372	313	94.9	481
1979	116	112	91.8	30.0	44.9	607	313	136	468	425	363	78.0	233
1980	127	128	133	40.5	94.8	292	244	97.6	174	49.3	133	85.1	133
1981	149	98.7	86.3	135	149	90.8	68.4	170	96.5	355	105	68.0	131
1982	102	97.7	51.5	21.4	62.8	278	128	1,660	571	724	309	261	359
1983	639	125	139	165	210	262	301	1,038	348	149	111	86.5	299
1984	119	136	70.0	83.7	219	216	738	1,465	850	259	134	107	366
1985	136	151	117	126	102	324	166	70.2	74.9	74.8	114	117	131
1986	120	100	67.7	235	352	618	1,044	493	1,338	253	91.0	305	416
1987	351	232	176	128	184	1,158	618	936	293	105	111	99.8	368
1988	96.5	113	74.6	59.8	84.5	322	157	316	99.5	88.2	96.5	67.8	132
1989	83.6	81.4	51.0	48.9	53.0	185	104	65.8	36.9	34.9	25.4	202	81.0
1990	90.7	93.1	77.4	102	155	190	72.1	309	181	125	89.3	60.2	129
1991	58.6	88.3	38.4	5.04	25.1	116	203	1,746	2,998	139	144	125	473
1992	99.0	220	142	107	159	214	98.3	132	263	230	73.5	79.2	151
1993	67.4	94.9	83.7	80.0	85.9	424	480	1,273	1,025	676	343	293	412

[1]Indicates a no-value month or year.
[2]Incomplete water year.
[3]Pactola Reservoir closed during 1956.

Table E29.2. Statistics on mean flow, in cubic feet per second, for station 06423500, Cheyenne River near Wasta (October 1956 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	37	37	37	37	37	37	37	37	37	37	37	37	37
Maximum	639	232	176	448	669	1,199	1,595	2,527	5,270	1,739	363	305	735
Percentile													
75th	156	146	122	119	160	384	466	1,155	1,320	389	231	166	390
50th	119	121	91.8	76.4	110	258	284	309	395	202	114	108	266
25th	91.4	98.2	73.2	53.3	80.9	181	156	143	125	101	87.3	78.6	146
Minimum	44.8	57.7	31.2	5.04	25.1	90.8	54.8	65.8	36.9	34.7	25.4	33.4	76.8
Mean	140.25	127.41	97.26	93.42	141.06	344.05	378.41	697.21	919.53	341.48	155.90	126.17	297.05
Standard deviation	102.54	39.73	33.01	75.79	110.29	270.96	333.54	765.59	1184.33	383.46	99.67	67.98	167.03
Skewness	3.57	1.16	0.19	3.13	3.36	2.01	1.92	1.27	2.11	2.35	0.96	1.09	0.92
Coefficient of variation	0.73	0.31	0.34	0.81	0.78	0.79	0.88	1.10	1.29	1.12	0.64	0.54	0.56
Percent of annual flow	3.94	3.58	2.73	2.62	3.96	9.66	10.62	19.57	25.81	9.59	4.38	3.54	[1] -0.031

[1]Serial correlation for annual mean flows.

Table E29.3. Serial correlation for 1-year lag for monthly mean flow for station 06423500, Cheyenne River near Wasta (October 1956 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.055	0.075	-0.080	0.003	0.015	0.154	0.162	-0.227	0.062	-0.116	0.099	-0.076

Table E29.4. Correlation matrix for monthly mean flow for station 06423500, Cheyenne River near Wasta (October 1956 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.279	0.543	0.278	0.188	0.358	0.074	0.031	-0.115	-0.175	0.025	-0.047
Nov.	*	1.000	0.691	0.307	0.382	0.256	0.116	0.109	-0.027	-0.121	0.030	-0.052
Dec.	*	*	1.000	0.386	0.309	0.358	0.098	-0.271	-0.277	-0.340	0.032	-0.198
Jan.	*	*	*	1.000	0.897	0.088	0.076	-0.187	-0.148	-0.143	-0.135	0.063
Feb.	*	*	*	*	1.000	0.049	0.202	-0.046	-0.092	-0.175	-0.229	0.073
Mar.	*	*	*	*	*	1.000	0.224	0.273	-0.098	-0.110	0.302	0.209
Apr.	*	*	*	*	*	*	1.000	0.116	0.011	-0.180	-0.045	0.424
May	*	*	*	*	*	*	*	1.000	0.429	0.266	0.317	0.358
June	*	*	*	*	*	*	*	*	1.000	0.501	0.166	0.246
July	*	*	*	*	*	*	*	*	*	1.000	0.416	0.129
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.266
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E29.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06423500, Cheyenne River near Wasta

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1957	65.0	35	68.7	35	79.7	35	86.2	35	103	36	106	30	126	33	133	33	144	32
1958	60.0	33	63.3	33	74.3	34	82.1	34	94.3	35	107	32	117	31	120	29	123	26
1959	30.0	17	35.0	21	45.0	24	50.3	23	54.5	20	66.3	15	79.8	17	87.2	16	98.4	18
1960	8.00	4	12.0	5	14.4	5	18.1	5	32.7	6	38.8	6	45.7	5	46.8	3	51.8	3
1961	1.00	1	3.27	1	9.11	3	13.9	3	23.9	4	32.4	4	41.9	3	50.0	4	48.7	2
1962	18.0	10	22.0	9	25.9	11	28.0	9	37.5	9	68.8	20	81.5	19	90.2	20	109	23
1963	25.0	14	28.3	15	34.3	18	42.9	20	61.2	22	69.2	21	82.7	21	88.4	18	97.5	17
1964	50.0	30	55.0	32	58.0	31	63.1	30	74.7	28	85.2	26	94.8	26	103	25	105	22
1965	40.0	27	41.7	26	54.3	29	59.6	27	70.0	25	77.7	23	93.1	25	108	26	149	33
1966	36.0	25	42.0	27	47.3	26	53.1	25	67.3	24	89.4	27	126	32	132	32	150	34
1967	40.0	28	43.3	28	52.9	28	63.2	31	75.0	29	92.2	28	104	27	115	27	129	28
1968	25.0	15	28.3	16	33.6	15	38.6	14	47.0	14	49.6	9	59.6	9	69.3	9	79.0	8
1969	35.0	22	38.3	23	42.0	22	43.7	21	53.4	18	65.7	14	80.1	18	88.8	19	90.7	13
1970	35.0	23	38.3	24	44.0	23	45.6	22	49.0	15	50.3	10	68.3	11	82.4	13	99.0	19
1971	30.0	18	31.3	18	33.7	17	34.3	12	41.9	11	67.9	17	82.3	20	102	24	131	29
1972	75.0	36	76.7	36	80.0	36	87.1	36	92.7	34	110	33	116	30	126	31	128	27
1973	25.0	16	25.0	14	30.0	13	42.1	17	71.3	26	115	34	129	34	138	34	142	31
1974	31.0	20	31.7	19	33.6	16	42.1	18	50.8	17	67.3	16	77.4	14	87.6	17	91.3	14
1975	21.0	11	22.3	10	24.6	9	31.3	11	34.3	7	43.5	7	48.0	6	60.5	7	69.0	6
1976	35.0	24	35.3	22	37.7	20	40.3	15	53.6	19	68.0	18	77.9	15	87.0	15	82.1	11
1977	17.0	9	23.3	12	40.3	21	61.5	28	72.4	27	77.8	24	79.4	16	86.6	14	117	24
1978	23.0	12	23.7	13	25.0	10	27.1	8	28.6	5	36.0	5	55.5	8	68.4	8	81.4	10
1979	23.0	13	23.0	11	23.4	8	24.4	6	38.4	10	60.9	11	87.7	22	98.4	23	100	21
1980	16.0	8	16.7	7	20.0	7	29.7	10	42.8	12	83.8	25	87.8	23	92.4	21	96.9	16
1981	12.0	6	13.0	6	14.7	6	17.1	4	20.7	3	25.3	2	43.5	4	56.7	6	64.1	5
1982	51.0	31	52.7	30	58.7	32	66.9	32	90.4	31	128	36	142	35	159	35	257	36
1983	32.0	21	33.7	20	37.4	19	42.5	19	55.3	21	68.1	19	91.6	24	98.1	22	99.8	20
1984	46.0	29	48.7	29	52.3	27	62.3	29	91.9	33	107	31	114	29	123	30	121	25
1985	9.60	5	10.2	4	12.9	4	25.6	7	35.0	8	62.0	12	68.2	10	81.1	11	94.9	15
1986	61.0	34	65.0	34	68.1	33	72.1	33	91.4	32	117	35	158	36	175	36	212	35
1987	30.0	19	30.0	17	32.1	14	41.8	16	49.3	16	65.0	13	71.7	12	81.3	12	87.6	12
1988	15.0	7	19.3	8	28.6	12	37.7	13	44.3	13	46.4	8	48.2	7	54.6	5	63.5	4
1989	7.10	3	7.33	3	7.99	2	12.0	2	15.7	2	28.5	3	29.6	2	35.7	2	73.5	7
1990	3.00	2	3.53	2	4.00	1	4.28	1	4.95	1	10.7	1	21.9	1	35.5	1	45.8	1
1991	51.0	32	54.0	31	56.6	30	58.4	26	75.9	30	106	29	106	28	119	28	132	30
1992	38.0	26	41.3	25	47.0	25	52.4	24	65.8	23	73.1	22	72.7	13	77.7	10	79.4	9

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E29.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06423500, Cheyenne River near Wasta

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1957	15,800	5	9,310	6	6,536	5	4,463	5	3,015	6	1,830	6	1,331	7	1,075	7	792	7
1958	3,610	25	1,832	28	1,310	25	1,110	24	778	24	627	24	501	25	462	22	388	19
1959	4,520	20	1,885	26	880	30	573	30	338	32	245	33	214	31	195	31	170	31
1960	2,000	32	1,833	27	1,171	28	659	28	381	29	242	34	191	35	165	35	141	35
1961	820	37	616	37	465	36	238	37	160	37	121	37	110	37	106	36	96.5	36
1962	16,600	4	14,830	1	10,590	2	6,506	3	4,535	2	3,433	1	2,501	1	1,902	1	1,290	2
1963	11,500	10	8,057	9	4,660	10	3,710	8	2,245	8	1,330	10	1,020	10	849	11	617	12
1964	12,100	8	6,653	10	3,975	13	2,993	12	1,845	10	1,018	15	796	16	638	16	460	16
1965	18,200	3	8,790	8	4,999	8	4,048	7	3,042	5	2,567	3	1,925	3	1,518	3	1,075	3
1966	3,890	23	2,300	24	1,914	22	1,450	22	1,095	20	826	18	597	18	467	20	398	17
1967	19,200	1	13,360	2	11,660	1	8,403	1	5,454	1	3,162	2	2,349	2	1,869	2	1,322	1
1968	4,890	18	3,910	17	2,820	18	1,795	18	1,359	17	747	19	583	19	488	19	382	22
1969	6,540	16	5,320	14	4,447	12	3,032	11	1,593	13	857	17	619	17	506	17	382	21
1970	7,290	15	6,290	11	4,726	9	3,053	10	1,819	12	1,099	13	823	14	655	15	463	15
1971	11,300	11	9,007	7	6,360	6	5,417	4	3,500	4	2,478	4	1,786	4	1,501	4	1,035	4
1972	9,240	12	6,240	12	3,613	15	2,495	15	1581	14	1,023	14	817	15	674	14	500	14
1973	3,990	22	2,421	23	1,302	26	938	26	752	26	599	25	549	21	463	21	359	23
1974	2,290	29	1,667	29	1,314	24	1,173	23	797	23	674	22	531	22	446	24	341	25
1975	2,470	28	1,960	25	1,189	27	828	27	556	27	433	27	412	27	382	27	283	27
1976	3,480	26	3,273	20	2,300	20	1,575	20	956	22	641	23	528	23	433	25	330	26
1977	4,450	21	3,790	18	3,113	16	1,874	17	1,103	19	680	21	524	24	432	26	351	24
1978	19,100	2	12,940	3	6,854	4	4,087	6	2,670	7	1,533	7	1,414	6	1,122	6	851	6
1979	5,150	17	2,564	22	1,579	23	1,026	25	769	25	556	26	428	26	449	23	387	20
1980	1,520	35	657	36	417	37	349	36	306	34	271	29	218	29	206	29	166	32
1981	1,560	34	981	33	666	32	554	31	366	30	242	35	215	30	186	32	161	34
1982	12,400	7	9,663	5	5,173	7	3,122	9	1,865	9	1,378	8	1,033	8	845	12	621	11
1983	8,470	14	4,027	16	1,931	21	1,566	21	1,063	21	706	20	573	20	496	18	391	18
1984	3,680	24	3,553	19	3,043	17	2,733	13	1,831	11	1,354	9	1,031	9	860	10	627	10
1985	900	36	747	35	625	33	458	33	335	33	251	31	202	34	182	34	165	33
1986	11,700	9	5,093	15	4,611	11	2,519	14	1,446	15	1,132	12	973	12	926	8	695	9
1987	4,650	19	2,967	21	2,652	19	1,714	19	1,321	18	910	16	934	13	768	13	556	13
1988	2,050	30	1,432	30	711	31	525	32	365	31	303	28	271	28	236	28	183	28
1989	2,630	27	1,237	31	584	34	358	34	206	36	154	36	123	36	104	37	88.1	37
1990	2,050	31	1,197	32	902	29	656	29	411	28	253	30	213	33	202	30	173	30
1991	15,000	6	12,540	4	8,866	3	6,795	2	4,115	3	2,417	5	1,682	5	1,302	5	891	5
1992	1,660	33	770	34	481	35	355	35	287	35	248	32	213	32	183	33	183	29
1993	8,640	13	5,813	13	3,813	14	2,326	16	1,401	16	1,159	11	1,005	11	874	9	706	8

Table E30.1. Mean flow, in cubic feet per second, for station 06425100, Elk Creek near Rapid City

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1979	(1)	4.39	1.15	0.97	1.31	13.4	11.6	4.89	2.73	1.43	7.14	0.13	(2)
1980	0.000	.40	1.07	1.15	1.85	1.98	1.66	.68	4.67	.054	.000	.000	1.12
1981	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.19	.000	.000	.10
1982	.000	.000	.000	.000	.000	.000	.047	90.5	5.37	3.45	.87	.000	8.49
1983	31.9	1.91	4.01	6.78	3.01	4.33	11.7	41.9	6.39	4.11	1.22	.91	9.95
1984	3.06	3.44	1.53	3.58	4.68	4.59	8.00	46.0	89.2	17.4	8.75	5.88	16.3
1985	7.47	7.46	5.72	5.15	5.53	14.7	5.92	2.57	1.43	.10	.000	.000	4.68
1986	.000	.000	.000	.000	51.8	13.8	31.4	13.7	7.33	5.28	.88	2.80	10.2
1987	4.93	5.54	3.75	2.87	5.70	11.7	10.9	27.0	6.33	.70	.000	.000	6.64
1988	.000	.94	1.28	.73	.057	9.14	5.47	2.20	.15	.000	.000	.000	1.67
1989	.000	.000	.000	.000	.000	.000	.000	2.35	.000	.000	.000	.000	.20
1990	.000	.000	.000	.000	.000	.000	.000	.088	.002	.000	.000	.000	.008
1991	.000	.000	.000	.000	.000	.000	.000	22.0	1.76	.000	.000	.000	2.01
1992	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1993	.000	.000	.000	.000	.000	11.2	1.27	31.4	7.67	2.32	.11	.000	4.56

[1]Indicates a no-value month.

[2]Incomplete water year.

Table E30.2. Statistics on mean flow, in cubic feet per second, for station 06425100, Elk Creek near Rapid City (October 1978 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	14	14	14	14	14	14	14	14	14	14	14	14	14
Maximum	31.9	7.46	5.72	6.78	51.8	14.7	31.4	90.5	89.2	17.4	8.75	5.88	4.56
Percentile													
75th	3.53	2.29	2.08	0.05	4.89	11.3	8.72	34.0	6.62	3.61	0.87	0.23	8.85
50th	0.000	0.000	0.000	0.000	0.028	3.15	1.46	8.13	3.21	0.40	0.000	0.000	3.29
25th	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.53	0.001	0.000	0.000	0.000	0.17
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mean	3.38	1.41	1.24	1.45	5.19	5.10	5.45	20.03	9.31	2.47	0.84	0.68	4.71
Standard deviation	8.53	2.40	1.89	2.25	13.60	5.76	8.59	26.09	23.19	4.65	2.31	1.68	5.00
Skewness	3.30	1.79	1.48	1.49	3.57	0.61	2.38	1.68	3.63	2.89	3.54	2.77	1.03
Coefficient of variation	2.52	1.71	1.52	1.56	2.62	1.13	1.57	1.30	2.49	1.88	2.74	2.45	1.06
Percent of annual flow	5.98	2.49	2.19	2.56	9.17	9.02	9.64	35.41	16.46	4.37	1.49	1.21	[1]0.455

[1]Serial correlation for annual mean flows.

Table E30.3. Serial correlation for 1-year lag for monthly mean flow for station 06425100, Elk Creek near Rapid City (October 1978 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.056	0.112	-0.045	0.231	0.095	0.583	0.316	0.111	-0.057	0.036	0.016	-0.048

Table E30.4. Correlation matrix for monthly mean flow for station 06425100, Elk Creek near Rapid City (October 1978 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.329	0.644	0.845	-0.044	0.122	0.249	0.235	0.030	0.139	0.100	0.078
Nov.	*	1.000	0.907	0.741	-0.016	0.597	0.197	0.018	0.253	0.163	0.218	0.161
Dec.	*	*	1.000	0.901	-0.047	0.548	0.227	0.016	0.066	0.030	0.063	0.018
Jan.	*	*	*	1.000	-0.053	0.359	0.259	0.178	0.302	0.313	0.331	0.271
Feb.	*	*	*	*	1.000	0.521	0.923	-0.051	0.047	0.234	0.070	0.423
Mar.	*	*	*	*	*	1.000	0.642	-0.063	0.037	0.085	-0.009	0.164
Apr.	*	*	*	*	*	*	1.000	0.043	0.156	0.339	0.184	0.498
May	*	*	*	*	*	*	*	1.000	0.357	0.479	0.396	0.272
June	*	*	*	*	*	*	*	*	1.000	0.953	0.989	0.911
July	*	*	*	*	*	*	*	*	*	1.000	0.972	0.956
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.929
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E30.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06425100, Elk Creek near Rapid City

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1979	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.008	10	0.17	10	.39	10	0.74	10
1980	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	1	.0000	1	.0000	1	.0000	1
1981	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	2	.0000	2	.0000	2	.0000	2
1982	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.034	11	1.39	11	1.95	11	6.84	14
1983	.26	12	.29	12	.30	12	.48	13	.79	13	1.04	12	1.52	12	1.98	12	2.06	11
1984	1.90	14	2.80	14	3.27	14	3.64	14	4.43	14	4.71	14	5.41	14	5.90	14	6.18	13
1985	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	3	.0000	3	.0000	3	.0000	3
1986	.27	13	.30	13	.33	13	.40	12	.75	12	1.75	13	2.23	13	2.93	13	3.38	12
1987	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	4	.0000	4	.11	9	.46	9
1988	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	5	.0000	5	.0000	4	.0000	4
1989	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	6	.0000	6	.0000	5	.0000	5
1990	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	7	.0000	7	.0000	6	.0000	6
1991	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	8	.0000	8	.0000	7	.0000	7
1992	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	9	.0000	9	.0000	8	.0000	8

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E30.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06425100, Elk Creek near Rapid City

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1980	38.0	11	29.3	10	16.5	10	8.31	10	4.67	10	2.70	10	2.38	10	2.34	10	1.99	10
1981	16.0	12	5.84	12	2.51	12	1.29	12	1.23	12	.62	12	.41	12	.31	12	.20	12
1982	1,060	1	532	1	325	1	183	1	95.7	1	49.6	2	34.4	3	25.8	3	16.9	3
1983	675	3	312	4	140	4	71.2	4	43.1	4	27.5	4	20.6	4	16.7	4	12.5	4
1984	515	4	360	3	226	2	158	2	93.6	2	68.7	1	52.1	1	41.5	1	29.1	1
1985	59.0	9	42.0	9	29.9	9	22.0	9	15.4	8	11.1	8	8.87	7	7.94	7	7.73	7
1986	700	2	430	2	221	3	113	3	61.4	3	43.8	3	35.7	2	28.7	2	20.0	2
1987	346	6	181	6	98.6	6	53.7	6	30.8	6	19.0	6	17.1	5	14.6	5	10.8	5
1988	76.0	8	50.3	8	30.1	8	23.5	8	14.0	9	8.27	9	5.78	9	4.34	9	3.18	9
1989	54.0	10	21.5	11	10.3	11	4.85	11	2.43	11	1.21	11	.81	11	.61	11	.40	11
1990	.49	13	.39	13	.30	13	.19	13	.093	13	.046	13	.031	13	.023	13	.015	13
1991	372	5	164	7	80.2	7	40.8	7	24.0	7	12.2	7	8.16	8	6.12	8	4.01	8
1992	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14
1993	333	7	234	5	128	5	63.5	5	32.5	5	20.1	5	15.1	6	13.3	6	9.10	6

Table E31.1. Mean flow, in cubic feet per second, for station 06425500, Elk Creek near Elm Springs

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1949	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.000	0.000	0.000	(2)
1950	0.000	0.000	0.000	0.000	0.000	3.64	138	77.5	1.44	.000	15.4	.000	19.7
1951	.000	.000	.000	.000	.000	6.57	.47	.98	15.0	3.66	.55	26.8	4.47
1952	.068	2.79	.000	.000	5.90	278	113	61.9	14.9	1.42	.000	.000	40.1
1953	.000	.000	.000	.000	.000	35.6	16.3	136	268	4.41	20.8	.000	40.1
1954	.000	.000	.000	.000	8.64	5.55	19.9	4.54	36.1	.010	.000	.000	6.12
1955	.000	.000	.000	.000	.62	.45	2.55	.000	.000	.82	.000	2.03	.53
1956	.000	.000	.000	.000	.052	7.25	.38	.97	.000	1.60	.000	.000	.87
1957	.000	.000	.000	.000	.000	.000	.13	268	51.7	1.18	.000	.000	27.1
1958	.000	.000	.000	.000	.000	.000	1.81	.087	45.2	.000	.000	.000	3.87
1959	.000	.000	.000	.000	.000	.000	.000	.11	.003	.000	.000	.000	.010
1960	.000	.000	.000	.000	.000	10.6	.15	.000	12.3	6.46	.000	.000	2.46
1961	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1962	.000	.000	.000	.000	.000	5.34	.010	428	165	72.5	2.89	.000	56.8
1963	.000	.000	.000	.000	.35	45.1	38.4	62.5	105	9.06	.000	.000	21.8
1964	.000	.000	.000	.78	3.05	3.75	6.80	8.64	215	3.80	.000	.000	19.9
1965	.000	.000	.000	2.10	5.41	6.77	19.3	436	168	68.7	8.94	6.23	60.7
1966	9.08	8.66	4.87	3.65	6.27	187	170	19.7	3.67	15.2	1.49	.000	35.9
1967	.000	1.28	5.35	3.20	6.96	15.4	42.6	315	708	47.9	9.23	5.65	96.4
1968	5.98	9.51	9.60	6.14	8.93	10.8	14.1	5.91	34.1	7.89	2.17	.036	9.55
1969	.000	.000	.000	.000	.000	56.7	34.1	33.2	.68	24.5	.86	.000	12.6
1970	.000	.000	.000	.000	.011	.022	288	49.2	51.5	2.72	.000	.000	32.3
1971	.000	.000	.000	.000	130	162	69.7	302	91.3	10.7	.52	.012	63.6
1972	1.63	10.5	6.12	2.56	15.6	18.7	5.83	26.9	220	48.1	15.7	3.06	31.0
1973	5.33	7.26	6.17	3.44	7.59	18.5	72.5	50.1	50.1	15.2	3.63	.23	20.0
1974	1.82	8.06	4.77	4.05	6.00	6.65	21.1	3.06	.59	.000	.000	.000	4.63
1975	.000	.000	.000	.000	.000	1.83	184	24.7	6.15	4.56	.000	.000	18.3
1976	.000	.000	.000	.000	1.99	2.99	3.45	2.74	158	7.87	1.53	.000	14.7
1977	.000	.000	.000	.000	1.61	7.52	192	21.2	14.2	.077	.000	.099	19.5
1978	.51	.092	.063	.000	.000	327	22.4	86.5	14.2	2.11	.29	.000	38.4
1979	.000	.022	.032	.000	.000	15.6	12.9	2.61	2.56	.53	.35	.000	2.90
1980	.004	.065	.069	.000	.000	.012	.016	.004	6.60	.23	.000	.000	.57
1981	.054	.000	.000	.000	.029	.000	.000	.000	.000	.000	.46	.000	.046
1982	.000	.000	.000	.000	.000	.17	.035	513	19.5	6.17	6.50	.070	46.3
1983	152	.98	1.25	2.98	3.67	12.1	52.4	107	4.30	8.48	.086	.001	29.2
1984	.042	.15	.000	.000	1.53	6.31	30.2	154	95.5	16.4	2.58	.027	25.6
1985	3.19	6.61	4.76	4.39	4.15	27.2	7.39	.97	.053	.000	.000	.000	4.91
1986	.000	.000	.000	.000	109	243	267	133	42.2	4.20	.45	2.59	66.3
1987	.34	6.11	5.63	4.31	4.59	37.1	87.9	80.8	16.6	.36	4.97	.018	20.8
1988	.19	.29	.15	.000	.003	11.7	9.61	4.85	.57	1.91	.012	.000	2.45
1989	.000	.000	.000	.000	.000	1.10	.52	.41	.000	.000	.000	.000	.17
1990	.000	.000	.12	.000	.26	.27	.043	.064	.053	.000	.000	2.22	.25
1991	.000	.000	.000	.000	.000	.000	.000	40.4	13.2	.75	.000	.000	4.58
1992	.000	.040	.000	.000	.44	.29	.000	.000	2.56	.001	.000	.000	.27
1993	.000	.000	.000	.000	.000	21.0	35.4	235	16.6	6.07	2.96	.16	26.8

[1]Indicates a no-value month.

[2]Incomplete water year.

Table E31.2. Statistics on mean flow, in cubic feet per second, for station 06425500, Elk Creek near Elm Springs (October 1949 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	44	44	44	44	44	44	44	44	44	44	44	44	44
Maximum	152	10.5	9.60	6.14	130	327	288	513	708	72.5	10.8	26.8	96.4
Percentile													
75th	0.064	0.25	0.11	0.58	5.20	20.4	49.9	102	51.6	8.33	2.48	0.061	32.0
50th	0.000	0.000	0.000	0.000	0.16	6.71	13.5	23.0	14.5	2.41	0.049	0.000	18.9
25th	0.000	0.000	0.000	0.000	0.000	0.33	0.21	0.97	0.87	0.027	0.000	0.000	2.57
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mean	4.10	1.42	1.11	0.85	7.56	36.35	45.01	84.04	60.69	9.22	2.33	1.12	21.19
Standard deviation	22.89	3.04	2.38	1.64	25.05	77.38	72.55	132.27	121.13	17.25	4.72	4.20	22.31
Skewness	6.57	2.00	2.05	1.73	4.45	2.73	2.07	1.94	3.93	2.70	2.62	5.63	1.34
Coefficient of variation	5.59	2.14	2.14	1.92	3.31	2.13	1.61	1.57	2.00	1.87	2.03	3.76	1.05
Percent of annual flow	1.61	0.56	0.44	0.34	2.98	14.32	17.73	33.11	23.91	3.63	0.92	0.44	[1]0.151

[1]Serial correlation for annual mean flows.

Table E31.3. Serial correlation for 1-year lag for monthly mean flow for station 06425500, Elk Creek near Elm Springs (October 1949 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.032	0.178	0.369	0.265	0.028	-0.054	0.005	-0.166	-0.007	0.088	-0.083	-0.073

Table E31.4. Correlation matrix for monthly mean flow for station 06425500, Elk Creek near Elm Springs (October 1949 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.041	0.068	0.257	-0.024	-0.033	0.028	0.013	-0.079	-0.001	-0.072	-0.047
Nov.	*	1.000	0.918	0.857	0.006	0.107	0.060	-0.182	0.020	0.145	0.198	-0.052
Dec.	*	*	1.000	0.935	0.002	-0.006	0.023	-0.088	0.235	0.201	0.228	-0.009
Jan.	*	*	*	1.000	-0.018	-0.018	0.022	-0.021	0.181	0.214	0.162	-0.007
Feb.	*	*	*	*	1.000	0.473	0.351	0.231	0.061	0.033	-0.042	0.008
Mar.	*	*	*	*	*	1.000	0.370	0.064	-0.066	-0.047	-0.091	-0.056
Apr.	*	*	*	*	*	*	1.000	-0.016	-0.068	-0.085	-0.008	-0.083
May	*	*	*	*	*	*	*	1.000	0.406	0.603	0.343	0.038
June	*	*	*	*	*	*	*	*	1.000	0.580	0.506	0.149
July	*	*	*	*	*	*	*	*	*	1.000	0.403	0.163
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.069
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E31.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06425500, Elk Creek near Elm Springs

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1950	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
1951	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.88	36	.70	35	1.46	34
1952	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	2	.0000	2	.0000	2
1953	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	3	.0000	3	.82	33
1954	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	4	.0000	4	.0000	3
1955	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	5	.0000	5	.33	32
1956	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	6	.0000	6	.0000	4
1957	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	7	.0000	7	.0000	5
1958	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	8	.0000	8	.0000	6
1959	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	9	.0000	9	.0000	7
1960	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	10	.0000	10	.0000	8
1961	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	11	.0000	11	.0000	9
1962	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	12	.0000	12	.0000	10
1963	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	13	.0000	13	.014	25
1964	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	14	.0000	14	.095	29
1965	2.00	43	2.00	43	2.07	43	2.11	43	3.45	42	4.13	41	4.80	41	5.74	42	6.37	41
1966	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.0000	15	.41	34	1.75	35
1967	.50	42	.52	42	.76	41	1.81	42	4.23	43	5.59	43	6.20	43	7.30	43	7.42	42
1968	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	.0000	16	.0000	15	.0010	21
1969	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	.0000	17	.0000	16	.0000	11
1970	.0000	19	.0000	19	.0000	19	.0000	19	.0000	19	.0000	19	.0000	18	.0000	17	.0000	12
1971	.0000	20	.0000	20	.0000	20	.0000	20	.008	39	.011	36	.62	35	1.83	37	3.46	37
1972	.28	41	.29	41	1.07	42	1.56	41	2.54	41	4.18	42	4.96	42	5.28	41	5.40	40
1973	.0000	21	.0000	21	.0000	21	.0000	21	.12	40	.87	39	1.83	39	3.37	40	3.74	39
1974	.0000	22	.0000	22	.0000	22	.0000	22	.0000	20	.0000	20	.0000	19	.0000	18	.0000	13
1975	.0000	23	.0000	23	.0000	23	.0000	23	.0000	21	.0000	21	.0000	20	.0000	19	.0000	14
1976	.0000	24	.0000	24	.0000	24	.0000	24	.0000	22	.0000	22	.0000	21	.0000	20	.060	28
1977	.0000	25	.0000	25	.0000	25	.0000	25	.0000	23	.0000	23	.008	32	.026	31	.13	31
1978	.0000	26	.0000	26	.0000	26	.0000	26	.0000	24	.0000	24	.007	31	.014	29	.009	23
1979	.0000	27	.0000	27	.0000	27	.0000	27	.0000	25	.0000	25	.003	30	.020	30	.023	26
1980	.0000	28	.0000	28	.0000	28	.0000	28	.0000	26	.0000	26	.0000	22	.0000	21	.009	24
1981	.0000	29	.0000	29	.0000	29	.0000	29	.0000	27	.0000	27	.0000	23	.0000	22	.0000	15
1982	.0000	30	.0000	30	.0000	30	.0000	30	.0010	37	1.05	40	1.70	38	2.19	38	27.2	43
1983	.0000	31	.0000	31	.0000	31	.0000	31	.0000	28	.0000	28	.030	33	.048	32	.046	27
1984	.0000	32	.0000	32	.0000	32	.0000	32	.004	38	.86	38	1.88	40	3.00	39	3.53	38
1985	.0000	33	.0000	33	.0000	33	.0000	33	.0000	29	.0000	29	.0000	24	.0000	23	.0000	16
1986	.0000	34	.0000	34	.0000	34	.0000	34	.0000	30	.25	37	1.11	37	1.18	36	2.98	36
1987	.0000	35	.0000	35	.0000	35	.0000	35	.0000	31	.0000	30	.041	34	.092	33	.11	30
1988	.0000	36	.0000	36	.0000	36	.0000	36	.0000	32	.0000	31	.0000	25	.0000	24	.0000	17
1989	.0000	37	.0000	37	.0000	37	.0000	37	.0000	33	.0000	32	.0000	26	.0000	25	.0000	18
1990	.0000	38	.0000	38	.0000	38	.0000	38	.0000	34	.0000	33	.0000	27	.0000	26	.0000	19
1991	.0000	39	.0000	39	.0000	39	.0000	39	.0000	35	.0000	34	.0000	28	.007	28	.007	22
1992	.0000	40	.0000	40	.0000	40	.0000	40	.0000	36	.0000	35	.0000	29	.0000	27	.0000	20

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E31.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06425500, Elk Creek near Elm Springs

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1950	703	22	580	21	351	20	231	21	163	20	110	17	74.3	18	55.8	20	39.2	18
1951	200	31	170	29	105	29	53.5	29	27.3	31	13.7	33	14.1	30	11.8	29	8.91	30
1952	3,640	4	2,647	2	1,468	3	750	5	396	5	215	7	158	7	120	7	79.8	8
1953	3,190	5	2,274	5	1,086	8	531	11	269	11	206	8	142	9	116	9	80.0	7
1954	390	26	274	26	134	28	69.6	28	39.4	28	20.4	29	21.0	26	17.0	26	12.2	27
1955	55.0	35	20.3	37	8.71	40	4.65	39	2.55	39	1.70	38	1.20	38	.90	38	.89	38
1956	25.0	39	16.5	39	13.7	37	11.3	37	7.40	36	3.95	36	2.98	36	2.25	36	1.74	36
1957	2,210	9	1,556	10	1,032	10	572	9	320	9	165	12	110	12	82.6	12	54.2	13
1958	284	28	230	28	144	27	87.4	26	45.2	27	23.6	27	15.7	29	11.8	30	7.72	32
1959	3.40	43	1.17	43	.50	43	.24	43	.12	43	.060	43	.040	43	.030	43	.020	43
1960	256	30	119	31	65.2	31	35.8	32	19.0	35	9.49	35	6.32	35	7.51	34	4.92	34
1961	.0000	44	.0000	44	.0000	44	.0000	44	.0000	44	.0000	44	.0000	44	.0000	44	.0000	44
1962	3,790	3	2,148	6	1,178	5	905	3	558	2	331	2	228	4	171	5	113	5
1963	684	23	515	22	311	22	182	22	107	23	86.7	20	72.1	21	63.7	16	43.4	16
1964	1,900	12	1,147	14	732	13	398	13	217	15	112	16	77.1	16	59.1	17	39.8	17
1965	3,000	6	2,337	4	1,386	4	827	4	481	4	329	3	230	3	177	4	119	4
1966	721	21	707	18	534	17	323	17	245	13	185	10	127	11	97.4	11	67.1	10
1967	3,820	2	2,687	1	1,956	1	1,183	1	723	1	518	1	369	1	282	1	189	1
1968	356	27	151	30	76.9	30	40.6	31	34.8	29	21.1	28	18.1	28	16.2	27	13.9	26
1969	575	24	344	25	234	24	117	25	64.4	25	62.0	25	42.4	25	31.9	25	25.2	25
1970	2,290	8	1,803	8	1,107	7	560	10	306	10	177	11	131	10	98.2	10	64.4	11
1971	2,450	7	2,000	7	1,018	11	584	8	338	8	216	6	196	5	181	3	127	3
1972	1,370	16	757	17	433	19	389	14	245	14	138	14	99.3	14	78.2	14	57.1	12
1973	896	18	449	23	224	25	122	24	77.1	24	75.7	24	59.0	22	48.2	22	35.5	22
1974	54.0	36	52.0	35	48.6	33	35.3	33	21.5	33	14.0	32	11.2	32	9.59	32	8.37	31
1975	767	20	602	20	335	21	241	20	197	17	105	19	72.5	19	55.6	21	36.5	21
1976	1,550	13	943	16	558	16	297	19	164	19	84.1	22	57.4	24	43.6	24	29.3	24
1977	1,260	17	995	15	647	14	360	15	198	16	107	18	76.0	17	58.9	18	38.9	19
1978	1,930	11	1,597	9	1,149	6	657	6	346	7	206	9	153	8	116	8	76.5	9
1979	52.0	37	41.7	36	37.6	35	30.3	35	23.4	32	15.2	31	11.1	33	8.60	33	5.78	33
1980	74.0	32	54.0	34	26.8	36	12.7	36	6.77	37	3.42	37	2.29	37	1.72	37	1.13	37
1981	7.50	41	4.74	41	2.03	42	.95	42	.47	42	.24	42	.16	42	.12	42	.082	42
1982	3,880	1	2,560	3	1,480	2	1,018	2	544	3	275	5	185	6	141	6	92.2	6
1983	1,450	15	1,265	13	644	15	312	18	158	21	82.7	23	58.6	23	45.8	23	31.8	23
1984	813	19	688	19	530	18	328	16	182	18	136	15	98.6	15	75.3	15	51.0	15
1985	70.0	33	70.0	32	58.6	32	42.6	30	29.0	30	17.8	30	13.2	31	11.0	31	9.16	28
1986	1,540	14	1,333	12	1,071	9	607	7	348	6	291	4	252	2	200	2	132	2
1987	533	25	357	24	267	23	166	23	110	22	84.3	21	72.3	20	56.6	19	38.7	20
1988	65.0	34	54.3	33	43.4	34	32.1	34	20.2	34	12.8	34	8.90	34	7.25	35	4.79	35
1989	4.70	42	3.43	42	2.66	41	2.08	41	1.18	41	.99	41	.70	41	.52	41	.34	41
1990	31.0	38	18.9	38	9.50	38	4.43	40	2.22	40	1.11	40	.74	40	.58	40	.42	40
1991	279	29	269	27	159	26	83.2	27	50.3	26	27.6	26	18.6	27	13.9	28	9.14	29
1992	21.0	40	14.1	40	9.07	39	5.12	38	2.56	38	1.28	39	.85	39	.73	39	.54	39
1993	2,170	10	1,475	11	901	12	471	12	254	12	147	13	105	13	79.3	13	53.4	14

Table E32.1. Mean flow, in cubic feet per second, for station 06428500, Belle Fourche River at Wyoming-South Dakota State line

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1947	(1)	(1)	34.8	45.5	197	538	456	152	524	133	26.7	9.23	(2)
1948	14.1	16.6	13.2	11.5	23.5	495	139	71.3	232	162	28.1	.48	101
1949	.60	9.52	8.35	16.5	14.6	513	472	177	127	40.8	.60	.000	115
1950	2.78	6.07	2.64	.032	4.79	51.2	589	442	75.5	17.5	6.23	.027	99.8
1951	4.67	8.85	9.16	8.13	15.5	24.3	26.1	14.0	33.3	14.4	27.6	145	27.4
1952	18.7	13.2	4.58	2.16	42.3	146	301	95.8	32.6	29.3	18.2	15.1	59.6
[3]1953	.000	.16	.65	3.26	3.04	64.3	53.0	221	287	84.8	251	42.1	84.7
1954	6.65	11.0	8.29	4.65	15.8	30.5	59.0	22.0	25.4	18.3	23.5	.000	18.7
1955	.000	3.60	5.29	1.45	.57	19.0	360	295	228	91.7	78.6	109	99.3
1956	34.0	7.17	38.6	18.7	15.6	174	139	57.7	51.3	22.2	17.6	.21	48.2
1957	.000	11.5	5.19	1.35	2.71	93.8	55.2	76.4	158	77.8	34.3	14.6	44.4
1958	3.22	7.50	8.03	5.81	13.2	50.9	144	99.5	33.3	66.2	47.2	1.48	40.2
1959	.000	2.97	2.79	.29	.20	141	119	64.4	51.8	99.7	36.1	.033	43.5
1960	.000	.58	5.16	.17	.66	255	98.7	103	31.6	2.94	26.8	4.86	44.5
1961	.000	.000	.000	.000	6.42	49.2	18.2	3.10	11.9	3.17	.10	.000	7.69
1962	.000	.000	.000	5.48	117	224	222	695	624	212	41.8	20.0	180
1963	25.3	23.4	20.7	4.55	64.5	167	263	222	249	44.8	53.3	43.1	98.2
1964	10.2	18.5	8.55	10.5	12.3	34.8	85.5	109	464	128	80.6	22.1	81.6
1965	19.8	23.1	15.6	19.7	24.9	62.0	330	388	198	78.2	22.8	19.2	100
1966	29.9	27.1	22.4	18.3	11.6	127	90.8	53.2	82.8	123	41.8	11.7	53.6
1967	16.7	26.5	17.6	12.3	30.4	257	101	320	222	59.6	93.2	75.5	103
1968	19.9	21.1	18.7	18.8	25.0	152	55.9	49.6	86.3	70.3	62.1	23.9	50.4
1969	14.1	16.5	14.5	6.84	2.86	159	200	378	91.0	128	68.9	38.5	94.1
1970	19.7	22.3	18.5	13.9	18.5	51.5	236	407	211	82.3	75.8	19.7	98.5
1971	19.0	26.4	23.3	11.8	110	145	823	272	252	92.0	88.3	39.3	158
1972	118	65.9	24.5	28.7	74.3	931	160	299	362	110	92.1	51.0	194
1973	95.4	37.0	24.4	46.0	47.4	115	251	254	266	97.9	81.0	41.7	113
1974	42.6	48.2	41.0	59.4	86.3	149	178	97.1	54.1	126	101	33.6	84.7
1975	24.3	28.6	13.1	11.2	21.8	100	241	429	159	101	98.6	47.7	107
1976	23.3	22.7	18.7	23.9	37.4	77.3	85.0	60.3	473	120	77.9	79.7	91.1
1977	26.9	30.9	13.0	15.5	18.8	59.8	282	92.1	63.2	102	222	36.7	80.5
1978	55.0	23.4	20.7	18.4	19.2	457	144	1,104	628	113	89.9	47.8	229
1979	29.3	26.4	21.0	6.56	8.66	159	144	51.9	132	66.0	65.6	17.3	60.8
1980	12.4	15.6	13.5	6.44	12.0	49.1	44.0	39.1	62.8	67.3	271	46.4	53.6
1981	18.6	12.9	12.1	8.59	15.2	15.7	89.4	223	195	303	131	77.8	92.4
1982	13.0	11.1	7.42	3.11	5.74	34.5	24.1	456	137	90.5	86.0	39.0	76.5
1983	86.6	37.0	33.7	51.6	89.2	160	127	148	53.7	122	89.5	28.7	85.8
1984	25.5	21.7	11.2	18.3	31.2	143	90.7	355	812	109	44.1	20.5	140
1985	26.1	30.5	19.7	12.5	8.30	136	59.1	71.4	48.0	87.7	57.4	21.6	48.6
1986	16.4	11.0	4.53	15.5	27.5	111	143	259	102	84.4	69.1	65.3	76.0
1987	52.9	26.3	28.7	15.8	37.1	148	221	141	74.5	123	85.7	29.8	82.4
1988	24.7	28.9	12.6	2.61	11.4	63.5	72.5	80.3	105	103	80.5	45.4	52.7
1989	15.0	11.9	10.5	3.58	5.52	132	55.9	111	52.5	92.4	82.2	36.2	51.2
1990	13.2	16.0	22.4	34.5	24.5	81.4	37.9	128	56.2	89.2	86.2	30.6	52.0
1991	10.5	11.0	8.02	2.51	13.7	21.9	31.7	158	86.1	73.2	91.4	48.4	46.7
1992	11.6	18.4	15.8	6.18	15.3	17.4	15.1	36.0	33.5	46.2	45.7	20.5	23.5
1993	7.26	9.59	2.53	.57	1.07	118	74.6	100	363	221	67.8	57.0	85.4

[1]Indicates a no-value month.

[2]Incomplete water year.

[3]Flow regulated by Keyhole Reservoir since water year 1953.

Table E32.2. Statistics on mean flow, in cubic feet per second, for station 06428500, Belle Fourche River at Wyoming-South Dakota State line (October 1952 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	41	41	41	41	41	41	41	41	41	41	41	41	41
Maximum	118	65.9	41.0	59.4	117	931	823	1,104	812	303	271	109	229
Percentile													
75th	26.5	26.5	20.8	18.3	30.8	155	210	297	250	116	89.7	47.0	98.9
50th	18.6	18.5	13.5	10.5	15.6	115	101	128	105	91.7	77.9	33.6	81.6
25th	8.73	11.0	7.72	3.42	7.36	51.2	57.4	67.9	53.9	68.8	44.9	19.5	49.5
Minimum	0.000	0.000	0.000	0.000	0.20	15.7	15.1	3.10	11.9	2.94	0.10	0.000	7.69
Mean	23.59	19.37	14.95	13.40	26.51	135.04	146.93	208.03	187.24	95.92	79.50	34.34	82.33
Standard deviation	25.74	13.45	9.94	13.82	29.70	152.10	139.48	208.11	186.00	54.46	55.29	24.19	46.04
Skewness	2.16	1.06	0.67	1.80	1.79	3.94	3.06	2.40	1.72	1.57	2.09	0.84	1.28
Coefficient of variation	1.09	0.69	0.67	1.03	1.12	1.13	0.95	1.00	0.99	0.57	0.70	0.70	0.56
Percent of annual flow	2.39	1.97	1.52	1.36	2.69	13.71	14.92	21.12	19.01	9.74	8.07	3.49	[1]0.152

[1]Serial correlation for annual mean flows.

Table E32.3. Serial correlation for 1-year lag for monthly mean flow for station 06428500, Belle Fourche River at Wyoming-South Dakota State line (October 1952 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.416	0.555	0.032	0.314	0.282	0.027	0.137	-0.201	-0.133	-0.182	0.171	-0.058

Table E32.4. Correlation matrix for monthly mean flow for station 06428500, Belle Fourche River at Wyoming-South Dakota State line (October 1952 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.821	0.672	0.712	0.458	0.635	0.137	0.170	0.135	0.117	0.072	0.113
Nov.	*	1.000	0.693	0.680	0.464	0.533	0.215	0.045	0.073	0.111	0.137	0.155
Dec.	*	*	1.000	0.760	0.438	0.279	0.229	-0.049	-0.136	-0.042	-0.007	-0.037
Jan.	*	*	*	1.000	0.542	0.243	0.117	0.040	0.044	0.128	0.067	0.047
Feb.	*	*	*	*	1.000	0.359	0.529	0.256	0.300	0.228	-0.016	0.063
Mar.	*	*	*	*	*	1.000	0.076	0.358	0.308	0.031	-0.061	0.059
Apr.	*	*	*	*	*	*	1.000	0.268	0.136	0.061	0.016	0.168
May	*	*	*	*	*	*	*	1.000	0.611	0.272	0.019	0.254
June	*	*	*	*	*	*	*	*	1.000	0.403	0.002	0.262
July	*	*	*	*	*	*	*	*	*	1.000	0.209	0.408
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.416
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E32.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06428500, Belle Fourche River at Wyoming-South Dakota State line

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1953	2.00	14	2.00	13	2.29	13	2.57	14	3.67	14	5.67	14	7.29	13	7.38	10	10.9	11
1954	.0000	1	.0000	1	.0000	1	.0000	1	.0000	1	.0000	1	.59	4	1.79	5	1.81	4
1955	4.00	20	4.00	20	4.57	20	5.00	19	5.80	18	7.85	18	21.9	35	19.9	32	37.1	35
1956	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	2.74	7	4.06	7	3.30	6
1957	.10	8	.10	8	.14	8	.50	8	1.54	8	3.92	10	5.42	9	5.82	8	8.45	8
1958	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.065	6	1.12	5	1.52	4	1.38	3
1959	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	3	.13	3	1.46	3	1.10	2
1960	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	4	.0000	1	.0000	1	1.95	5
1961	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	5	.0000	2	.0000	2	.045	1
1962	2.00	15	2.00	14	2.00	12	2.50	12	4.13	15	10.5	23	15.2	23	16.9	21	20.1	22
1963	2.00	16	2.50	16	2.64	15	3.86	16	8.33	22	9.10	19	10.4	18	11.9	17	12.8	13
1964	5.00	24	7.33	28	9.14	29	9.86	29	13.1	32	16.9	32	19.0	30	18.7	26	21.2	24
1965	8.60	31	9.00	30	9.29	30	10.0	30	10.6	26	15.2	31	16.7	28	19.6	31	21.5	26
1966	1.90	13	2.47	15	3.14	17	5.14	22	9.23	24	14.2	26	15.6	24	17.8	23	18.3	19
1967	13.0	37	14.3	37	15.1	37	15.7	36	17.0	35	18.3	33	19.3	31	19.5	30	29.7	34
1968	.0000	7	.0000	7	.0000	7	.89	10	2.42	11	3.97	11	5.80	10	9.00	13	10.9	12
1969	10.0	32	10.3	34	11.0	33	11.2	32	12.7	30	14.6	28	16.5	27	17.9	24	20.7	23
1970	7.00	27	7.00	25	7.50	25	8.00	24	11.6	28	15.0	30	19.4	33	20.0	33	24.3	29
1971	15.0	38	16.3	38	18.4	39	18.6	39	23.3	40	25.6	38	29.9	37	38.7	38	53.2	40
1972	10.0	33	10.0	32	10.3	31	13.8	35	21.8	39	25.5	37	34.3	38	37.7	37	51.1	38
1973	8.00	29	8.17	29	8.64	28	9.21	28	20.3	37	35.1	39	39.0	39	39.1	39	50.5	37
1974	7.00	28	7.00	26	7.57	26	8.32	26	9.52	25	11.9	24	13.8	22	18.1	25	22.4	27
1975	12.0	35	13.3	36	14.6	36	15.9	37	16.7	34	18.9	35	20.8	34	21.4	35	25.3	31
1976	10.0	34	10.0	33	10.7	32	11.8	33	13.0	31	14.2	27	15.6	25	18.8	27	27.1	32
1977	15.0	39	17.0	39	17.7	38	18.2	38	18.4	36	18.8	34	19.3	32	20.2	34	27.5	33
1978	4.00	21	4.17	21	4.79	22	5.04	20	6.48	20	7.53	17	11.5	19	14.6	20	21.3	25
1979	4.00	22	4.33	22	4.64	21	5.11	21	5.32	17	6.74	15	9.11	15	10.8	14	12.8	14
1980	6.30	26	7.23	27	7.86	27	8.04	25	8.41	23	9.25	20	10.3	17	11.2	15	13.9	16
1981	2.50	17	2.67	17	2.76	16	2.79	15	3.01	13	3.75	9	5.33	8	6.70	9	10.8	10
1982	18.0	40	18.0	40	18.9	40	19.9	40	21.5	38	35.2	40	39.1	40	43.6	40	52.4	39
1983	5.80	25	6.33	24	7.14	24	8.44	27	10.8	27	13.8	25	16.8	29	19.1	29	22.8	28
1984	4.00	23	4.67	23	4.94	23	5.53	23	8.06	21	10.2	22	12.7	21	16.9	22	19.4	21
1985	3.00	19	3.17	19	3.64	18	3.93	17	4.43	16	7.23	16	9.53	16	11.5	16	15.4	18
1986	12.0	36	12.0	35	12.4	35	13.1	34	14.5	33	19.9	36	22.2	36	24.5	36	37.4	36
1987	.90	11	1.00	11	1.29	11	1.78	11	2.03	10	3.30	8	7.84	14	13.2	19	18.3	20
1988	1.50	12	1.67	12	2.36	14	2.54	13	2.70	12	4.39	13	6.08	11	7.48	11	12.9	15
1989	8.50	30	9.33	31	11.0	34	11.0	31	11.9	29	14.6	29	16.4	26	18.9	28	24.9	30
1990	.60	10	.65	10	.71	10	.81	9	1.60	9	4.33	12	6.79	12	7.84	12	10.3	9
1991	2.50	18	2.67	18	3.86	19	4.11	18	6.08	19	9.27	21	11.8	20	12.8	18	14.1	17
1992	.20	9	.22	9	.25	9	.33	7	.54	7	.81	7	1.31	6	3.16	6	5.41	7

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E32.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06428500, Belle Fourche River at Wyoming-South Dakota State line

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1953	1,760	9	1,246	10	813	12	450	18	313	20	261	18	239	15	216	15	164	15
1954	262	38	178	38	128	38	84.5	40	62.2	39	45.7	40	39.1	40	35.7	40	31.5	40
1955	1,460	12	1001	16	634	19	545	13	363	14	331	10	296	7	245	7	193	6
1956	409	35	372	35	351	27	301	25	219	25	160	26	125	28	107	28	79.0	36
1957	434	34	393	31	328	32	255	27	187	30	142	30	107	31	96.8	31	82.3	32
1958	499	33	385	32	329	31	251	29	175	31	131	31	101	33	86.6	36	74.5	38
1959	594	29	551	24	436	24	280	26	203	26	146	28	112	30	106	30	85.7	31
1960	1,400	13	1,270	9	889	10	563	11	342	16	223	20	164	22	125	25	87.6	28
1961	112	40	106	40	93.0	40	85.0	39	57.8	40	36.5	41	25.7	41	21.0	41	15.3	41
1962	3,760	1	2,920	1	2,361	1	1,525	2	1,166	2	745	2	526	2	463	2	349	2
1963	714	23	560	23	505	22	363	22	290	21	269	17	269	10	229	10	169	14
1964	2,060	5	1,436	8	899	9	741	8	533	7	316	12	237	16	199	17	150	18
1965	1,510	11	1,158	12	711	16	539	14	426	11	364	6	308	6	252	6	180	8
1966	676	26	383	34	300	35	205	35	148	36	117	34	95.0	37	91.7	35	86.9	29
1967	1,110	18	1,070	13	830	11	534	15	328	17	275	16	237	17	228	11	176	12
1968	500	32	440	29	355	26	234	32	156	34	105	36	86.7	38	86.6	37	79.6	35
1969	1,260	15	1,170	11	1,040	8	676	9	416	12	345	9	262	11	222	12	177	11
1970	1,160	17	1,017	15	791	14	583	10	444	9	355	7	289	8	238	9	178	10
1971	1,840	8	1,557	7	1200	7	1,017	5	832	4	562	5	467	4	379	4	285	4
1972	2,030	6	1,960	5	1,657	3	1,330	4	956	3	567	4	470	3	445	3	330	3
1973	1,040	19	826	19	618	20	475	17	345	15	318	11	260	12	222	13	178	9
1974	688	24	530	26	331	29	254	28	195	28	166	25	146	25	131	24	120	24
1975	1,250	16	956	17	752	15	551	12	444	10	347	8	283	9	241	8	189	7
1976	2,220	4	2,020	4	1515	5	857	7	481	8	302	14	225	19	189	19	153	17
1977	870	22	820	20	580	21	411	21	283	22	189	23	147	24	138	22	138	20
1978	1,980	7	1,720	6	1,577	4	1,563	1	1,358	1	884	1	746	1	604	1	427	1
1979	350	37	300	37	253	36	221	33	201	27	160	27	127	27	125	26	104	25
1980	386	36	371	36	317	33	308	24	278	23	178	24	135	26	117	27	90.8	26
1981	1,000	20	917	18	638	18	443	19	326	18	250	19	245	13	221	14	171	13
1982	2,410	3	2,170	3	1,373	6	869	6	534	6	308	13	244	14	199	16	141	19
1983	568	30	384	33	248	37	196	36	171	32	143	29	150	23	133	23	121	23
1984	2,830	2	2,277	2	1,763	2	1,464	3	825	5	587	3	431	5	363	5	260	5
1985	510	31	453	28	362	25	244	31	160	33	102	37	96.2	36	85.2	38	78.1	37
1986	921	21	746	21	677	17	416	20	316	19	223	21	174	21	157	20	129	22
1987	681	25	546	25	462	23	313	23	221	24	189	22	175	20	150	21	133	21
1988	150	39	123	39	117	39	112	38	108	38	107	35	98.2	34	93.3	33	86.4	30
1989	620	28	494	27	338	28	205	34	151	35	123	33	104	32	93.4	32	90.8	27
1990	1,350	14	627	22	330	30	186	37	131	37	101	38	97.3	35	92.1	34	80.2	34
1991	623	27	403	30	311	34	247	30	194	29	127	32	114	29	106	29	81.9	33
1992	86.0	41	84.7	41	82.3	41	73.8	41	55.8	41	46.8	39	45.7	39	43.5	39	33.7	39
1993	1,690	10	1,070	14	803	13	500	16	412	13	299	15	230	18	193	18	160	16

Table E33.1. Mean flow, in cubic feet per second, for station 06430000, Murray Ditch at Wyoming-South Dakota State line

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1954	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.28	7.92	7.91	6.59	(2)
1955	3.01	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.28	8.46	7.54	3.79	(2)
1956	3.00	0.10	(1)	(1)	(1)	(1)	(1)	0.90	9.11	10.1	8.84	7.01	(2)
1957	1.65	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	8.56	8.02	.96	(2)
1958	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.90	12.2	9.47	6.75	(2)
1959	4.99	.38	(1)	(1)	(1)	(1)	(1)	4.59	8.17	8.93	9.03	9.19	(2)
1960	2.47	.34	(1)	(1)	(1)	(1)	(1)	4.45	9.33	8.84	11.2	6.77	(2)
1961	3.89	2.69	0.000	0.000	0.000	0.000	1.25	8.61	10.6	7.60	8.15	5.31	4.03
1962	3.03	1.68	.000	.000	.000	.000	.47	6.49	1.43	.78	6.51	3.35	2.00
1963	2.55	.98	.000	.000	.000	.000	.000	.000	5.08	9.75	8.05	8.66	2.94
1964	6.92	2.23	.000	.000	.000	.000	.000	.11	3.44	5.80	11.9	7.63	3.18
1965	10.4	4.26	.000	.000	.000	.000	.000	.071	1.15	6.83	4.87	8.78	3.05
1966	5.45	3.15	.000	.000	.000	.000	.000	.47	6.56	10.6	9.96	8.70	3.76
1967	1.11	.65	.000	.000	.000	.000	.000	.000	.000	8.11	10.7	6.31	2.27
1968	.64	.012	.000	.000	.000	.000	.000	.000	1.81	12.0	8.43	8.03	2.59
1969	6.99	2.42	.000	.000	.000	.000	.000	.000	2.92	13.9	16.1	15.6	4.85
1970	15.9	.34	.000	.000	.000	.000	.000	.042	.21	12.2	14.4	6.40	4.19
1971	2.47	1.02	.000	.000	.000	.000	.000	.000	.006	13.1	16.0	7.82	3.41
1972	.046	.000	.000	.000	.000	.000	.000	.000	1.64	4.50	7.36	1.63	1.28
1973	.70	1.63	.000	.000	.000	.000	.000	.003	1.02	17.8	14.0	1.01	3.06
1974	3.49	.44	.000	.000	.000	.000	.000	.000	.000	13.1	15.3	9.59	3.53
1975	7.75	.000	.000	.000	.000	.000	.000	.000	.000	17.9	13.9	8.79	4.08
1976	4.71	5.30	.000	.000	.000	.000	.000	5.03	2.95	5.38	11.3	9.48	3.69
1977	2.22	.000	.000	.000	.000	.000	.000	.000	7.43	13.2	16.3	9.24	4.06
1978	12.7	2.21	.000	.000	.000	.000	.000	.046	3.01	10.1	8.26	12.0	4.06
1979	7.97	.000	.000	.000	.000	.008	.000	.000	12.6	13.1	8.74	4.07	3.91
1980	5.93	.044	.000	.000	.000	.000	.000	4.19	4.20	10.7	13.8	4.48	3.65
1981	6.64	2.17	.000	.000	.000	.000	2.93	8.92	5.54	12.3	9.91	6.15	4.59
1982	10.1	1.49	.000	.000	.000	.000	.000	.010	.000	8.15	13.4	14.0	3.96
1983	2.00	.000	.000	.000	.000	.000	.000	.000	3.27	18.2	15.6	12.9	4.37
1984	8.09	.000	.000	.000	.000	.000	.000	.000	1.50	14.2	10.8	15.2	4.18
1985	10.1	.74	.000	.000	.000	.000	.000	14.0	15.2	9.82	13.8	14.5	6.55
1986	6.38	.47	.000	.000	.000	.000	.000	.000	.060	4.80	12.2	3.10	2.28
1987	.000	.000	.000	.000	.000	.000	(1)	(1)	(1)	(1)	(1)	(1)	(2)

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E33.2. Statistics on mean flow, in cubic feet per second, for station 06430000, Murray Ditch at Wyoming-South Dakota State line (October 1960 through September 1986)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	26	26	26	26	26	26	26	26	26	26	26	26	26
Maximum	15.9	5.30	.000	.000	.000	.008	2.93	14.0	15.2	18.2	16.3	15.6	2.28
Percentile													
75th	8.00	2.21	0.000	0.000	0.000	0.000	0.000	1.40	5.19	13.1	14.1	10.2	4.10
50th	5.69	0.86	0.000	0.000	0.000	0.000	0.000	0.002	2.36	10.6	11.6	8.34	3.72
25th	2.41	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.17	7.41	8.39	5.10	3.02
Minimum	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.78	4.87	1.01	1.28
Mean	5.70	1.30	0.00	0.00	0.00	0.00	0.18	1.85	3.52	10.54	11.53	8.18	3.60
Standard deviation	4.00	1.42	0.00	0.00	0.00	0.00	0.62	3.72	4.07	4.35	3.31	4.07	1.05
Skewness	0.67	1.23	(1)	(1)	(1)	5.10	4.04	2.09	1.57	-0.15	-0.21	0.20	0.27
Coefficient of variation	0.70	1.09	(1)	(1)	(1)	5.10	3.45	2.02	1.15	0.41	0.29	0.50	0.29
Percent of annual flow	13.32	3.05	0.00	0.00	0.00	0.00	0.42	4.31	8.23	24.62	26.94	19.12	[1]0.091

[1]Statistic not computed.
[2]Serial correlation for annual mean flows.

Table E33.3. Serial correlation for 1-year lag for monthly mean flow for station 06430000, Murray Ditch at Wyoming-South Dakota State line (October 1960 through September 1986)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.129	-0.058	(1)	(1)	(1)	-0.042	-0.005	0.056	-0.134	-0.001	0.110	0.279

[1]Statistic not computed.

Table E33.4. Correlation matrix for monthly mean flow for station 06430000, Murray Ditch at Wyoming-South Dakota State line (October 1960 through September 1986)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.162	(1)	(1)	(1)	0.116	-0.012	0.092	0.091	-0.005	0.010	0.370
Nov.	*	1.000	(1)	(1)	(1)	-0.187	0.202	0.228	0.029	-0.385	-0.329	0.096
Dec.	*	*	1.000	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Jan.	*	*	*	1.000	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Feb.	*	*	*	*	1.000	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Mar.	*	*	*	*	*	1.000	-0.059	-0.101	0.455	0.120	-0.172	-0.206
Apr.	*	*	*	*	*	*	1.000	0.546	0.219	-0.046	-0.222	-0.188
May	*	*	*	*	*	*	*	1.000	0.607	-0.269	-0.120	0.015
June	*	*	*	*	*	*	*	*	1.000	0.015	-0.107	0.088
July	*	*	*	*	*	*	*	*	*	1.000	0.578	0.291
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.319
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

[1]Statistic not computed.

Table E33.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06430000, Murray Ditch at Wyoming-South Dakota State line

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1961	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	.0000	1	0.0000	1	.81	11
1962	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.60	8
1963	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	1.54	19
1964	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	2.49	24
1965	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	1.47	17
1966	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.34	4
1967	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.11	3
1968	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	1.61	20
1969	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	2.91	26
1970	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.61	9
1971	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.008	2
1972	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.39	6
1973	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.67	10
1974	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	1.38	15
1975	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	1.67	21
1976	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.39	7
1977	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	2.54	25
1978	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	1.40	16
1979	.0000	19	.0000	19	.0000	19	.0000	19	.0000	19	.0000	19	.0000	19	.0000	19	1.01	12
1980	.0000	20	.0000	20	.0000	20	.0000	20	.0000	20	.0000	20	.0000	20	.0000	20	1.48	18
1981	.0000	21	.0000	21	.0000	21	.0000	21	.0000	21	.0000	21	.0000	21	.0000	21	2.00	23
1982	.0000	22	.0000	22	.0000	22	.0000	22	.0000	22	.0000	22	.0000	22	.0000	22	.38	5
1983	.0000	23	.0000	23	.0000	23	.0000	23	.0000	23	.0000	23	.0000	23	.0000	23	1.37	14
1984	.0000	24	.0000	24	.0000	24	.0000	24	.0000	24	.0000	24	.0000	24	.0000	24	1.90	22
1985	.0000	25	.0000	25	.0000	25	.0000	25	.0000	25	.0000	25	.0000	25	.0000	25	1.24	13
1986	.0000	26	.0000	26	.0000	26	.0000	26	.0000	26	.0000	26	.0000	26	.0000	26	.0000	1

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E33.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06430000, Murray Ditch at Wyoming-South Dakota State line

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1961	20.0	19	19.3	18	17.9	16	14.4	19	11.1	22	9.60	23	9.43	18	8.83	14	6.93	7
1962	15.0	24	11.0	26	10.6	26	10.0	26	8.80	26	5.06	26	3.66	26	3.83	26	3.19	25
1963	14.0	26	13.0	25	12.9	25	11.5	25	10.7	24	9.64	22	8.88	20	8.03	18	5.27	19
1964	16.0	22	15.3	23	14.9	23	13.3	22	12.1	20	9.84	21	8.48	22	7.27	21	4.82	21
1965	16.0	23	15.7	22	13.9	24	12.4	23	11.0	23	7.86	24	6.92	23	5.50	23	3.62	23
1966	20.0	20	18.3	19	16.0	21	13.5	20	11.8	21	10.3	18	9.80	15	8.99	13	6.06	13
1967	22.0	14	20.7	15	18.3	15	15.5	16	12.2	19	11.7	14	8.60	21	6.45	22	4.23	22
1968	22.0	15	21.3	13	19.4	12	17.9	12	12.4	18	10.9	17	9.67	16	7.73	19	5.07	20
1969	30.0	7	25.3	9	20.6	11	19.0	10	18.8	5	15.9	5	15.3	2	12.4	3	8.10	3
1970	33.0	5	33.0	4	32.0	2	26.1	3	18.1	7	14.9	8	11.3	12	8.53	16	5.60	17
1971	28.0	9	26.0	7	24.4	7	23.1	6	18.1	8	16.6	4	12.6	8	9.48	10	6.22	12
1972	30.0	8	25.0	10	16.6	18	12.1	24	9.60	25	6.21	25	4.68	25	3.88	25	2.55	26
1973	37.0	1	36.0	1	32.6	1	26.9	2	22.3	1	17.0	3	11.6	11	8.73	15	5.73	15
1974	21.0	18	17.0	20	16.6	19	16.3	15	15.7	10	14.9	9	12.8	7	9.73	8	6.38	10
1975	34.0	3	33.3	2	27.0	5	25.4	5	19.1	4	17.1	2	13.8	4	10.4	6	6.83	8
1976	20.0	21	16.7	21	16.1	20	15.2	17	13.0	14	11.5	15	8.89	19	7.68	20	5.71	16
1977	34.0	4	33.3	3	30.1	3	25.5	4	21.6	2	15.5	6	14.2	3	11.7	4	7.73	4
1978	22.0	16	21.3	14	18.6	14	16.4	14	13.0	15	10.2	19	10.2	14	8.51	17	5.59	18
1979	27.0	10	23.3	12	22.1	8	20.5	8	14.4	13	13.4	12	11.7	10	9.79	7	6.44	9
1980	26.0	12	25.0	11	21.3	10	17.7	13	15.2	12	13.0	13	10.4	13	9.57	9	6.29	11
1981	25.0	13	20.3	17	17.9	17	15.2	18	12.5	17	11.3	16	9.52	17	9.35	11	7.67	5
1982	22.0	17	20.7	16	19.0	13	18.8	11	15.6	11	14.4	10	12.1	9	9.06	12	5.94	14
1983	31.0	6	31.0	5	29.4	4	27.3	1	20.3	3	18.3	1	15.8	1	12.8	2	8.37	2
1984	35.0	2	27.7	6	21.4	9	20.6	7	18.1	9	14.3	11	13.6	5	10.7	5	6.98	6
1985	27.0	11	26.0	8	24.9	6	20.0	9	18.8	6	15.0	7	13.5	6	13.6	1	11.2	1
1986	15.0	25	15.0	24	15.0	22	13.5	21	12.6	16	10.2	20	6.88	24	5.18	24	3.40	24

Table E34.1. Mean flow, in cubic feet per second, for station 06430500, Redwater Creek at Wyoming-South Dakota State line

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1929	(1)	(1)	(1)	(1)	(1)	(1)	(1)	178	136	82.4	58.7	64.1	(1)
1930	67.2	69.5	60.0	58.0	63.1	59.1	64.7	64.4	64.7	46.3	42.0	51.0	59.1
1931	54.6	58.0	58.0	53.8	55.0	57.0	60.1	61.0	41.3	30.6	34.2	50.7	51.2
1936	(1)	(1)	(1)	(1)	(1)	39.5	41.4	40.2	27.5	26.0	18.6	25.7	(1)
1937	31.0	35.7	36.7	37.9	37.5	38.2	40.6	23.6	40.0	78.2	(1)	(1)	(1)
1954	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	33.3	19.5	20.5	25.4	(1)
1955	30.2	29.6	30.7	29.0	30.1	29.3	29.3	37.0	49.7	25.2	29.9	29.2	31.6
1956	31.2	30.8	29.6	30.3	29.9	33.1	32.9	31.5	18.6	15.2	17.3	21.5	26.8
1957	25.5	33.3	30.9	28.9	29.7	26.8	28.6	30.4	37.6	26.8	18.3	31.8	29.0
1958	30.8	30.0	31.0	29.4	28.8	28.9	31.1	30.8	29.1	16.5	18.3	20.7	27.1
1959	22.1	28.0	28.8	30.5	28.6	29.3	29.2	22.9	15.4	10.8	7.78	14.4	22.3
1960	24.8	26.6	27.5	28.2	27.4	34.9	26.1	19.3	14.8	7.96	11.1	15.9	22.0
1961	18.9	20.8	25.1	25.2	25.5	25.5	24.0	10.9	6.29	8.60	8.82	16.0	17.9
1962	22.2	23.7	25.1	22.6	23.7	22.1	21.9	68.1	86.3	34.7	20.4	24.2	32.9
1963	25.8	27.9	29.5	29.1	30.3	29.9	52.3	68.6	60.0	21.5	18.1	20.0	34.4
1964	20.7	25.7	28.4	28.7	28.6	30.8	30.4	32.8	109	33.7	16.3	24.3	34.0
1965	22.7	27.7	31.4	29.7	30.5	29.4	42.3	132	55.1	30.1	29.3	28.2	40.8
1966	29.8	32.1	35.8	32.4	34.0	36.0	40.1	36.2	24.6	15.2	20.7	20.1	29.7
1967	28.1	31.1	33.1	31.7	30.9	31.1	33.9	52.2	52.0	24.3	20.8	26.8	33.0
1968	31.3	34.2	34.6	33.3	33.6	33.6	33.5	34.0	38.8	20.7	25.3	24.0	31.4
1969	24.4	30.6	31.1	33.4	32.7	35.7	44.8	74.9	41.1	20.1	14.0	14.8	33.1
1970	24.3	31.2	29.7	30.5	27.9	30.1	37.9	110	107	28.4	34.0	32.5	43.6
1971	33.7	36.5	34.4	32.4	57.8	46.2	60.9	97.9	66.5	33.5	20.2	35.4	46.1
1972	44.1	43.1	40.5	40.0	40.1	40.5	43.1	81.7	80.7	52.1	48.5	44.2	49.9
1973	45.0	44.6	42.7	43.0	44.7	43.0	56.0	113	92.5	37.6	58.9	50.4	56.0
1974	44.8	47.9	47.1	46.1	43.5	42.7	57.8	55.5	51.9	25.0	26.1	34.2	43.5
1975	34.6	40.1	40.1	41.1	41.4	40.9	45.6	60.0	53.1	21.4	22.5	26.3	38.9
1976	35.2	36.4	37.6	37.3	37.3	35.9	41.3	35.4	128	54.9	32.3	31.7	45.1
1977	38.8	41.3	39.6	38.6	38.6	39.5	51.5	56.9	35.4	22.5	23.0	31.7	38.1
1978	32.6	37.7	37.3	36.5	37.6	58.9	46.3	101	51.8	34.4	32.8	28.6	44.7
1979	30.0	39.8	38.5	38.0	40.1	41.0	41.1	39.6	23.1	22.3	28.2	30.1	34.3
1980	27.3	37.7	36.6	34.8	35.4	33.6	32.0	24.0	36.1	8.83	12.4	24.9	28.6
1981	18.7	27.3	29.2	29.8	27.5	29.1	18.8	17.6	23.5	12.0	12.9	16.5	21.9
1982	15.1	25.0	27.4	24.5	24.6	26.9	26.1	131	46.2	20.1	18.8	17.2	33.7
1983	31.9	35.6	34.3	34.7	32.7	35.1	47.8	72.5	44.6	18.9	18.3	25.0	35.9
1984	30.5	39.3	25.5	21.6	34.9	35.1	34.6	53.2	92.2	27.2	24.7	15.9	36.1
1985	30.7	34.3	34.2	31.5	29.1	32.0	34.0	7.44	13.1	12.3	6.78	11.8	23.1
1986	22.4	24.1	26.3	26.7	27.7	27.6	32.8	37.9	42.6	26.2	18.9	31.0	28.7
1987	33.8	32.0	32.3	31.8	32.5	43.0	40.7	41.5	31.5	19.7	26.0	34.7	33.3
1988	33.5	32.9	34.4	31.2	31.7	33.4	32.7	36.1	15.0	15.0	9.68	16.2	26.8
1989	20.6	27.9	28.7	29.1	27.0	30.1	28.3	32.8	23.3	8.30	17.3	13.5	23.9
1990	24.4	27.1	25.4	27.5	26.4	26.7	27.9	29.5	17.9	7.62	18.3	16.4	22.9
1991	14.2	30.5	22.8	21.9	25.3	26.9	27.8	28.9	31.5	8.16	9.72	26.4	22.8
1992	15.6	25.4	25.7	26.1	25.2	24.3	23.5	11.8	12.2	14.0	13.9	14.9	19.3
1993	21.7	22.3	21.5	20.7	21.2	23.6	24.3	22.9	32.1	27.0	22.8	23.9	23.7

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E34.2. Statistics on mean flow, in cubic feet per second, for station 06430500, Redwater Creek at Wyoming-South Dakota State line (October 1954 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	39	39	39	39	39	39	39	39	39	39	39	39	39
Maximum	45.0	47.9	47.1	46.1	57.8	58.9	60.9	132	128	54.9	58.9	50.4	56.0
Percentile													
75th	32.6	36.5	35.8	34.7	35.4	36.0	43.1	68.6	55.1	27.2	26.0	31.0	38.1
50th	28.1	31.1	31.0	30.5	30.3	32.0	33.5	37.0	38.8	21.4	18.9	24.3	32.9
25th	22.2	27.3	27.5	28.2	27.5	28.9	28.3	29.5	23.3	14.0	14.0	16.4	23.9
Minimum	14.2	20.8	21.5	20.7	21.2	22.1	18.8	7.44	6.29	7.62	6.78	11.8	17.9
Mean	28.00	32.11	31.91	31.23	32.17	33.40	36.24	50.76	45.90	22.28	21.37	24.75	32.48
Standard deviation	7.69	6.44	5.76	5.82	7.03	7.30	10.49	33.07	29.86	11.18	10.43	8.64	8.97
Skewness	0.39	0.49	0.50	0.47	1.47	1.23	0.63	1.06	1.07	1.00	1.59	0.78	0.58
Coefficient of variation	0.27	0.20	0.18	0.19	0.22	0.22	0.29	0.65	0.65	0.50	0.49	0.35	0.28
Percent of annual flow	7.18	8.23	8.18	8.00	8.25	8.56	9.29	13.01	11.77	5.71	5.48	6.34	[1]0.736

[1]Serial correlation for annual mean flows.

Table E34.3. Serial correlation for 1-year lag for monthly mean flow for station 06430500, Redwater Creek at Wyoming-South Dakota State line (October 1954 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.639	0.723	0.719	0.681	0.550	0.509	0.476	0.280	0.248	0.361	0.383	0.511

Table E34.4. Correlation matrix for monthly mean flow for station 06430500, Redwater Creek at Wyoming-South Dakota State line (October 1954 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.855	0.853	0.808	0.755	0.709	0.733	0.228	0.291	0.476	0.619	0.625
Nov.	*	1.000	0.875	0.824	0.807	0.744	0.727	0.268	0.292	0.372	0.541	0.578
Dec.	*	*	1.000	0.966	0.779	0.735	0.740	0.286	0.215	0.375	0.516	0.567
Jan.	*	*	*	1.000	0.742	0.724	0.732	0.255	0.191	0.335	0.509	0.555
Feb.	*	*	*	*	1.000	0.796	0.835	0.373	0.318	0.435	0.472	0.593
Mar.	*	*	*	*	*	1.000	0.741	0.365	0.194	0.347	0.467	0.477
Apr.	*	*	*	*	*	*	1.000	0.547	0.354	0.427	0.500	0.582
May	*	*	*	*	*	*	*	1.000	0.515	0.503	0.584	0.469
June	*	*	*	*	*	*	*	*	1.000	0.827	0.609	0.537
July	*	*	*	*	*	*	*	*	*	1.000	0.740	0.695
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.816
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E34.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06430500, Redwater Creek at Wyoming-South Dakota State line

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1955	14.0	33	15.3	33	17.6	33	18.6	33	24.5	34	27.2	34	27.9	32	28.8	31	29.3	27
1956	8.00	25	8.00	22	8.71	21	9.79	17	13.9	14	15.4	14	16.8	13	17.9	13	21.5	12
1957	6.00	18	7.00	19	9.14	22	10.3	21	15.1	20	21.2	24	24.9	29	26.0	26	27.6	23
1958	6.00	19	6.00	18	6.43	15	11.2	24	15.7	21	17.0	15	18.2	15	19.0	14	22.2	14
1959	2.50	5	2.60	3	3.61	4	5.16	5	6.45	5	7.92	2	9.96	3	11.6	3	15.9	6
1960	3.40	11	3.90	8	4.30	6	5.86	8	6.48	6	9.31	5	10.9	4	11.7	4	14.3	3
1961	3.30	10	3.30	5	4.63	8	5.91	9	6.13	3	7.45	1	7.41	1	7.91	1	12.1	1
1962	6.00	20	8.00	23	9.57	25	10.5	22	14.9	18	22.1	28	23.2	24	24.4	22	26.1	20
1963	7.20	23	8.13	25	11.1	27	13.0	27	15.0	19	18.1	18	18.2	16	19.6	15	22.3	15
1964	11.0	29	11.7	29	11.7	29	12.4	25	15.9	22	20.1	22	21.0	20	22.0	18	25.1	17
1965	17.0	34	17.3	34	18.1	34	19.6	34	23.5	33	25.7	32	27.5	31	28.1	30	30.4	30
1966	6.60	22	7.40	21	7.99	20	8.82	15	14.2	15	17.7	17	18.5	17	20.1	16	23.1	16
1967	5.00	15	5.20	14	6.59	16	9.06	16	16.6	23	18.3	19	22.7	22	24.9	23	28.2	25
1968	4.70	13	5.40	15	6.01	14	7.32	12	19.3	27	21.5	26	22.6	21	23.0	21	25.8	19
1969	6.20	21	7.13	20	7.77	19	10.2	20	11.2	12	14.0	12	14.3	11	17.8	12	22.1	13
1970	10.0	28	10.3	28	11.4	28	14.8	28	23.0	32	28.3	35	30.1	34	31.2	33	32.3	32
1971	11.0	30	12.0	30	13.7	30	16.6	32	19.4	28	21.6	27	27.9	33	31.8	35	35.1	35
1972	32.0	38	32.7	38	36.6	38	39.3	38	41.8	38	42.3	38	43.2	37	43.2	37	43.7	37
1973	18.0	35	19.3	35	23.1	36	26.6	37	30.2	37	40.6	37	44.1	38	44.8	38	45.4	38
1974	13.0	31	13.3	31	14.3	31	16.1	30	20.5	31	23.3	31	27.0	30	29.4	32	33.1	33
1975	7.60	24	8.07	24	9.37	23	10.7	23	17.2	24	19.6	21	22.7	23	25.9	25	29.8	29
1976	22.0	37	22.0	37	23.4	37	25.9	36	27.2	36	31.7	36	33.7	36	35.8	36	37.0	36
1977	9.60	27	9.77	27	11.0	26	15.4	29	19.4	29	22.3	29	24.6	27	26.9	27	30.4	31
1978	20.0	36	21.3	36	22.4	35	23.4	35	26.4	35	27.1	33	30.2	35	31.2	34	33.9	34
1979	5.40	17	5.67	17	6.70	17	8.04	14	19.7	30	22.4	30	24.2	25	25.8	24	28.1	24
1980	2.00	4	2.13	2	2.29	2	2.83	2	7.99	10	10.4	6	15.0	12	16.0	11	20.1	11
1981	3.10	7	3.20	4	3.26	3	5.61	6	11.0	11	12.3	10	13.8	9	14.0	8	15.6	5
1982	2.90	6	4.27	11	5.74	11	7.46	13	12.4	13	15.0	13	17.4	14	21.6	17	26.1	21
1983	1.40	2	3.53	7	6.70	18	9.90	19	14.7	16	17.0	16	19.8	18	22.3	19	25.5	18
1984	5.10	16	5.47	16	5.77	12	9.79	18	14.8	17	18.5	20	20.3	19	22.9	20	26.8	22
1985	1.30	1	1.40	1	1.89	1	2.19	1	3.08	1	8.00	3	9.55	2	9.08	2	12.1	2
1986	13.0	32	13.7	32	15.1	32	16.1	31	17.7	25	20.2	23	24.6	28	26.9	28	28.7	26
1987	8.30	26	9.00	26	9.44	24	12.9	26	18.2	26	21.4	25	24.4	26	27.2	29	29.3	28
1988	4.00	12	4.53	12	5.83	13	6.39	11	6.97	7	11.0	8	12.1	5	13.5	7	16.9	7
1989	1.90	3	4.13	10	5.04	10	5.81	7	7.25	8	12.7	11	12.7	7	15.2	10	18.9	10
1990	3.20	9	4.07	9	4.34	7	4.64	4	6.30	4	10.7	7	13.6	8	13.0	6	17.2	8
1991	3.10	8	3.33	6	3.99	5	4.38	3	5.32	2	8.59	4	13.9	10	14.6	9	18.4	9
1992	4.70	14	4.77	13	4.87	9	6.13	10	7.97	9	11.0	9	12.4	6	12.6	5	14.7	4

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E34.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06430500, Redwater Creek at Wyoming-South Dakota State line

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1955	170	15	137	14	94.7	15	65.7	18	50.9	19	43.5	19	38.8	21	36.4	22	34.0	24
1956	38.0	31	35.3	32	34.7	32	34.0	32	33.4	31	33.2	29	32.7	29	31.9	28	31.3	28
1957	48.0	29	47.0	29	43.9	28	40.9	28	39.3	26	35.3	27	33.3	28	31.8	29	30.8	29
1958	43.0	30	34.0	34	33.6	34	33.4	33	31.3	34	31.0	31	30.7	30	30.3	30	30.1	30
1959	33.0	36	32.3	36	31.9	36	31.4	35	30.7	35	29.7	35	29.8	33	29.5	33	29.3	32
1960	143	17	92.3	20	58.6	22	43.6	25	35.3	28	31.3	30	30.3	32	29.6	32	28.5	33
1961	28.0	38	27.7	38	27.3	38	26.8	38	26.1	38	25.9	38	25.6	39	25.5	39	24.4	39
1962	704	3	334	5	214	5	142	7	128	5	85.3	7	66.1	9	54.3	10	43.0	17
1963	220	12	183	11	144	11	112	11	81.1	13	70.8	12	60.8	11	53.1	11	45.0	12
1964	448	8	318	6	195	6	159	4	114	7	73.0	11	59.1	12	52.1	13	44.3	14
1965	706	2	459	2	289	3	211	3	145	1	95.4	3	77.7	3	66.9	4	54.1	7
1966	55.0	27	48.0	28	42.7	29	42.5	26	40.9	23	39.3	23	37.7	23	36.8	21	36.0	21
1967	112	20	98.7	18	82.0	17	67.3	17	53.5	18	52.9	18	47.3	18	43.3	18	39.1	19
1968	75.0	25	62.3	25	51.1	27	42.3	27	39.4	25	36.6	26	35.5	25	35.1	25	34.5	23
1969	268	9	212	10	160	10	113	10	81.4	12	60.5	14	54.1	15	49.6	16	44.0	16
1970	498	5	380	4	225	4	149	5	125	6	110	1	87.3	2	73.7	2	58.9	3
1971	224	11	180	12	134	12	107	12	99.2	9	86.0	6	76.9	4	69.9	3	61.7	2
1972	178	14	145	13	116	14	95.9	13	85.3	11	82.3	8	72.2	6	66.1	5	58.4	4
1973	490	7	239	8	189	7	144	6	130	4	105	2	89.1	1	77.7	1	68.0	1
1974	93.0	23	82.3	21	73.4	19	68.8	16	62.6	15	58.2	15	55.4	14	52.2	12	49.6	8
1975	105	22	95.0	19	82.4	16	69.1	15	62.1	16	56.8	16	53.3	16	50.1	15	47.1	10
1976	732	1	546	1	366	1	217	2	141	2	92.0	5	73.2	5	65.0	7	55.2	6
1977	79.0	24	73.0	23	68.7	20	63.5	19	60.5	17	54.6	17	49.5	17	47.0	17	44.2	15
1978	264	10	218	9	161	9	135	8	107	8	80.1	9	71.1	7	65.4	6	55.6	5
1979	54.0	28	53.0	27	51.3	26	44.5	24	41.3	22	41.1	21	40.8	20	40.5	19	39.8	18
1980	166	16	106	17	67.9	21	49.1	21	37.9	27	37.6	24	36.9	24	36.4	23	35.4	22
1981	34.0	35	33.7	35	32.3	35	31.0	36	30.0	36	29.4	36	29.3	35	29.1	34	27.4	34
1982	543	4	421	3	357	2	241	1	141	3	92.3	4	69.9	8	59.4	8	47.5	9
1983	143	18	132	16	116	13	90.3	14	77.0	14	63.6	13	55.9	13	50.6	14	44.9	13
1984	497	6	263	7	177	8	133	9	94.5	10	73.3	10	62.1	10	55.3	9	47.1	11
1985	38.0	32	37.0	30	35.9	30	35.6	30	35.0	29	34.4	28	33.6	27	32.9	27	32.6	27
1986	108	21	68.3	24	55.9	23	46.8	22	43.5	21	41.0	22	38.8	22	36.1	24	33.2	26
1987	205	13	136	15	80.0	18	54.5	20	43.7	20	43.1	20	42.2	19	40.3	20	37.5	20
1988	60.0	26	57.7	26	54.4	24	46.3	23	40.0	24	36.7	25	35.3	26	34.4	26	34.0	25
1989	37.0	33	36.3	31	35.0	31	34.4	31	33.4	32	30.7	32	30.6	31	29.7	31	29.4	31
1990	32.0	37	31.7	37	30.3	37	29.9	37	29.7	37	28.8	37	28.1	36	27.7	36	27.3	35
1991	35.0	34	34.7	33	34.3	33	33.3	34	32.3	33	30.2	33	29.4	34	28.8	35	27.0	36
1992	28.0	39	26.7	39	26.4	39	26.3	39	26.1	39	25.9	39	25.8	38	25.6	38	25.1	38
1993	138	19	80.7	22	52.7	25	39.3	29	35.0	30	30.1	34	27.7	37	26.7	37	25.5	37

Table E35.1. Mean flow, in cubic feet per second, for station 06431500, Spearfish Creek at Spearfish

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1947	44.1	42.0	42.5	40.6	41.7	43.8	75.0	73.9	119	64.4	50.8	44.5	56.8
1948	50.4	50.6	48.8	48.6	44.3	44.8	61.7	62.5	60.4	48.2	43.7	41.6	50.5
1949	45.2	45.3	37.5	33.9	35.7	41.4	67.2	82.5	55.2	42.4	38.3	43.0	47.3
1950	40.5	39.4	36.9	34.5	34.5	35.5	59.7	68.9	47.8	41.7	37.1	37.3	42.9
1951	39.0	38.4	33.3	35.8	31.1	33.9	38.6	47.2	47.9	36.0	33.8	34.8	37.5
1952	40.0	36.6	33.4	32.0	34.3	36.1	76.9	112	58.1	41.8	41.2	35.0	48.1
1953	34.7	31.2	32.5	32.2	33.9	36.1	43.2	109	71.8	48.5	42.6	37.2	46.2
1954	37.6	38.0	36.5	37.3	35.8	35.4	50.9	48.5	54.4	37.6	32.8	30.7	39.6
1955	34.5	35.9	32.7	33.5	36.0	35.1	62.7	72.2	81.5	44.6	40.2	37.5	45.5
1956	36.7	34.3	35.1	33.5	33.9	38.0	43.3	51.2	44.9	36.0	35.4	35.9	38.2
1957	33.6	32.6	33.0	30.1	29.0	30.1	49.4	75.8	61.2	42.7	36.0	35.2	40.8
1958	36.7	36.4	34.8	33.7	34.7	33.1	48.2	59.5	44.7	45.1	32.1	31.6	39.3
1959	33.5	33.8	31.8	30.7	32.8	33.5	42.9	46.9	41.4	30.6	28.4	28.7	34.6
1960	31.8	30.6	28.5	28.5	27.7	30.4	44.9	40.0	34.0	26.5	27.9	24.5	31.3
1961	25.8	27.8	29.0	26.5	26.8	28.3	31.1	28.9	29.1	24.6	23.6	24.1	27.1
1962	25.1	24.4	24.6	22.7	26.5	25.2	36.3	107	81.1	40.8	30.1	26.2	39.2
1963	31.8	30.2	24.8	25.9	30.4	36.8	109	105	111	57.5	40.3	41.8	53.7
1964	38.2	35.4	36.7	39.5	38.4	37.6	60.7	88.6	172	69.9	59.1	50.4	60.5
1965	50.3	49.6	49.0	49.0	48.7	44.1	77.3	284	107	65.9	60.8	64.4	79.5
1966	62.7	65.0	61.1	54.9	54.9	58.3	71.5	72.1	55.5	49.7	45.7	48.2	58.3
1967	46.2	48.2	46.0	48.0	44.2	48.0	66.8	83.6	84.1	58.2	49.9	52.7	56.3
1968	50.0	44.4	43.8	40.1	47.6	51.7	49.0	67.8	67.1	56.8	49.9	38.6	50.6
1969	38.5	49.2	33.7	29.4	41.4	42.8	74.2	114	66.5	59.8	36.9	42.7	52.4
1970	42.7	43.1	40.5	43.5	51.1	39.5	62.1	189	156	69.5	57.7	46.0	70.1
1971	45.5	45.9	41.0	42.9	56.5	51.4	101	141	67.5	60.3	48.9	54.5	63.1
1972	61.5	61.3	58.3	60.1	56.9	68.8	75.4	114	99.1	70.2	71.2	63.6	71.8
1973	59.7	59.5	54.6	59.3	61.8	56.5	70.9	161	128	68.0	55.4	60.6	74.6
1974	58.5	60.1	60.9	57.4	49.7	56.2	71.9	72.3	61.9	56.9	55.9	48.0	59.2
1975	50.4	50.5	44.5	42.8	35.2	47.3	63.9	105	79.1	47.9	44.6	44.1	54.8
1976	41.3	43.2	45.2	40.6	41.2	43.9	73.5	68.0	185	66.3	52.1	48.5	62.2
1977	45.5	46.9	45.1	45.9	40.3	43.1	89.7	106	63.4	54.5	50.6	55.3	57.3
1978	53.2	53.2	51.9	46.6	57.6	53.1	72.8	145	71.0	62.6	54.7	52.6	64.6
1979	55.7	56.1	51.5	50.6	64.3	52.4	55.6	60.5	64.8	53.8	52.3	47.9	55.4
1980	54.5	50.0	48.5	46.3	44.8	44.3	54.4	55.5	47.4	42.3	44.5	41.1	47.8
1981	41.0	39.3	41.1	39.3	37.1	40.5	42.3	46.0	67.5	40.2	33.3	32.6	41.7
1982	35.6	35.2	24.1	28.8	29.1	36.0	47.6	505	124	54.4	46.8	39.7	84.5
1983	53.5	46.2	41.7	33.8	33.5	58.1	88.3	180	91.5	58.0	48.7	45.8	65.1
1984	63.3	53.6	41.2	56.4	49.6	57.8	69.9	106	142	67.8	60.3	46.5	67.8
1985	47.8	53.9	48.9	46.0	40.0	49.4	55.2	50.0	47.4	40.7	38.5	41.4	46.6
1986	42.2	43.5	45.3	44.0	44.0	46.6	72.6	75.0	56.0	39.8	34.6	38.1	48.5
1987	39.6	41.1	37.6	36.9	35.6	39.6	64.1	49.1	38.6	32.2	29.9	30.6	39.6
1988	34.1	39.0	37.3	33.9	34.1	35.5	51.0	74.4	39.5	38.0	33.6	36.2	40.6
1989	40.0	39.9	38.4	33.5	32.6	37.4	43.0	72.5	44.6	38.4	39.2	39.3	41.6
1990	37.2	37.7	35.8	35.9	36.5	39.1	56.8	69.3	45.9	35.2	35.2	36.5	41.8
1991	34.6	36.5	30.0	30.8	34.3	35.8	43.6	70.8	63.3	41.0	33.0	34.3	40.7
1992	39.1	40.8	39.6	38.5	39.2	39.0	45.5	48.7	37.8	35.2	32.9	31.2	39.0
1993	32.1	31.2	32.7	31.4	31.4	36.5	52.1	71.0	74.7	50.1	42.9	43.8	44.2

Table E35.2. Statistics on mean flow, in cubic feet per second, for station 06431500, Spearfish Creek at Spearfish (October 1946 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	47	47	47	47	47	47	47	47	47	47	47	47	47
Maximum	63.3	65.0	61.1	60.1	64.3	68.8	109	505	185	70.2	71.2	64.4	84.5
Percentile													
75th	50.3	49.6	45.3	46.0	44.8	48.0	72.6	107	84.1	58.2	50.6	47.9	59.2
50th	40.5	41.1	38.4	37.3	36.5	39.6	60.7	72.5	63.4	47.9	41.2	41.1	48.1
25th	35.6	35.9	33.3	32.2	33.9	35.8	47.6	59.5	47.4	39.8	33.8	35.0	40.7
Minimum	25.1	24.4	24.1	22.7	26.5	25.2	31.1	28.9	29.1	24.6	23.6	24.1	27.1
Mean	42.88	42.70	40.04	39.28	40.01	42.29	60.93	96.51	74.29	48.78	42.84	41.38	51.04
Standard deviation	9.56	9.41	9.07	9.28	9.52	9.22	16.79	76.38	36.59	12.47	10.48	9.53	12.89
Skewness	0.49	0.42	0.48	0.57	0.86	0.70	0.67	3.81	1.42	0.15	0.48	0.47	0.63
Coefficient of variation	0.22	0.22	0.23	0.24	0.24	0.22	0.28	0.79	0.49	0.26	0.24	0.23	0.25
Percent of annual flow	7.01	6.98	6.54	6.42	6.54	6.91	9.96	15.77	12.14	7.97	7.00	6.76	[1]0.641

[1]Serial correlation for annual mean flows.

Table E35.3. Serial correlation for 1-year lag for monthly mean flow for station 06431500, Spearfish Creek at Spearfish (October 1946 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.688	0.730	0.637	0.653	0.693	0.704	0.228	0.136	0.260	0.668	0.608	0.740

Table E35.4. Correlation matrix for monthly mean flow for station 06431500, Spearfish Creek at Spearfish (October 1946 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.944	0.887	0.908	0.816	0.926	0.449	0.107	0.223	0.561	0.724	0.707
Nov.	*	1.000	0.922	0.902	0.836	0.900	0.447	0.075	0.141	0.512	0.642	0.711
Dec.	*	*	1.000	0.924	0.822	0.843	0.364	-0.073	0.110	0.455	0.630	0.681
Jan.	*	*	*	1.000	0.863	0.845	0.374	0.027	0.264	0.551	0.728	0.730
Feb.	*	*	*	*	1.000	0.809	0.440	0.095	0.280	0.634	0.715	0.735
Mar.	*	*	*	*	*	1.000	0.547	0.120	0.261	0.619	0.735	0.742
Apr.	*	*	*	*	*	*	1.000	0.226	0.378	0.617	0.542	0.666
May	*	*	*	*	*	*	*	1.000	0.451	0.444	0.405	0.375
June	*	*	*	*	*	*	*	*	1.000	0.813	0.690	0.539
July	*	*	*	*	*	*	*	*	*	1.000	0.911	0.842
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.894
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E35.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06431500, Spearfish Creek at Spearfish

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1947	20.0	13	26.0	19	33.1	32	39.3	37	42.6	37	44.0	36	45.7	38	46.5	38	47.5	37
1948	25.0	18	25.0	14	25.3	9	28.1	10	32.1	16	33.6	20	35.1	20	37.1	23	39.5	25
1949	30.0	35	31.0	30	32.3	29	33.1	27	33.5	22	34.3	22	34.9	19	35.3	17	37.0	19
1950	25.0	19	25.3	16	28.0	15	29.4	15	30.6	13	31.7	13	32.8	13	33.5	13	35.3	16
1951	28.0	28	29.3	27	30.0	20	30.9	17	31.7	15	32.4	15	33.1	14	33.7	14	35.0	14
1952	25.0	20	25.7	17	29.1	18	30.3	16	31.2	14	31.7	14	31.9	11	32.4	10	33.1	9
1953	25.0	21	28.0	24	30.7	25	33.6	29	35.1	27	35.1	23	36.2	23	36.2	19	36.8	18
1954	22.0	14	23.3	12	26.9	14	28.9	12	29.7	10	30.7	10	32.3	12	33.3	12	33.3	10
1955	25.0	22	26.3	20	30.4	21	32.1	22	32.5	20	33.5	18	33.7	17	33.7	15	34.9	13
1956	18.0	9	22.0	11	25.6	11	27.3	8	28.5	8	29.0	7	29.8	6	30.5	6	31.4	6
1957	26.0	24	27.0	21	29.7	19	31.3	18	32.5	21	33.3	17	33.6	16	34.0	16	35.0	15
1958	17.0	7	20.0	9	26.7	13	28.0	9	30.0	11	30.9	11	31.2	8	31.7	9	32.1	8
1959	9.00	1	19.0	6	24.1	8	26.5	7	26.7	6	27.1	5	28.1	5	28.1	4	29.3	4
1960	10.0	2	16.3	1	21.0	5	23.2	5	23.9	4	25.0	3	25.6	2	25.9	2	26.7	2
1961	19.0	11	19.7	8	20.4	4	21.3	3	22.5	1	23.4	1	23.9	1	24.0	1	24.0	1
1962	12.0	3	18.3	4	19.7	3	22.1	4	23.3	3	25.1	4	26.8	3	27.4	3	28.1	3
1963	31.0	39	32.3	34	32.7	31	33.4	28	34.1	24	35.2	24	36.5	25	37.3	24	37.6	22
1964	33.0	41	35.0	40	37.9	39	40.7	38	43.9	40	46.3	39	47.2	39	47.7	39	48.4	39
1965	44.0	46	48.3	46	50.4	46	52.6	46	53.4	45	54.5	45	55.7	45	57.2	45	59.4	46
1966	32.0	40	32.7	35	36.7	38	41.2	39	43.7	39	44.9	38	45.3	37	46.0	36	46.5	35
1967	30.0	36	31.7	32	32.3	30	35.9	33	39.7	35	41.4	32	42.0	32	43.8	34	46.0	34
1968	15.0	5	17.0	2	19.4	2	19.9	2	25.8	5	28.4	6	33.2	15	36.5	22	38.0	24
1969	25.0	23	27.7	23	30.4	22	33.0	26	35.9	28	39.6	30	40.5	29	41.2	29	41.4	27
1970	22.0	15	25.7	18	31.7	26	37.0	35	38.6	32	41.4	33	43.0	34	43.6	33	44.9	32
1971	28.0	29	36.0	41	44.9	41	45.6	41	48.0	42	51.5	43	53.5	43	55.7	43	57.2	43
1972	16.0	6	37.7	42	49.4	45	51.6	45	53.9	46	55.2	46	57.0	46	57.8	46	58.5	45
1973	38.0	43	45.0	44	47.6	44	49.1	44	49.8	43	52.7	44	54.4	44	56.2	44	57.2	44
1974	26.0	25	28.7	25	32.0	28	32.7	25	33.9	23	39.1	28	40.7	30	42.3	31	45.1	33
1975	30.0	37	34.0	37	36.0	36	36.7	34	39.2	33	40.8	31	41.8	31	42.2	30	42.4	30
1976	34.0	42	34.7	39	35.0	35	35.1	31	37.5	30	41.8	34	42.8	33	43.5	32	44.6	31
1977	41.0	44	45.0	45	45.0	43	45.7	42	46.4	41	48.9	41	50.5	41	50.8	41	51.8	41
1978	42.0	45	43.3	43	44.9	42	48.6	43	50.0	44	50.6	42	52.1	42	53.2	42	53.2	42
1979	30.0	38	34.3	38	40.1	40	43.0	40	43.5	38	44.5	37	45.1	36	45.8	35	48.1	38
1980	29.0	30	30.7	29	33.9	34	35.5	32	36.9	29	38.0	27	39.0	27	39.2	27	39.6	26
1981	12.0	4	17.0	3	18.3	1	19.0	1	22.6	2	24.9	2	27.0	4	29.2	5	30.9	5
1982	17.0	8	18.3	5	22.3	7	29.3	14	32.4	19	33.5	19	36.3	24	38.3	26	41.5	28
1983	19.0	12	20.3	10	25.4	10	31.6	19	40.4	36	47.1	40	48.7	40	49.8	40	51.4	40
1984	29.0	31	29.7	28	30.4	23	32.3	24	39.5	34	43.1	35	44.9	35	46.1	37	47.2	36
1985	29.0	32	31.7	33	36.6	37	38.0	36	38.3	31	39.3	29	40.0	28	40.6	28	41.8	29
1986	29.0	33	33.0	36	33.4	33	33.7	30	34.6	26	36.0	26	36.5	26	37.4	25	37.9	23
1987	22.0	16	25.0	15	26.6	12	28.4	11	29.5	9	30.2	9	30.5	7	31.4	7	33.7	12
1988	27.0	26	28.7	26	30.6	24	31.6	20	32.2	17	32.4	16	34.2	18	35.3	18	36.7	17
1989	27.0	27	27.3	22	29.0	17	32.1	23	34.4	25	35.4	25	35.8	22	36.4	20	37.0	20
1990	18.0	10	19.3	7	21.4	6	24.5	6	27.6	7	30.0	8	31.6	10	32.7	11	33.6	11
1991	29.0	34	31.0	31	31.7	27	31.8	21	32.2	18	33.6	21	35.1	21	36.4	21	37.5	21
1992	23.0	17	24.7	13	28.4	16	29.2	13	30.0	12	31.1	12	31.4	9	31.5	8	31.7	7

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E35.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06431500, Spearfish Creek at Spearfish

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1947	609	5	460	5	283	6	177	11	123	13	96.2	16	90.5	13	83.3	13	71.3	13
1948	106	24	97.3	33	86.4	32	75.3	35	70.4	33	62.4	34	61.7	29	58.8	29	53.9	28
1949	147	21	131	22	112	22	99.9	22	90.0	20	77.8	22	68.7	23	62.6	25	55.0	27
1950	106	25	104	24	96.6	27	83.4	30	70.0	34	65.9	30	59.1	32	54.8	32	48.8	33
1951	57.0	45	56.0	45	52.7	45	49.8	45	48.1	45	47.8	43	45.1	43	43.1	44	39.9	44
1952	521	7	407	7	255	10	166	13	114	18	100	13	83.3	17	73.0	18	61.1	20
1953	184	17	154	18	137	18	123	19	114	17	91.7	19	78.9	19	70.1	19	59.0	21
1954	76.0	40	75.0	39	71.4	40	64.1	39	59.6	40	53.6	40	51.5	41	48.1	40	43.8	41
1955	164	18	139	20	119	21	101	21	86.7	21	82.6	21	73.7	21	65.8	22	56.4	24
1956	94.0	35	90.0	35	78.4	36	62.9	41	54.9	42	49.6	42	47.5	42	45.1	42	41.7	43
1957	98.0	33	94.0	34	86.4	33	80.8	31	76.1	28	68.9	27	64.5	27	57.9	30	50.1	30
1958	103	27	100	28	92.3	31	76.5	32	65.9	37	54.9	39	52.6	38	49.6	39	44.4	39
1959	67.0	42	64.0	42	58.6	44	52.7	44	48.2	44	46.1	45	43.9	45	41.3	45	38.2	45
1960	55.0	46	53.0	46	51.0	46	49.5	46	46.1	46	43.0	46	40.3	46	37.7	46	34.3	46
1961	52.0	47	45.0	47	39.7	47	33.9	47	32.3	47	30.7	47	30.4	47	29.6	47	28.8	47
1962	558	6	439	6	299	5	197	7	140	12	99.0	15	78.2	20	67.6	20	53.7	29
1963	438	9	376	9	271	9	190	9	140	11	120	10	109	8	97.0	8	78.0	11
1964	1,480	3	742	4	402	4	258	4	179	7	131	6	114	6	99.2	6	83.3	8
1965	1,880	1	1320	1	763	2	463	2	298	2	202	2	160	2	136	2	110	2
1966	108	23	107	23	98.4	25	92.1	25	84.3	25	73.4	25	67.8	25	64.7	23	63.1	18
1967	190	16	148	19	126	20	106	20	85.5	23	84.7	20	79.3	18	73.7	17	66.3	16
1968	102	29	98.7	30	83.4	35	70.2	37	68.3	35	67.4	29	63.8	28	61.9	27	58.0	23
1969	338	11	286	11	209	12	156	15	116	15	95.2	17	86.0	15	79.2	14	66.6	15
1970	510	8	396	8	278	7	247	5	197	3	176	3	141	3	122	3	96.8	3
1971	220	14	197	15	173	15	157	14	146	9	126	8	106	10	93.5	10	80.0	10
1972	160	20	156	17	144	17	126	17	116	16	107	12	98.2	11	91.8	11	83.8	7
1973	273	12	255	12	242	11	194	8	180	6	147	5	124	4	108	4	91.2	4
1974	102	30	102	26	101	23	95.1	24	85.5	24	74.7	23	69.3	22	66.2	21	62.6	19
1975	143	22	137	21	135	19	124	18	108	19	94.7	18	83.9	16	75.5	16	65.0	17
1976	1,500	2	790	3	508	3	306	3	193	4	128	7	111	7	98.7	7	81.8	9
1977	162	19	161	16	151	16	132	16	117	14	100	14	86.9	14	78.9	15	69.9	14
1978	219	15	208	14	186	14	174	12	152	8	115	11	97.9	12	88.5	12	77.2	12
1979	79.0	39	74.3	40	73.3	39	70.2	38	65.6	38	62.8	33	61.3	30	59.2	28	58.4	22
1980	76.0	41	74.3	41	70.1	41	64.0	40	61.2	39	56.5	38	52.8	37	50.6	37	49.3	31
1981	88.0	36	86.7	36	84.4	34	75.4	34	71.9	31	59.6	36	54.1	35	50.8	35	46.5	36
1982	1,430	4	1,273	2	1,076	1	935	1	585	1	323	1	233	1	187	1	137	1
1983	356	10	333	10	272	8	216	6	188	5	148	4	122	5	107	5	87.6	5
1984	233	13	215	13	194	13	180	10	142	10	125	9	107	9	96.9	9	83.9	6
1985	64.0	43	63.0	44	61.9	42	59.4	42	55.2	41	52.6	41	51.6	39	50.7	36	49.0	32
1986	104	26	102	25	99.9	24	95.2	23	86.5	22	74.2	24	68.5	24	62.9	24	56.4	25
1987	84.0	37	79.7	38	75.4	38	73.9	36	66.4	36	56.7	37	51.6	40	48.0	41	44.1	40
1988	98.0	34	97.7	32	96.7	26	89.5	26	75.5	29	63.4	32	55.5	34	51.5	34	45.6	38
1989	100	31	98.3	31	92.6	29	84.5	29	74.2	30	60.6	35	53.8	36	50.1	38	46.3	37
1990	82.0	38	81.0	37	77.6	37	76.2	33	71.1	32	63.5	31	57.8	33	53.1	33	47.3	35
1991	103	28	101	27	92.4	30	88.1	28	84.3	26	68.0	28	59.8	31	55.0	31	48.2	34
1992	64.0	44	64.0	43	61.0	43	57.1	43	52.6	43	47.3	44	44.5	44	43.2	43	41.8	42
1993	100	32	100	29	96.0	28	88.4	27	76.3	27	73.2	26	67.4	26	62.3	26	55.7	26

Table E36.1. Mean flow, in cubic feet per second, for station 06433000, Redwater River above Belle Fourche

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	[1]102	107	97.9	125	128	140	159	507	834	263	73.9	192	[2]227
1947	217	209	205	207	219	232	260	233	439	209	87.8	106	218
1948	152	180	193	190	187	184	174	163	126	111	72.4	41.9	148
1949	99.0	148	135	92.3	136	273	237	251	99.9	18.5	13.5	88.6	132
1950	121	127	145	132	149	151	200	200	48.9	10.9	28.6	64.0	115
1951	127	110	137	129	124	119	123	54.6	101	41.0	33.1	108	100
1952	116	115	113	111	151	167	167	180	48.7	36.0	21.5	38.5	105
1953	77.4	95.3	125	129	130	120	127	268	176	26.2	75.4	55.5	117
1954	72.6	109	141	129	131	126	142	106	124	19.3	6.02	20.3	93.5
1955	67.3	102	123	123	119	122	160	156	151	24.6	25.4	60.3	103
1956	103	110	129	122	130	126	125	102	33.1	9.16	6.39	42.9	86.4
1957	73.4	120	127	83.5	121	114	132	150	150	63.9	21.1	90.9	104
1958	93.0	101	121	115	111	115	145	107	87.9	40.2	15.9	29.5	89.9
1959	60.3	94.6	112	108	117	120	116	57.9	18.7	4.87	2.72	19.3	69.0
1960	83.7	102	109	97.7	105	136	117	35.1	30.1	2.13	9.13	26.4	71.0
1961	50.6	82.7	102	107	112	105	66.0	20.7	7.93	5.50	2.88	26.0	57.1
1962	63.4	84.1	69.9	98.2	110	112	105	291	437	171	31.8	58.6	136
1963	105	97.2	96.0	87.7	158	139	250	285	261	41.8	17.7	99.9	136
1964	88.9	104	92.0	104	105	140	158	150	484	91.7	43.7	95.8	138
1965	105	116	119	134	145	133	180	716	279	117	58.7	147	188
1966	158	160	175	167	157	190	207	170	43.6	25.5	63.7	78.7	133
1967	135	151	146	145	150	152	175	240	195	48.2	20.5	99.4	138
1968	141	162	145	142	147	147	149	107	132	40.0	32.7	105	120
1969	102	149	144	139	140	171	214	316	128	31.3	7.05	40.6	132
1970	118	153	148	124	134	150	217	492	382	35.1	54.6	110	176
1971	156	180	170	159	207	188	235	314	247	57.3	33.1	141	173
1972	196	198	166	165	195	173	190	315	318	148	135	151	196
1973	169	187	183	163	174	187	277	467	312	91.2	115	172	208
1974	187	190	186	156	173	176	237	181	104	19.5	57.7	124	149
1975	124	169	158	151	146	165	214	279	171	37.7	14.3	78.6	142
1976	121	151	162	155	152	143	170	128	739	180	69.5	95.6	188
1977	149	152	150	147	151	156	241	221	75.1	27.1	63.6	127	138
1978	183	163	148	126	140	232	228	459	177	78.7	40.9	104	174
1979	154	173	156	129	138	210	180	124	62.5	48.5	110	77.1	130
1980	110	150	150	137	145	147	130	55.3	76.3	3.48	7.62	74.7	98.5
1981	108	138	136	128	124	111	62.9	52.7	88.9	21.4	50.8	72.6	90.9
1982	124	130	120	104	102	118	132	966	289	64.1	31.1	99.0	191
1983	283	183	155	155	173	206	263	402	174	34.0	50.8	117	183
1984	162	156	122	163	169	153	188	285	504	71.4	50.5	89.6	176
1985	159	144	146	125	132	154	140	33.4	24.3	7.45	19.7	68.5	95.8
1986	139	109	123	144	142	130	194	193	130	24.1	22.2	112	122
1987	149	169	150	128	124	147	187	162	78.6	11.7	57.7	108	123
1988	126	153	135	115	126	151	142	128	4.07	5.39	7.92	35.3	93.9
1989	123	135	121	101	101	128	138	172	47.9	6.91	8.16	61.0	95.1
1990	133	124	109	112	118	125	134	164	56.8	5.15	9.73	29.0	93.3
1991	98.1	132	116	104	111	126	128	111	117	6.36	3.52	53.4	91.8
1992	100	126	115	115	110	108	121	20.0	23.9	31.6	17.6	63.8	79.1
1993	120	136	129	96.2	91.7	156	143	186	203	132	55.0	77.4	127

[1]Unpublished value, calculated from published estimate of annual flow.

[2]Estimated value.

Table E36.2. Statistics on mean flow, in cubic feet per second, for station 06433000, Redwater River above Belle Fourche (October 1946 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	47	47	47	47	47	47	47	47	47	47	47	47	47
Maximum	283	209	205	207	219	273	277	966	739	209	135	172	218
Percentile													
75th	152	162	150	147	151	171	214	285	247	64.1	57.7	106	149
50th	121	138	136	128	136	147	167	172	126	34.0	31.1	78.6	127
25th	99.0	110	120	108	118	125	132	107	56.8	11.7	13.5	53.4	95.1
Minimum	50.6	82.7	69.9	83.5	91.7	105	62.9	20.0	4.07	2.13	2.72	19.3	57.1
Mean	125.59	138.93	137.40	129.67	138.99	151.79	170.66	218.50	170.37	49.72	37.95	80.53	129.03
Standard deviation	43.89	32.10	27.09	26.59	28.21	36.37	51.11	177.99	155.67	50.60	31.46	37.32	39.85
Skewness	1.06	0.17	0.23	0.61	0.84	1.27	0.18	2.19	1.63	1.59	1.19	0.25	0.44
Coefficient of variation	0.35	0.23	0.20	0.21	0.20	0.24	0.30	0.81	0.91	1.02	0.83	0.46	0.31
Percent of annual flow	8.10	8.96	8.86	8.37	8.97	9.79	11.01	14.10	10.99	3.21	2.45	5.19	[1]0.598

[1]Serial correlation for annual mean flows.

Table E36.3. Serial correlation for 1-year lag for monthly mean flow for station 06433000, Redwater River above Belle Fourche (October 1946 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.541	0.788	0.703	0.551	0.553	0.415	0.441	0.123	0.103	0.178	0.273	0.504

Table E36.4. Correlation matrix for monthly mean flow for station 06433000, Redwater River above Belle Fourche (October 1946 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.821	0.676	0.664	0.676	0.632	0.652	0.260	0.151	0.244	0.540	0.574
Nov.	*	1.000	0.867	0.722	0.713	0.710	0.636	0.202	0.181	0.287	0.586	0.553
Dec.	*	*	1.000	0.822	0.739	0.619	0.578	0.072	0.072	0.226	0.560	0.433
Jan.	*	*	*	1.000	0.832	0.442	0.510	0.102	0.278	0.373	0.578	0.411
Feb.	*	*	*	*	1.000	0.602	0.698	0.180	0.298	0.375	0.532	0.526
Mar.	*	*	*	*	*	1.000	0.742	0.206	0.099	0.235	0.401	0.369
Apr.	*	*	*	*	*	*	1.000	0.414	0.279	0.225	0.420	0.626
May	*	*	*	*	*	*	*	1.000	0.403	0.317	0.284	0.511
June	*	*	*	*	*	*	*	*	1.000	0.778	0.434	0.451
July	*	*	*	*	*	*	*	*	*	1.000	0.586	0.397
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.617
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E36.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06433000, Redwater River above Belle Fourche

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1947	58.0	44	59.3	44	62.1	44	64.7	44	77.4	44	88.7	44	107	44	120	44	145	44
1948	12.0	39	15.0	39	18.3	40	21.8	40	30.8	38	56.0	40	67.7	39	79.0	35	97.7	32
1949	4.60	30	4.80	29	5.24	27	5.36	19	10.5	21	15.4	14	32.1	17	49.0	18	76.6	20
1950	3.00	20	3.17	19	3.93	18	4.39	14	6.07	12	14.0	13	19.9	11	36.1	15	64.7	16
1951	4.30	29	4.30	27	4.84	26	5.96	23	11.6	23	34.4	28	51.1	26	54.2	21	74.2	19
1952	3.00	21	3.27	21	4.83	25	5.60	21	9.46	18	23.1	19	25.4	15	30.4	12	52.0	9
1953	3.00	22	3.00	17	3.00	12	5.24	18	19.8	32	46.8	37	50.9	25	56.2	22	79.2	22
1954	1.80	11	2.07	11	2.31	8	2.53	7	3.89	7	5.15	6	12.8	6	26.5	9	54.3	11
1955	3.40	26	3.77	24	4.50	22	6.32	24	23.3	34	24.5	22	34.0	18	49.5	19	69.5	17
1956	3.30	25	3.43	23	4.14	20	4.35	13	4.58	8	7.50	10	13.7	8	21.4	7	43.3	4
1957	2.90	18	3.40	22	4.40	21	4.87	17	10.3	20	36.2	30	54.0	29	64.4	26	80.9	25
1958	5.00	32	5.67	33	5.86	30	6.36	25	8.03	15	17.4	16	26.5	16	35.0	14	49.4	8
1959	1.80	12	1.93	10	2.07	7	2.34	6	2.67	4	3.44	1	4.33	1	8.85	2	29.6	3
1960	.20	4	.50	4	.56	1	.72	1	1.10	1	5.53	7	8.41	4	13.1	4	25.2	2
1961	1.00	9	1.10	6	1.26	4	1.50	3	2.15	2	3.58	2	4.66	2	5.34	1	20.7	1
1962	5.00	33	5.67	34	6.57	33	7.64	29	17.6	30	44.2	35	64.4	35	72.5	32	79.3	23
1963	5.00	34	5.27	31	5.49	28	7.67	30	14.0	24	26.4	23	50.8	24	60.4	23	73.4	18
1964	2.90	19	3.90	25	4.51	23	4.76	16	9.58	19	47.8	38	66.0	38	75.8	34	90.6	29
1965	20.0	42	23.3	42	27.9	42	36.2	42	40.3	42	72.6	42	103	43	116	43	135	42
1966	3.20	24	4.00	26	4.59	24	5.43	20	9.02	17	26.8	24	40.2	19	50.7	20	79.7	24
1967	2.80	17	3.20	20	3.70	17	5.75	22	17.2	29	23.1	20	52.8	28	75.1	33	102	34
1968	.25	5	1.22	8	2.66	10	7.33	28	16.0	27	30.1	25	56.0	30	67.7	27	84.5	26
1969	.57	6	1.06	5	1.65	6	2.86	9	5.79	11	10.4	12	23.2	13	46.3	16	78.8	21
1970	3.90	28	4.30	28	5.50	29	19.0	37	26.5	36	43.1	34	62.8	34	85.1	37	116	38
1971	6.70	35	7.30	35	9.34	36	17.1	35	23.2	33	37.4	31	74.5	41	103	41	131	41
1972	73.0	46	76.7	46	94.6	46	105	46	117	46	129	46	140	46	147	46	158	46
1973	68.0	45	69.7	45	70.7	45	72.1	45	80.3	45	98.2	45	124	45	137	45	156	45
1974	7.40	37	7.60	36	8.70	35	10.8	31	15.1	25	33.5	26	56.8	31	71.3	30	98.2	33
1975	2.00	13	2.33	12	3.51	16	6.86	27	8.79	16	17.6	17	41.4	20	60.5	24	92.9	30
1976	30.0	43	32.7	43	41.1	43	45.7	43	63.9	43	80.1	43	97.6	42	112	42	124	40
1977	1.10	10	2.53	14	4.00	19	17.2	36	26.0	35	38.7	32	52.5	27	69.5	29	104	35
1978	11.0	38	14.3	38	18.0	39	19.6	38	37.2	40	56.1	41	70.1	40	86.9	38	116	39
1979	6.90	36	9.20	37	11.2	37	14.6	34	40.2	41	54.5	39	65.5	36	72.4	31	87.4	27
1980	.12	3	.29	2	1.05	3	1.72	4	2.26	3	4.63	5	23.3	14	29.7	11	52.9	10
1981	.0000	1	.16	1	.92	2	1.30	2	15.5	26	35.2	29	45.0	23	48.8	17	57.6	13
1982	.0000	2	.46	3	6.58	34	11.4	32	17.8	31	34.1	27	61.9	33	102	40	135	43
1983	13.0	40	15.7	40	23.3	41	24.2	41	30.2	37	41.1	33	59.9	32	83.6	36	105	36
1984	17.0	41	17.0	41	17.6	38	20.6	39	31.2	39	44.5	36	65.7	37	89.7	39	109	37
1985	.76	8	1.35	9	2.71	11	3.95	12	6.99	14	10.2	11	13.0	7	16.0	5	47.9	7
1986	3.50	27	4.87	30	6.26	32	11.7	33	17.1	28	21.0	18	41.5	21	68.8	28	96.1	31
1987	4.70	31	5.60	32	6.07	31	6.51	26	10.5	22	23.3	21	44.2	22	60.8	25	88.3	28
1988	.72	7	1.11	7	1.39	5	2.30	5	3.30	6	4.56	4	5.44	3	9.14	3	45.9	6
1989	2.50	16	2.60	16	3.10	13	4.59	15	6.25	13	7.25	9	15.5	9	29.4	10	62.7	14
1990	2.30	14	2.40	13	3.24	14	3.57	11	5.09	9	7.18	8	10.9	5	22.6	8	54.8	12
1991	2.40	15	2.53	15	2.61	9	2.72	8	2.88	5	3.61	3	17.8	10	34.8	13	64.2	15
1992	3.00	23	3.07	18	3.30	15	3.49	10	5.45	10	16.3	15	22.5	12	20.7	6	44.2	5

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E36.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06433000, Redwater River above Belle Fourche

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1947	2,310	5	1,910	4	1,233	4	807	4	520	8	347	9	319	7	307	5	272	2
1948	549	20	280	26	264	25	219	28	194	27	194	27	191	23	190	21	187	19
1949	651	17	586	16	465	14	329	16	284	17	255	16	257	15	229	15	188	17
1950	262	34	252	32	242	28	223	27	202	26	201	23	184	24	176	23	163	24
1951	203	40	191	41	171	41	149	43	145	41	137	40	131	42	129	41	125	41
1952	1,060	10	723	13	451	16	295	20	180	31	177	28	173	28	166	28	149	29
1953	568	19	395	22	310	22	285	21	269	19	226	19	192	22	174	24	159	25
1954	186	43	171	43	160	42	150	42	146	40	138	39	134	39	133	38	131	35
1955	422	23	395	21	299	23	213	29	187	29	172	30	161	30	152	30	141	33
1956	400	24	263	28	195	36	163	39	143	42	134	42	131	41	130	40	125	39
1957	249	36	240	35	216	33	179	33	154	37	150	36	145	36	138	35	125	40
1958	205	39	195	39	187	37	169	36	159	36	144	38	134	40	128	42	124	42
1959	163	44	150	44	136	45	126	46	123	46	119	46	119	46	116	45	113	45
1960	277	32	260	29	219	32	169	37	148	39	127	43	122	44	116	46	111	46
1961	121	47	119	47	117	47	116	47	113	47	110	47	109	47	107	47	95.8	47
1962	3,870	4	1,778	5	1,030	5	632	7	598	4	422	6	311	9	253	11	204	12
1963	984	11	797	10	608	12	463	12	348	13	296	14	267	14	235	14	196	13
1964	1,960	6	1,620	6	1,019	6	744	6	530	6	322	11	271	12	239	13	195	14
1965	5,190	2	3,157	3	1,753	3	1,171	3	767	3	506	2	401	2	335	2	269	3
1966	256	35	241	33	233	31	227	26	222	23	208	22	197	21	186	22	182	20
1967	513	21	409	20	358	19	306	19	246	21	220	20	205	19	191	20	176	22
1968	280	31	259	30	216	34	175	35	162	35	155	33	150	33	149	31	148	30
1969	1,080	9	825	9	587	13	439	13	350	12	269	15	236	16	212	16	189	15
1970	1,490	7	1030	8	679	9	627	8	539	5	462	3	369	3	314	4	250	6
1971	572	18	532	17	428	17	374	15	323	15	298	13	270	13	249	12	225	11
1972	761	14	648	15	462	15	379	14	327	14	318	12	280	11	254	10	228	10
1973	820	13	750	12	732	8	564	10	520	7	429	5	357	5	314	3	267	4
1974	316	28	306	24	291	24	275	22	250	20	215	21	201	20	192	19	188	18
1975	465	22	438	19	386	18	327	17	292	16	252	17	227	17	209	17	188	16
1976	5,030	3	3,667	2	2,394	2	1,345	2	789	2	462	4	358	4	307	6	253	5
1977	351	25	344	23	331	21	307	18	272	18	239	18	211	18	196	18	179	21
1978	828	12	753	11	666	10	567	9	485	10	356	8	318	8	280	8	229	9
1979	283	30	241	34	240	29	230	25	213	24	196	24	183	25	170	26	165	23
1980	332	27	205	38	155	43	154	41	153	38	150	35	146	35	146	32	144	32
1981	155	45	143	45	143	44	139	44	138	43	137	41	135	38	133	39	126	38
1982	5,790	1	4,177	1	3,045	1	1,812	1	1,085	1	644	1	473	1	386	1	288	1
1983	711	15	684	14	625	11	492	11	426	11	342	10	295	10	270	9	231	8
1984	1,200	8	1,047	7	954	7	771	5	510	9	397	7	329	6	285	7	244	7
1985	200	41	190	42	180	40	169	38	167	34	153	34	153	31	145	33	144	31
1986	336	26	286	25	250	26	240	24	228	22	194	26	178	26	170	27	158	26
1987	304	29	273	27	246	27	209	30	189	28	175	29	166	29	157	29	153	27
1988	263	33	255	31	234	30	193	32	167	33	158	31	153	32	145	34	141	34
1989	222	38	214	37	209	35	197	31	184	30	158	32	147	34	135	37	128	36
1990	198	42	194	40	186	38	179	34	171	32	150	37	142	37	136	36	127	37
1991	237	37	218	36	182	39	156	40	132	44	127	44	124	43	125	43	119	43
1992	140	46	135	46	133	46	132	45	128	45	121	45	120	45	117	44	116	44
1993	654	16	517	18	348	20	268	23	209	25	195	25	178	27	173	25	152	28

Table E37.1. Mean flow, in cubic feet per second, for station 06433500, Hay Creek at Belle Fourche

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1954	0.31	0.55	0.45	0.25	0.34	0.43	1.72	0.85	0.49	0.006	0.000	0.36	0.48
1955	.11	.000	.090	.10	.050	.13	2.36	.58	.093	.15	.12	.81	.38
1956	.35	.15	.15	.11	.000	.33	.41	.17	.000	.24	.000	.010	.16
1957	.63	.000	.000	.000	.018	.15	.14	1.08	7.30	.48	.16	2.23	1.01
1958	.058	.12	.22	.019	.075	.38	4.77	.58	.73	.055	.000	.000	.58
1959	.000	.020	.003	.12	.60	.47	.030	.013	.047	.003	.000	.003	.11
1960	.006	.040	.032	.27	.000	1.42	.097	.45	.043	.000	.016	.000	.20
1961	.003	.000	.000	.000	.000	.019	.073	.016	.000	.019	.000	.010	.012
1962	.081	.11	.000	.10	.43	.54	.27	18.7	12.2	4.55	.048	.003	3.11
1963	.19	.007	.000	.000	.007	.36	2.46	.69	3.41	.029	.000	.12	.60
1964	.026	.020	.068	.010	.000	.061	.10	.37	18.6	.71	.055	.000	1.64
1965	.000	.003	.006	.019	.21	.029	.40	13.7	4.37	.032	.000	.087	1.58
1966	.000	.017	.11	.000	.000	2.83	2.28	.39	.050	.86	.087	.14	.57
1967	.19	.11	.047	.091	.23	.15	.36	9.17	3.91	.16	.000	.14	1.22
1968	.33	.19	.013	.026	.048	.25	.35	.14	1.92	.60	.60	.94	.45
1969	.12	.036	.015	.013	.000	1.02	1.44	1.90	.59	.013	.007	.13	.44
1970	1.43	.10	.000	.000	.000	.58	2.46	8.46	6.08	.23	.30	.015	1.65
1971	.065	.39	.040	.13	17.4	1.02	3.93	5.25	9.11	.16	.022	.32	3.03
1972	2.83	.73	.055	.071	1.69	3.31	1.25	7.64	45.8	2.64	.55	.008	5.50
1973	.084	.40	.94	1.00	1.06	5.00	14.6	9.23	5.46	.79	1.42	.13	3.35
1974	.42	.47	.35	1.52	1.64	1.77	12.2	3.28	1.00	.17	.014	.000	1.89
1975	.005	.000	.000	.087	1.05	2.38	4.25	6.13	2.06	.14	.000	.000	1.34
1976	.000	.000	.000	.040	.12	.17	.50	.23	39.7	1.21	.014	.000	3.45
1977	.000	.000	.006	.000	.22	.31	2.43	.37	.023	.010	.020	.028	.28
1978	.66	.064	.12	.011	.98	23.1	2.32	22.2	2.39	.84	.004	.000	4.46
1979	.000	.026	.020	.000	.000	6.66	1.84	.73	1.67	.000	.34	.000	.95
1980	.069	.000	.000	.000	.060	.11	.17	.073	1.53	.000	.033	1.25	.27
1981	.16	.010	.055	.073	.34	.39	.26	.51	1.64	4.25	.25	.31	.69
1982	.15	.038	.058	.000	.078	1.17	.78	50.0	5.02	.24	.040	.051	4.88
1983	7.99	.59	.47	.60	.96	6.00	7.82	2.40	.42	.031	.036	.006	2.29
1984	.018	.000	.000	.95	.10	.35	.67	10.3	18.0	.75	1.51	.002	2.71
1985	.057	.074	.015	.000	.000	2.15	1.06	.15	.21	.000	.049	.000	.32
1986	.020	.000	.000	.000	2.56	.80	4.34	3.97	1.14	.044	.012	.33	1.09
1987	.39	1.23	.21	.039	.28	2.47	6.45	4.83	1.68	.057	.28	.050	1.50
1988	.021	.067	.019	.000	.000	.26	.99	2.08	.11	.004	.24	.043	.32
1989	.009	.010	.017	.13	.007	.89	1.40	3.65	.30	.12	.000	.25	.57
1990	.38	.21	.062	.36	.41	.24	.76	3.35	.43	.26	.000	.040	.55
1991	.023	.15	.016	.000	.047	.081	.40	1.26	3.03	.007	.045	.19	.44
1992	.030	.072	.11	.27	.099	.10	.073	.049	.13	.25	.063	.014	.11
1993	.23	.007	.000	.006	.026	8.85	1.54	.91	12.7	2.95	.40	.053	2.31

Table E37.2. Statistics on mean flow, in cubic feet per second, for station 06433500, Hay Creek at Belle Fourche (October 1953 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	40	40	40	40	40	40	40	40	40	40	40	40	40
Maximum	7.99	1.23	0.94	1.52	17.4	23.1	14.6	50.0	45.8	4.55	1.51	2.23	5.50
Percentile													
75th	0.32	0.15	0.10	0.13	0.43	2.05	2.45	5.91	5.35	0.68	0.22	0.18	2.19
50th	0.075	0.039	0.019	0.032	0.088	0.45	1.15	1.17	1.65	0.16	0.034	0.041	0.82
25th	0.011	0.004	0.000	0.000	0.002	0.19	0.35	0.37	0.23	0.014	0.000	0.002	0.39
Minimum	0.000	0.000	0.000	0.000	0.000	0.019	0.030	0.013	0.000	0.000	0.000	0.000	0.012
Mean	0.44	0.15	0.09	0.16	0.78	1.92	2.24	4.90	5.33	0.58	0.17	0.20	1.41
Standard deviation	1.32	0.25	0.18	0.32	2.75	3.98	3.17	8.97	9.91	1.10	0.34	0.43	1.41
Skewness	5.19	2.63	3.29	2.98	5.92	4.25	2.56	3.69	3.04	2.69	3.10	3.47	1.36
Coefficient of variation	3.03	1.69	1.91	2.00	3.54	2.07	1.41	1.83	1.86	1.90	2.01	2.11	1.00
Percent of annual flow	2.57	0.89	0.56	0.95	4.59	11.31	13.23	28.87	31.46	3.40	0.99	1.19	[1]0.226

[1]Serial correlation for annual mean flows.

Table E37.3. Serial correlation for 1-year lag for monthly mean flow for station 06433500, Hay Creek at Belle Fourche (October 1953 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.073	0.063	0.139	0.356	0.039	0.138	0.368	-0.151	-0.011	-0.148	-0.002	-0.073

Table E37.4. Correlation matrix for monthly mean flow for station 06433500, Hay Creek at Belle Fourche (October 1953 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.420	0.317	0.200	0.014	0.221	0.271	0.002	0.128	0.022	0.004	-0.055
Nov.	*	1.000	0.511	0.299	0.216	0.086	0.502	-0.002	0.147	-0.005	0.160	-0.121
Dec.	*	*	1.000	0.616	0.016	0.196	0.797	0.021	-0.122	-0.075	0.372	-0.102
Jan.	*	*	*	1.000	0.063	0.025	0.677	0.012	-0.009	-0.044	0.461	-0.156
Feb.	*	*	*	*	1.000	0.016	0.193	0.030	0.095	-0.038	-0.053	0.018
Mar.	*	*	*	*	*	1.000	0.216	0.263	0.006	0.136	0.084	-0.175
Apr.	*	*	*	*	*	*	1.000	0.015	-0.131	-0.137	0.309	-0.153
May	*	*	*	*	*	*	*	1.000	0.100	0.137	0.074	-0.164
June	*	*	*	*	*	*	*	*	1.000	0.448	0.289	-0.089
July	*	*	*	*	*	*	*	*	*	1.000	0.207	-0.055
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.010
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E37.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06433500, Hay Creek at Belle Fourche

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1954	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.043	28	0.059	27	0.081	23
1955	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.047	38	.088	34	.092	31	.18	33
1956	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	2	.0000	1	.0010	5	.11	26
1957	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.033	36	.072	32	.093	32	.093	24
1958	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	3	.0000	2	.0000	1	.007	5
1959	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	4	.0010	11	.002	9	.011	8
1960	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	5	.0000	3	.0000	2	.0010	2
1961	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	6	.003	15	.005	12	.012	10
1962	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	7	.0000	4	.002	10	.033	16
1963	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.0000	8	.017	24	.023	23	.022	14
1964	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.0000	9	.0010	12	.0010	6	.011	9
1965	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.0000	10	.014	22	.022	22	.035	17
1966	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.024	32	.056	30	.074	30	.10	25
1967	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.007	24	.026	25	.053	26	.11	28
1968	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0010	23	.005	16	.014	18	.18	32
1969	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.0000	11	.0000	5	.009	16	.27	34
1970	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	.007	25	.078	33	.13	34	.11	27
1971	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	.011	30	.13	37	.28	37	.66	38
1972	.0000	19	.0000	19	.0000	19	.0000	19	.005	36	.036	37	.14	38	.21	36	.48	36
1973	.0000	20	.0000	20	.0000	20	.0000	20	.097	39	.26	39	.32	39	.34	38	.57	37
1974	.0000	21	.0000	21	.0000	21	.0000	21	.0000	19	.0000	12	.002	13	.0010	7	.004	4
1975	.0000	22	.0000	22	.0000	22	.0000	22	.0000	20	.0000	13	.0000	6	.0000	3	.0000	1
1976	.0000	23	.0000	23	.0000	23	.0000	23	.0000	21	.0000	14	.0000	7	.0000	4	.0010	3
1977	.0000	24	.0000	24	.0000	24	.0000	24	.0010	34	.011	31	.010	20	.016	19	.13	29
1978	.0000	25	.0000	25	.0000	25	.0000	25	.0000	22	.0000	15	.0000	8	.007	15	.008	6
1979	.0000	26	.0000	26	.0000	26	.0000	26	.0000	23	.0000	16	.0000	9	.004	11	.016	12
1980	.0000	27	.0000	27	.0000	27	.0000	27	.0000	24	.0000	17	.038	27	.062	28	.15	30
1981	.0000	28	.0000	28	.0000	28	.0000	28	.0000	25	.007	26	.031	26	.038	25	.072	21
1982	.0000	29	.0000	29	.0000	29	.0000	29	.012	38	.027	34	.097	36	.61	39	1.58	39
1983	.0000	30	.0000	30	.0000	30	.0000	30	.0000	26	.0000	18	.006	18	.005	13	.015	11
1984	.0000	31	.0000	31	.0000	31	.0000	31	.0000	27	.0000	19	.005	17	.019	21	.025	15
1985	.0000	32	.0000	32	.0000	32	.0000	32	.0000	28	.0000	20	.0000	10	.0010	8	.008	7
1986	.0000	33	.0000	33	.0000	33	.0000	33	.004	35	.027	35	.062	31	.19	35	.36	35
1987	.0000	34	.0000	34	.0000	34	.0000	34	.0000	29	.0000	21	.006	19	.013	17	.020	13
1988	.0000	35	.0000	35	.0000	35	.0000	35	.0000	30	.008	28	.011	21	.017	20	.035	18
1989	.0000	36	.0000	36	.0000	36	.0000	36	.0000	31	.010	29	.088	35	.11	33	.17	31
1990	.0000	37	.0000	37	.0000	37	.0000	37	.0000	32	.007	27	.015	23	.023	24	.037	19
1991	.0000	38	.0000	38	.0000	38	.0000	38	.007	37	.026	33	.043	29	.067	29	.075	22
1992	.0000	39	.0000	39	.0000	39	.0000	39	.0000	33	.0000	22	.002	14	.006	14	.045	20

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E37.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06433500, Hay Creek at Belle Fourche

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1954	8.00	36	7.33	35	5.19	34	2.93	33	1.84	34	1.33	33	1.06	32	0.90	31	0.68	30
1955	19.0	23	12.0	26	7.16	28	3.89	31	2.51	30	1.48	31	1.03	34	.81	34	.68	31
1956	4.10	37	1.70	37	1.14	38	.80	38	.59	38	.41	38	.31	38	.27	38	.20	38
1957	73.0	12	32.7	17	22.7	15	13.4	15	7.34	16	4.28	20	3.39	19	2.81	19	1.89	19
1958	24.0	22	15.7	21	8.96	24	5.23	25	4.77	22	2.79	22	2.10	23	1.63	23	1.09	24
1959	2.00	39	1.57	38	1.21	37	.93	37	.88	37	.57	37	.39	37	.30	37	.21	37
1960	13.0	31	12.0	27	6.23	30	2.93	34	1.48	36	.78	36	.69	36	.52	36	.39	36
1961	.60	40	.20	40	.13	40	.11	40	.090	40	.055	40	.037	40	.032	40	.021	40
1962	248	4	104	5	62.9	5	39.0	5	30.4	4	18.0	4	12.1	5	9.22	5	6.16	5
1963	19.0	24	13.3	24	9.49	23	5.92	23	3.42	27	2.77	24	2.19	22	1.74	21	1.16	22
1964	136	6	107	4	51.3	8	29.1	8	19.1	6	9.72	8	6.58	9	4.95	10	3.26	11
1965	71.0	13	51.0	13	31.9	13	22.3	10	17.1	9	9.25	9	6.29	10	4.73	12	3.14	12
1966	14.0	30	8.97	32	6.24	29	5.25	24	3.72	25	2.73	25	1.88	25	1.41	25	1.11	23
1967	64.0	15	54.3	12	32.5	12	17.5	13	9.46	14	6.70	15	4.63	16	3.50	17	2.35	17
1968	9.50	33	7.93	33	4.89	35	2.64	36	1.96	33	1.28	34	1.07	31	1.02	29	.75	29
1969	9.40	34	7.37	34	5.70	32	4.80	26	2.95	28	2.08	28	1.59	26	1.26	27	.84	27
1970	55.0	16	37.7	15	22.1	16	12.5	16	10.4	13	8.07	11	5.76	12	4.47	13	3.02	14
1971	141	5	104	6	63.3	4	32.0	7	16.3	10	8.90	10	7.53	8	7.53	8	5.90	7
1972	610	1	332	1	167	2	85.7	2	46.2	2	26.8	2	18.9	2	14.6	2	10.3	1
1973	82.0	11	66.0	11	41.9	9	28.7	9	17.9	8	13.1	7	10.6	6	8.68	6	6.13	6
1974	65.0	14	50.3	14	31.1	14	20.7	12	12.9	12	7.85	12	5.81	11	4.80	11	3.56	10
1975	16.0	29	12.0	28	9.66	22	8.13	21	6.42	20	5.32	17	4.32	17	3.81	16	2.67	15
1976	365	3	222	3	149	3	75.4	3	40.1	3	20.5	3	13.8	4	10.4	4	6.89	4
1977	17.0	28	13.3	25	7.86	26	4.29	29	2.44	31	1.45	32	1.06	33	.84	33	.55	34
1978	123	8	85.0	8	54.7	6	45.9	4	24.5	5	17.1	5	16.7	3	13.0	3	8.74	3
1979	25.0	21	23.0	18	17.5	18	12.0	17	6.97	18	4.41	18	3.16	20	2.79	20	1.88	20
1980	31.0	19	12.0	29	5.64	33	2.74	35	1.55	35	.81	35	.81	35	.71	35	.51	35
1981	54.0	17	37.7	16	18.5	17	9.07	19	4.62	23	3.10	21	2.20	21	1.73	22	1.27	21
1982	523	2	258	2	177	1	99.5	1	54.9	1	28.4	1	19.3	1	14.7	1	9.68	2
1983	102	9	68.7	10	32.7	11	15.9	14	8.41	15	7.04	14	5.48	14	4.35	14	3.06	13
1984	125	7	95.7	7	53.6	7	32.9	6	18.2	7	14.3	6	9.90	7	7.84	7	5.25	8
1985	13.0	32	10.3	30	7.34	27	4.40	28	2.76	29	1.68	29	1.17	29	.91	30	.61	33
1986	32.0	18	21.0	19	12.0	21	7.88	22	7.10	17	4.35	19	3.81	18	3.19	18	2.11	18
1987	18.0	26	15.3	22	14.3	19	10.3	18	6.50	19	5.61	16	4.72	15	3.92	15	2.64	16
1988	8.70	35	6.90	36	4.39	36	3.25	32	2.20	32	1.60	30	1.15	30	.88	32	.62	32
1989	19.0	25	17.3	20	13.8	20	8.62	20	4.94	21	2.78	23	2.08	24	1.60	24	1.09	25
1990	28.0	20	14.7	23	7.90	25	4.65	27	3.44	26	2.24	26	1.58	27	1.27	26	.93	26
1991	18.0	27	9.73	31	5.91	31	3.98	30	3.87	24	2.18	27	1.58	28	1.20	28	.82	28
1992	2.30	38	1.33	39	.60	39	.35	39	.27	39	.21	39	.19	39	.16	39	.13	39
1993	88.0	10	74.0	9	41.1	10	21.5	11	13.6	11	7.85	13	5.61	13	5.93	9	4.56	9

Table E38.1. Mean flow, in cubic feet per second, for station 06434500, Inlet Canal near Belle Fourche

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	114	123	136	159	160	206	129	182	13.1	134	123	151	136
1947	22.4	7.23	8.32	95.2	128	9.84	.000	215	115	180	119	114	84.4
1948	163	179	187	163	149	119	.000	67.3	156	186	101	36.2	126
1949	83.3	120	131	86.1	64.3	3.39	204	337	195	58.1	14.9	92.0	116
1950	121	123	127	130	158	219	711	356	123	29.9	37.2	70.2	183
1951	131	118	141	135	131	149	151	77.1	163	60.2	56.8	243	129
1952	150	142	125	121	199	375	521	299	96.4	87.7	34.9	47.0	183
1953	77.5	96.9	126	133	136	194	192	547	483	123	280	97.5	208
1954	78.0	119	157	138	153	163	238	128	162	36.7	25.6	18.0	118
1955	69.6	104	121	127	118	144	539	473	387	106	94.7	173	204
1956	142	122	173	139	144	317	285	160	81.3	36.8	21.5	46.6	139
1957	77.2	142	136	87.7	138	217	212	271	387	142	57.5	123	166
1958	108	131	141	122	127	179	346	214	167	100	55.6	34.6	144
1959	68.6	110	124	115	123	273	246	130	75.4	110	41.5	17.9	120
1960	95.8	122	127	102	111	406	217	147	66.8	3.82	36.0	28.0	122
1961	55.4	100	119	112	115	155	84.9	31.2	12.0	16.2	2.68	35.2	69.7
1962	78.0	104	101	109	210	379	368	548	669	159	75.9	81.1	240
1963	149	152	146	116	258	233	47.1	175	265	96.3	74.4	148	154
1964	109	152	133	147	146	172	237	256	518	181	127	122	191
1965	134	137	145	158	171	198	487	55.7	2.66	83.1	75.8	148	149
1966	190	189	187	168	55.7	.000	24.4	40.6	122	159	122	117	115
1967	157	160	150	158	194	408	279	432	103	101	105	190	203
1968	163	178	159	155	180	292	202	153	256	125	111	127	175
1969	115	159	147	146	146	321	443	115	235	170	76.2	83.1	179
1970	124	175	163	137	158	204	456	299	149	156	176	131	194
1971	170	217	194	162	337	354	136	8.16	120	136	119	184	177
1972	358	209	185	194	271	145	11.2	1.55	82.7	242	252	207	180
1973	281	235	211	213	16.5	.000	.000	203	238	157	172	212	163
1974	207	225	212	221	284	234	.40	69.5	162	142	152	151	171
1975	131	191	174	163	171	281	523	259	241	99.2	94.0	130	204
1976	136	176	173	170	198	221	268	192	321	85.1	67.2	164	180
1977	174	187	179	167	185	214	579	340	130	123	278	149	225
1978	263	184	170	160	164	693	414	72.0	241	209	146	156	240
1979	167	197	190	143	151	377	348	46.5	179	109	159	120	182
1980	133	170	167	142	157	196	186	88.3	197	64.0	281	133	159
1981	134	153	150	147	151	139	138	273	303	288	125	132	178
1982	127	141	120	89.8	142	165	178	704	265	102	121	143	192
1983	389	210	171	212	116	.000	.000	8.10	208	145	143	142	146
1984	187	181	145	186	188	271	254	460	261	165	108	139	212
1985	184	192	180	144	152	334	231	96.5	70.1	83.3	66.2	83.6	151
1986	153	120	125	146	170	277	420	515	248	95.2	83.7	183	211
1987	222	195	167	155	171	387	240	172	118	125	151	139	187
1988	153	103	146	92.3	107	232	213	220	81.9	88.6	66.8	85.2	133
1989	140	146	133	107	107	270	212	328	94.9	76.5	73.5	96.1	149
1990	142	157	137	150	151	206	184	310	116	67.1	75.8	44.0	145
1991	90.3	110	103	96.4	127	138	161	308	222	55.2	67.4	78.4	130
1992	103	143	132	116	123	130	125	28.6	44.3	71.0	53.7	47.9	93.0
1993	88.0	124	111	90.6	101	283	227	250	542	88.9	88.2	92.6	174

Table E38.2. Statistics on mean flow, in cubic feet per second, for station 06434500, Inlet Canal near Belle Fourche (October 1945 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	48	48	48	48	48	48	48	48	48	48	48	48	48
Maximum	389	235	212	221	337	693	711	704	669	288	281	243	240
Percentile													
75th	166	183	172	160	171	290	347	309	254	153	126	149	190
50th	134	149	145	142	151	215	215	197	162	104	91.1	122	168
25th	97.6	120	127	115	124	150	136	79.9	98.0	78.1	59.7	79.1	134
Minimum	22.4	7.23	8.32	86.1	16.5	0.000	0.000	1.55	2.66	3.82	2.68	17.9	69.7
Mean	143.92	150.65	147.61	140.13	154.45	226.73	243.08	222.13	197.68	113.71	103.93	114.30	163.13
Standard deviation	69.80	42.35	34.03	33.29	55.20	127.97	170.54	164.10	142.06	56.73	66.38	54.58	38.75
Skewness	1.60	-0.48	-1.16	0.38	0.84	0.75	0.64	0.86	1.38	0.63	1.22	0.03	-0.20
Coefficient of variation	0.48	0.28	0.23	0.24	0.36	0.56	0.70	0.74	0.72	0.50	0.64	0.48	0.24
Percent of annual flow	7.35	7.69	7.54	7.16	7.89	11.58	12.41	11.34	10.09	5.81	5.31	5.84	[1]0.117

[1]Serial correlation for annual mean flows.

Table E38.3. Serial correlation for 1-year lag for monthly mean flow for station 06434500, Inlet Canal near Belle Fourche (October 1945 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.409	0.433	0.231	0.416	-0.021	0.133	0.081	-0.260	-0.168	0.152	0.224	0.282

Table E38.4. Correlation matrix for monthly mean flow for station 06434500, Inlet Canal near Belle Fourche (October 1945 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.763	0.658	0.745	0.199	0.041	-0.235	-0.340	-0.176	0.395	0.426	0.460
Nov.	*	1.000	0.896	0.753	0.306	0.145	-0.107	-0.346	-0.086	0.323	0.406	0.389
Dec.	*	*	1.000	0.713	0.236	0.126	-0.082	-0.428	-0.182	0.171	0.326	0.289
Jan.	*	*	*	1.000	0.308	-0.041	-0.149	-0.336	-0.131	0.416	0.464	0.472
Feb.	*	*	*	*	1.000	0.412	0.067	-0.086	-0.009	0.209	0.203	0.277
Mar.	*	*	*	*	*	1.000	0.445	0.031	0.042	-0.042	-0.057	-0.041
Apr.	*	*	*	*	*	*	1.000	0.367	0.090	-0.219	-0.108	-0.082
May	*	*	*	*	*	*	*	1.000	0.490	-0.038	0.032	0.054
June	*	*	*	*	*	*	*	*	1.000	0.292	0.163	0.143
July	*	*	*	*	*	*	*	*	*	1.000	0.494	0.390
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.488
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E38.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06434500, Inlet Canal near Belle Fourche

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1946	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	4.48	2	5.28	1	21.4	2	45.1	2
1947	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	108	40	112	37	125	39	124	31
1948	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	32.1	14	50.8	12	71.0	14	81.3	11
1949	.0000	4	.0000	4	5.20	22	5.89	20	13.6	17	36.3	16	50.8	13	65.2	12	85.8	13
1950	10.0	34	10.0	33	10.6	31	11.1	25	15.7	18	28.2	10	39.8	8	58.9	9	81.0	9
1951	5.20	29	6.13	29	6.91	25	7.97	22	18.0	20	56.1	19	82.2	25	86.3	22	123	28
1952	7.00	31	8.00	31	8.71	28	15.9	27	34.4	25	37.9	17	45.4	9	54.1	8	69.1	7
1953	52.0	45	65.3	46	67.3	45	68.9	42	76.0	38	85.8	31	94.7	30	108	29	121	27
1954	2.70	26	2.90	25	3.06	20	3.61	17	9.00	14	17.1	8	22.4	4	35.3	4	62.0	5
1955	56.0	46	57.0	44	60.7	42	64.6	41	92.0	43	99.2	37	116	40	129	40	130	34
1956	4.70	28	5.23	28	6.39	23	9.19	24	18.4	21	25.7	9	33.3	6	43.4	5	64.0	6
1957	6.00	30	6.33	30	7.43	26	8.36	23	30.4	24	84.7	30	89.3	27	96.9	26	110	21
1958	9.00	33	9.33	32	10.1	30	12.8	26	26.3	23	39.1	18	51.5	14	63.9	11	81.1	10
1959	2.70	27	3.03	26	3.50	21	4.03	18	10.0	16	28.2	11	48.0	11	58.9	10	71.1	8
1960	.10	22	.40	22	.44	18	.63	15	3.08	13	16.3	7	20.3	3	27.1	3	46.5	3
1961	.70	23	.77	23	1.47	19	1.63	16	2.03	12	4.82	3	10.2	2	9.75	1	27.9	1
1962	1.20	25	5.00	27	13.6	33	36.9	34	60.0	32	64.7	23	82.0	24	95.9	25	113	23
1963	.0000	5	.0000	5	.0000	4	.079	14	38.7	26	81.4	29	99.4	32	104	27	117	25
1964	48.0	43	49.0	42	60.7	43	84.1	45	87.9	42	118	43	120	42	124	37	131	35
1965	.0000	6	.0000	6	.0000	5	.0000	4	.0000	4	6.28	4	36.2	7	46.8	6	89.4	14
1966	.0000	7	.0000	7	.0000	6	.0000	5	9.83	15	32.3	15	61.9	16	82.2	19	97.6	17
1967	16.0	37	16.0	36	16.9	34	26.4	29	82.4	40	92.3	34	96.7	31	122	35	139	39
1968	40.0	42	50.0	43	62.1	44	84.6	46	109	46	112	42	117	41	117	33	129	33
1969	1.00	24	1.40	24	8.27	27	36.3	33	70.4	35	72.9	27	89.9	28	107	28	126	32
1970	12.0	35	12.7	35	13.3	32	30.2	31	106	45	125	46	148	45	143	44	152	41
1971	.0000	8	.0000	8	.0000	7	.0000	6	.0000	5	9.93	6	57.0	15	72.4	16	111	22
1972	.0000	9	.0000	9	.0000	8	.0000	7	.0000	6	6.40	5	31.1	5	83.2	20	133	37
1973	.0000	10	.0000	10	.0000	9	.0000	8	.0000	7	92.4	35	146	44	150	45	164	45
1974	.0000	11	.0000	11	.0000	10	.0000	9	.0000	8	30.9	12	77.7	22	93.2	24	113	24
1975	.0000	12	.0000	12	9.00	29	61.3	39	74.5	37	89.3	33	102	34	110	31	132	36
1976	.0000	13	.0000	13	16.9	35	34.1	32	64.8	34	71.1	25	88.2	26	109	30	135	38
1977	61.0	47	69.3	47	82.9	47	86.6	47	116	47	124	45	163	47	167	47	180	47
1978	.0000	14	.0000	14	.0000	11	.0000	10	.0000	9	134	47	156	46	155	46	158	44
1979	.0000	15	.0000	15	.0000	12	7.79	21	45.4	28	109	41	110	36	122	36	124	30
1980	18.0	38	18.7	38	20.4	36	25.1	28	51.3	30	119	44	113	38	130	41	144	40
1981	51.0	44	58.7	45	76.3	46	78.9	44	85.1	41	102	38	114	39	118	34	120	26
1982	.0000	16	.0000	16	.0000	13	.0000	11	.0000	10	56.9	20	94.6	29	125	38	177	46
1983	.0000	17	.0000	17	.0000	14	.0000	12	.0000	11	.0000	1	71.1	20	89.3	23	107	20
1984	.0000	18	.0000	18	.0000	15	69.1	43	99.0	44	107	39	123	43	140	42	155	42
1985	8.00	32	10.8	34	26.5	37	40.0	36	48.7	29	70.1	24	69.5	19	72.3	15	91.4	15
1986	15.0	36	17.0	37	30.4	39	63.4	40	81.4	39	.8	32	102	35	142	43	156	43
1987	.0000	19	.0000	19	.0000	16	.0000	13	25.2	22	95.8	36	101	33	112	32	123	29
1988	22.0	40	27.3	40	42.4	41	55.0	38	64.4	33	71.7	26	76.6	21	79.1	18	99.1	18
1989	31.0	41	31.7	41	38.4	40	48.0	37	72.4	36	74.8	28	79.1	23	84.4	21	106	19
1990	.0000	20	.0000	20	6.57	24	28.4	30	42.7	27	59.5	21	62.5	17	68.2	13	81.6	12
1991	19.0	39	20.3	39	29.6	38	39.0	35	52.5	31	61.2	22	65.6	18	72.6	17	94.8	16
1992	.0000	21	.0000	21	.0000	17	4.34	19	16.7	19	32.0	13	46.1	10	48.2	7	55.4	4

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E38.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06434500, Inlet Canal near Belle Fourche

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1946	488	43	435	43	392	42	351	39	228	43	191	42	187	41	178	41	168	39
1947	541	42	541	41	488	36	256	46	216	45	168	45	171	45	159	45	124	47
1948	320	46	304	46	291	46	279	45	222	44	184	44	180	44	174	43	160	42
1949	430	44	387	45	383	44	368	37	343	34	304	27	250	31	202	36	151	43
1950	1,110	17	1,110	9	1,073	7	915	4	714	4	572	3	448	3	371	6	286	6
1951	996	21	832	24	580	28	371	36	243	41	154	46	146	46	144	46	138	44
1952	1,330	5	1,170	7	1,108	5	854	5	647	6	459	10	408	8	350	8	276	8
1953	1,180	9	1,068	13	886	14	667	13	551	12	525	5	412	6	373	5	305	2
1954	749	35	599	35	424	39	299	43	240	42	202	41	185	42	175	42	165	40
1955	1,160	12	1,041	15	780	16	706	12	547	13	511	6	470	2	388	2	297	4
1956	708	37	629	34	555	32	495	27	388	24	308	26	263	26	232	29	205	28
1957	790	33	751	28	662	24	536	20	408	23	342	21	292	21	272	18	227	22
1958	880	28	775	26	644	26	507	25	376	27	310	24	260	28	230	30	194	30
1959	720	36	687	32	571	29	409	34	331	35	275	34	230	36	202	37	173	36
1960	1,120	15	1,087	12	998	10	759	9	506	16	337	22	262	27	226	32	189	32
1961	219	47	209	47	197	47	191	47	161	47	139	48	130	48	127	48	115	48
1962	1,340	2	1,327	2	1,311	2	1,198	1	986	1	677	1	558	1	502	1	394	1
1963	632	39	501	42	410	40	376	35	300	37	246	39	204	39	190	39	182	34
1964	1,180	10	1,115	8	1,005	9	846	6	576	10	394	15	341	14	309	14	255	13
1965	1,170	11	1,028	16	746	20	580	18	495	17	350	20	293	20	259	22	218	24
1966	992	22	579	38	370	45	290	44	196	46	190	43	189	40	184	40	132	45
1967	1,120	16	1,061	14	925	11	586	17	439	20	420	12	377	11	333	9	272	11
1968	626	40	581	37	474	37	360	38	296	38	251	37	228	38	226	31	208	26
1969	823	31	688	31	556	31	504	26	478	18	390	17	309	17	288	16	238	18
1970	1,040	19	1,009	18	790	15	625	15	577	9	425	11	339	15	291	15	246	16
1971	909	26	877	19	768	18	555	19	445	19	393	16	318	16	284	17	254	14
1972	977	24	873	20	695	22	520	23	375	28	286	31	253	30	242	26	227	23
1973	751	34	663	33	570	30	488	29	365	31	266	35	242	33	235	27	164	41
1974	859	29	706	30	541	33	434	31	373	29	317	23	275	24	261	21	228	21
1975	988	23	860	21	767	19	663	14	617	7	472	8	382	9	332	10	274	10
1976	946	25	845	22	778	17	525	22	353	32	288	30	283	23	263	20	234	20
1977	1,160	13	1,107	10	924	12	730	11	617	8	468	9	381	10	331	11	277	7
1978	1,340	3	1,317	3	1,229	3	1,099	3	814	3	587	2	444	4	374	4	305	3
1979	633	38	554	39	517	34	466	30	418	21	366	19	294	19	257	23	235	19
1980	887	27	581	36	408	41	318	41	290	39	211	40	182	43	171	44	170	38
1981	1,080	18	843	23	628	27	431	32	352	33	294	29	291	22	256	24	217	25
1982	1,410	1	1370	1	1326	1	1,195	2	868	2	531	4	416	5	351	7	266	12
1983	1,210	8	1,015	17	723	21	535	21	414	22	303	28	260	29	248	25	183	33
1984	1,270	7	1,187	6	1,149	4	829	7	537	14	418	13	367	12	325	13	275	9
1985	825	30	771	27	650	25	492	28	371	30	285	32	246	32	217	33	206	27
1986	1,280	6	1,207	5	1,051	8	735	10	666	5	487	7	409	7	375	3	297	5
1987	1,140	14	1,093	11	899	13	598	16	507	15	378	18	305	18	268	19	241	17
1988	419	45	400	44	385	43	307	42	252	40	249	38	228	37	197	38	170	37
1989	812	32	785	25	669	23	513	24	383	25	309	25	275	25	234	28	194	29
1990	1,030	20	722	29	494	35	345	40	320	36	252	36	234	35	217	34	191	31
1991	623	41	547	40	455	38	426	33	376	26	281	33	236	34	211	35	175	35
1992	173	48	159	48	157	48	153	48	146	48	139	47	132	47	129	47	128	46
1993	1,340	4	1,313	4	1,108	6	812	8	556	11	403	14	347	13	329	12	252	15

Table E39.1. Mean flow, in cubic feet per second, for station 06435500, Belle Fourche River near Belle Fourche

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1906	(1)	(1)	(1)	(1)	(1)	(1)	(1)	940	711	148	266	223	(2)
1907	225	221	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
1912	(1)	(1)	(1)	113	241	310	3,466	1,118	201	198	966	428	(2)
1913	376	200	220	260	326	792	1,577	320	416	226	221	446	447
1914	355	267	245	330	336	322	285	466	312	121	624	243	326
1915	411	266	228	151	150	304	1,526	740	1,581	1,518	954	704	712
1916	681	246	535	412	966	733	681	863	898	279	284	148	559
1917	223	170	122	221	227	439	1,562	524	312	30.9	34.4	96.2	329
1918	173	183	180	191	563	741	393	549	270	461	163	270	344
1919	189	197	218	287	165	252	392	303	16.4	89.1	107	95.6	193
1920	222	276	215	188	190	4,278	646	1,658	389	153	67.4	131	708
1921	256	181	164	207	378	345	165	104	780	288	105	50.5	250
1922	112	138	137	193	218	476	526	1,898	915	682	416	144	491
1923	166	271	180	202	163	748	956	463	378	650	856	514	464
1924	1,126	266	303	306	739	662	4,855	1,050	436	275	158	144	854
1925	402	251	250	199	937	1,380	699	261	440	114	174	158	435
1926	223	202	196	255	367	966	449	301	281	706	128	139	352
1927	166	184	173	167	185	287	823	1,717	1,184	494	673	213	524
1928	267	258	240	611	386	1,581	649	516	462	782	156	244	515
1929	199	213	175	145	139	1,745	3,355	1,489	1,367	354	88.3	163	786
1930	256	200	231	210	423	414	458	211	425	115	58.1	101	257
1931	224	224	249	175	166	211	245	132	79.8	16.9	37.5	54.7	151
1932	125	132	172	170	216	345	718	348	294	131	52.6	77.1	231
1933	114	137	97.6	146	128	466	409	1,147	230	54.9	26.6	135	259
1934	159	162	140	164	166	166	172	36.4	156	41.8	33.2	59.5	121
1935	100	92.1	137	140	140	234	154	139	301	55.7	5.94	24.6	127
1936	64.1	108	115	160	164	423	204	82.3	9.67	21.8	9.55	28.5	116
1937	85.9	119	131	133	136	158	136	49	381	655	21.7	85.8	175
1938	89.7	112	124	136	141	209	147	131	80.8	22.2	15	71.6	106
1939	68.9	104	109	132	114	270	147	50.1	137	31.7	16.7	19.4	99.8
1940	59.2	62.4	97.8	92.1	115	166	263	195	326	32.2	26.8	26.8	121
1941	68.9	91.2	110	98	108	110	415	315	1,672	152	62.6	311	291
1942	109	95	125	114	118	218	204	1,038	637	110	42.5	71.3	241
1943	91.1	113	152	129	385	973	355	141	412	157	6.9	44.9	246
1944	77.5	123	129	125	127	549	1,275	498	1,639	235	42.1	31.3	402
1945	89.1	131	140	166	217	656	343	326	458	215	48.4	168	246

[1]Indicates a no-value month.

[2]Incomplete water year.

[3]Additional records for water years 1946-50, which were computed by combing records for stations 06434500 and 06436000, were published in Water Supply Paper 1309 (U.S. Geological Survey, 1959).

Table E39.2. Statistics on mean flow, in cubic feet per second, for station 06435500, Belle Fourche River near Belle Fourche (October 1912 through September 1945)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	33	33	33	33	33	33	33	33	33	33	33	33	33
Maximum	1,126	276	535	611	966	4,278	4,855	1,898	1,672	1,518	954	704	854
Percentile													
75th	256	235	224	216	372	744	771	802	709	407	168	190	477
50th	166	181	172	170	185	423	415	326	389	153	62.6	131	291
25th	90.4	116	127	138	139	243	225	140	276	55.3	30.0	57.1	184
Minimum	59.2	62.4	97.6	92.1	108	110	136	36.4	9.67	16.9	5.94	19.4	99.8
Mean	222.05	174.93	183.07	200.42	281.75	655.15	763.16	547.26	535.60	280.92	173.16	157.97	347.77
Standard deviation	209.65	64.13	82.53	101.47	224.34	767.14	974.71	524.46	466.07	319.15	248.55	151.34	206.30
Skewness	2.95	0.12	2.54	2.47	1.99	3.60	3.06	1.32	1.38	2.16	2.11	2.10	0.89
Coefficient of variation	0.94	0.37	0.45	0.51	0.80	1.17	1.28	0.96	0.87	1.14	1.44	0.96	0.59
Percent of annual flow	5.32	4.19	4.38	4.80	6.75	15.69	18.28	13.11	12.83	6.73	4.15	3.78	[1]0.394

[1]Serial correlation for annual mean flows.

Table E39.3. Correlation matrix for monthly mean flow for station 06435500, Belle Fourche River near Belle Fourche (October 1912 through September 1945)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.654	0.754	0.515	0.717	0.130	0.694	0.205	0.064	0.168	0.250	0.246
Nov.	*	1.000	0.697	0.616	0.498	0.478	0.414	0.288	0.049	0.400	0.547	0.519
Dec.	*	*	1.000	0.651	0.760	0.219	0.275	0.150	0.067	0.171	0.283	0.220
Jan.	*	*	*	1.000	0.514	0.227	0.164	0.069	-0.134	0.233	0.181	0.180
Feb.	*	*	*	*	1.000	0.181	0.261	0.016	-0.048	0.025	0.060	0.045
Mar.	*	*	*	*	*	1.000	0.197	0.434	0.017	0.065	-0.052	0.065
Apr.	*	*	*	*	*	*	1.000	0.399	0.309	0.187	0.153	0.245
May	*	*	*	*	*	*	*	1.000	0.421	0.273	0.342	0.183
June	*	*	*	*	*	*	*	*	1.000	0.456	0.359	0.387
July	*	*	*	*	*	*	*	*	*	1.000	0.679	0.704
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.790
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E39.4. Serial correlation for 1-year lag for monthly mean flow for station 06435500, Belle Fourche River near Belle Fourche (October 1912 through September 1945)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.338	0.714	0.249	0.048	0.154	-0.017	0.044	-0.160	0.096	0.109	0.451	0.198

Table E39.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06435500, Belle Fourche River near Belle Fourche

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1912	100	32	100	30	107	29	139	30	194	30	196	30	226	29	236	29	302	30
1913	94.0	30	94.7	28	94.9	27	94.9	26	133	27	180	29	263	31	265	31	286	29
1914	.0000	1	.0000	1	30.9	19	51.1	20	74.9	22	150	25	167	25	183	25	240	28
1915	240	33	240	33	240	33	240	33	240	33	390	33	399	33	426	33	525	33
1916	83.0	28	88.7	27	115	32	116	27	119	25	141	24	167	24	166	22	184	23
1917	8.00	14	8.67	12	9.29	11	10.2	11	18.8	11	31.3	9	48.9	9	75.3	12	113	14
1918	30.0	22	38.7	22	53.4	23	58.1	23	144	29	175	28	189	28	195	27	210	26
1919	.0000	2	.0000	2	.0000	1	4.71	4	13.9	7	39.7	12	71.5	15	74.7	11	120	16
1920	25.0	21	28.0	20	45.3	21	57.0	21	64.9	20	83.7	18	109	19	144	19	154	18
1921	3.00	10	12.3	15	13.1	13	16.5	13	35.5	15	55.8	16	77.4	16	92.9	16	118	15
1922	78.0	27	104	31	107	28	125	29	135	28	151	27	179	27	187	26	187	24
1923	50.0	25	62.7	25	92.4	26	162	32	207	32	261	32	272	32	317	32	517	32
1924	92.0	29	98.0	29	109	30	119	28	129	26	150	26	176	26	221	28	233	27
1925	22.0	20	30.7	21	37.4	20	43.2	19	54.3	18	127	21	142	21	163	21	177	21
1926	64.0	26	66.3	26	67.3	25	80.6	25	118	24	130	22	142	20	149	20	158	20
1927	99.0	31	107	32	115	31	144	31	203	31	233	31	242	30	239	30	328	31
1928	32.0	23	41.0	24	53.1	22	57.6	22	80.0	23	140	23	152	22	167	23	178	22
1929	39.0	24	39.0	23	57.0	24	69.9	24	73.5	21	96.5	19	164	23	175	24	187	25
1930	19.0	19	19.7	19	22.1	18	32.2	18	48.7	17	71.2	17	89.9	17	120	18	157	19
1931	5.00	11	5.67	11	6.14	9	7.64	9	16.9	9	25.3	8	29.7	6	42.0	6	71.5	7
1932	15.0	16	15.3	16	17.9	14	23.1	16	40.9	16	46.0	14	61.9	12	77.3	14	91.9	9
1933	8.00	15	9.67	13	12.1	12	13.9	12	19.1	12	33.0	10	69.5	14	90.0	15	112	13
1934	2.00	3	3.00	9	3.29	5	5.79	7	18.0	10	24.6	7	42.9	8	57.3	8	70.4	6
1935	2.00	4	2.00	3	2.00	2	2.14	1	4.50	1	14.5	4	27.5	5	36.8	3	61.2	5
1936	2.00	5	2.00	4	4.71	8	5.00	5	6.10	2	10.5	1	13.6	1	14.8	1	36.2	1
1937	5.00	12	5.33	10	7.29	10	7.93	10	13.9	8	52.6	15	64.9	13	75.3	13	94.8	12
1938	2.00	6	2.67	8	3.29	6	4.36	3	10.9	6	12.1	2	25.3	3	39.6	5	57.9	4
1939	2.00	7	2.00	5	2.00	3	2.57	2	10.6	5	12.6	3	21.8	2	31.3	2	47.4	2
1940	2.00	8	2.33	7	3.14	4	6.29	8	10.2	4	23.8	6	26.9	4	37.9	4	57.5	3
1941	15.0	17	17.3	17	20.6	17	29.2	17	57.5	19	96.8	20	103	18	109	17	125	17
1942	18.0	18	18.3	18	18.4	15	19.6	14	27.8	14	42.6	13	60.9	11	68.6	10	92.2	10
1943	2.00	9	2.00	6	3.29	7	5.14	6	6.80	3	14.9	5	36.4	7	52.3	7	77.5	8
1944	6.00	13	11.3	14	19.3	16	20.3	15	23.3	13	36.2	11	52.8	10	65.1	9	93.6	11

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E39.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days in year ending September 30, for station 06435500, Belle Fourche River near Belle Fourche

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1913	5,450	10	5,027	9	3,710	9	2,485	9	1,697	8	1,195	8	925	10	785	11	620	12
1914	4,930	15	3,550	14	2,016	20	1,126	22	675	24	456	25	427	23	391	23	369	21
1915	7,450	8	6,537	4	4,254	6	2,438	10	1,794	6	1,668	4	1,371	4	1,382	4	1,169	4
1916	2,670	22	2,523	20	2,033	19	1,500	17	1,216	15	900	14	831	12	849	8	757	7
1917	5,400	11	3,417	15	3,066	13	2,512	8	1,670	10	1,080	10	889	11	724	12	544	13
1918	2,340	23	1,853	23	1,309	23	1,135	21	920	19	656	19	627	17	563	16	494	15
1919	877	30	699	30	583	29	465	28	451	27	393	26	323	26	288	26	279	25
1920	15,300	2	11,850	2	9,069	2	8,068	2	4,569	2	3,050	1	2,257	2	1,796	3	1,242	3
1921	3,860	19	2,603	19	1,555	22	1,057	23	879	20	554	21	407	24	364	24	344	24
1922	11,500	4	5,920	6	4,491	4	3,217	4	2,135	4	1,503	6	1,247	6	1,038	6	826	6
1923	4,410	16	3,407	16	2,894	14	1,967	12	1,310	14	905	13	751	14	653	13	678	10
1924	22,400	1	17,900	1	12,500	1	8,240	1	4,892	1	2,964	2	2,208	3	1,836	2	1,330	2
1925	3,890	18	3,093	17	2,227	16	1,607	16	1,471	12	1,197	7	1,007	8	820	10	647	11
1926	2,740	21	2,180	22	1,600	21	1,288	19	982	18	724	18	600	18	528	18	518	14
1927	8,140	6	5,397	8	3,869	7	2,597	7	2,065	5	1,559	5	1,271	5	1,085	5	868	5
1928	8,170	5	5,887	7	3,714	8	2,661	6	1,725	7	1,170	9	932	9	842	9	736	8
1929	15,000	3	11,380	3	7,004	3	5,143	3	3,717	3	2,671	3	2,461	1	2,019	1	1,404	1
1930	2,060	24	1,125	25	834	27	659	26	499	25	483	24	431	22	423	22	359	22
1931	460	31	365	31	308	31	272	31	256	31	247	29	237	29	220	29	213	27
1932	6,180	9	4,100	13	2,317	15	1,314	18	826	21	562	20	476	20	434	21	355	23
1933	5,090	14	4,387	12	3,181	12	1,760	14	1,163	16	813	16	705	15	574	15	424	17
1934	410	32	289	33	258	33	234	33	182	33	173	33	171	32	168	31	164	31
1935	953	29	721	29	544	30	415	30	305	29	221	30	201	30	208	30	185	30
1936	1,400	27	1,075	26	943	25	667	25	453	26	330	27	271	27	241	27	199	28
1937	3,920	17	2,650	18	2,040	18	1,234	20	678	23	528	22	367	25	310	25	253	26
1938	326	33	305	32	277	32	262	32	214	32	183	32	167	33	160	33	150	32
1939	987	28	896	28	645	28	424	29	284	30	211	31	179	31	167	32	146	33
1940	2,040	25	1,007	27	852	26	550	27	335	28	323	28	268	28	241	28	193	29
1941	8,090	7	6,367	5	4,303	5	2,900	5	1,672	9	1,002	12	817	13	643	14	483	16
1942	2,830	20	2,430	21	2,149	17	1,680	15	1,359	13	852	15	642	16	539	17	396	19
1943	5,400	12	4,710	10	3,310	11	1,955	13	1,133	17	768	17	580	19	510	19	407	18
1944	5,220	13	4,510	11	3,587	10	2,393	11	1,658	11	1,069	11	1,155	7	1,022	7	719	9
1945	1,480	26	1,480	24	1,216	24	964	24	758	22	523	23	463	21	461	20	372	20

Table E40.1. Mean flow, in cubic feet per second, for station 06436000, Belle Fourche River near Fruitdale

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	(1)	34.8	3.90	3.55	3.57	54.9	184	726	2,011	331	19.8	479	(2)
1947	556	288	228	108	344	691	815	171	999	220	17.2	5.93	369
1948	15.1	45.4	12.5	18.2	59.3	586	368	177	264	132	11.2	26.3	143
1949	47.2	53.7	25.4	6.35	98.8	909	580	119	47.2	12.0	5.63	10.7	160
1950	12.3	17.3	17.0	6.16	7.82	12.3	203	328	16.7	6.87	7.64	11.3	54.1
1951	11.0	11.3	5.13	2.74	2.68	2.86	3.40	3.79	14.9	10.4	8.57	18.5	7.95
1952	11.4	16.5	5.13	4.23	6.24	39.4	14.4	10.8	6.57	18.3	9.13	10.5	12.8
1953	14.0	15.6	8.00	4.81	4.57	6.32	5.16	6.80	102	8.34	142	10.8	27.4
1954	13.6	17.9	6.26	4.16	4.79	5.27	3.92	4.54	5.65	3.08	2.38	7.29	6.56
1955	15.8	16.9	11.3	2.52	1.32	3.26	24.3	4.64	7.47	5.96	9.02	9.90	9.37
1956	14.7	11.9	9.97	3.71	3.41	3.50	3.80	5.30	8.23	6.76	6.23	8.50	7.18
1957	8.13	8.07	4.26	1.97	2.36	3.88	4.10	5.55	8.13	8.43	12.7	10.8	6.55
1958	6.02	5.38	3.72	3.60	3.27	3.29	4.95	3.87	9.76	11.7	9.52	10.6	6.32
1959	9.52	7.43	5.74	4.00	4.00	4.00	5.00	6.00	5.00	3.00	1.68	2.24	4.81
1960	4.62	4.04	3.71	2.75	3.12	44.4	4.30	3.27	2.86	.22	.30	2.47	6.38
1961	3.82	4.07	3.77	3.65	3.77	3.81	3.44	3.39	.33	.79	.84	4.36	3.00
1962	5.48	6.07	4.50	4.85	3.57	3.95	2.92	799	524	324	35.2	7.90	145
1963	7.16	5.62	4.85	3.50	6.84	57.4	478	342	323	9.55	9.19	13.3	105
1964	20.5	7.56	4.86	4.63	4.06	3.73	3.97	3.47	508	67.3	11.8	9.01	53.5
1965	6.69	20.4	26.0	12.6	3.79	5.75	26.8	1,209	540	137	15.7	8.02	169
1966	6.12	5.01	4.38	3.16	110	335	291	190	8.88	7.45	8.57	7.58	81.3
1967	5.58	5.04	4.08	3.44	3.21	3.20	3.39	263	436	11.1	10.2	7.88	63.0
1968	4.13	5.59	3.23	3.04	2.78	4.87	2.55	6.77	7.52	4.97	9.16	8.62	5.27
1969	6.43	4.94	3.33	3.18	2.17	3.36	6.15	491	13.1	9.73	4.66	8.43	47.1
1970	10.7	5.79	3.52	3.53	3.08	3.00	4.64	767	577	9.76	13.9	7.60	118
1971	4.47	5.51	4.33	4.31	90.3	9.89	953	715	530	6.22	8.12	19.6	195
1972	11.4	13.2	4.44	4.55	4.94	973	375	704	983	56.2	17.7	8.65	263
1973	6.98	6.78	5.44	4.44	222	294	633	554	361	19.2	18.9	11.5	177
1974	33.6	9.92	11.3	9.44	8.92	112	544	240	12.1	14.4	20.3	11.2	85.5
1975	10.2	7.81	3.82	3.54	3.84	4.87	6.94	655	153	29.6	10.0	8.00	75.6
1976	5.60	4.17	4.68	6.51	6.03	3.83	4.29	4.54	1,149	218	67.7	9.49	122
1977	7.26	4.87	4.40	3.76	4.09	2.46	6.64	3.13	7.97	11.0	11.3	4.51	5.96
1978	5.74	4.37	4.20	3.79	3.74	130	5.94	1,717	585	13.9	17.1	13.7	211
1979	7.29	3.33	3.68	3.24	4.48	4.73	7.59	133	13.0	9.84	10.8	8.62	17.7
1980	5.43	4.68	4.15	3.15	3.74	4.23	3.08	3.53	11.3	3.38	5.62	5.25	4.79
1981	4.81	4.15	3.77	3.61	3.98	3.02	2.30	6.60	3.51	45.4	8.25	8.30	8.22
1982	5.84	4.85	3.65	2.34	3.09	3.45	4.01	924	181	41.8	10.2	6.25	101
1983	44.1	7.86	6.86	5.26	135	389	428	550	16.4	10.3	15.0	11.4	135
1984	6.26	6.05	3.97	4.14	3.25	3.24	3.77	303	974	16.9	10.4	8.62	111
1985	5.18	4.98	3.29	3.15	2.84	3.37	4.09	3.12	5.90	11.1	8.21	6.17	5.13
1986	5.81	3.62	3.29	3.40	5.84	6.71	7.11	40.8	3.31	8.21	8.65	7.74	8.77
1987	6.63	6.57	3.93	3.32	3.71	4.79	297	163	49.2	7.89	5.19	6.21	46.3
1988	4.44	55.8	3.69	2.80	2.87	4.12	3.97	4.93	10.8	10.1	13.7	10.7	10.6
1989	4.95	4.12	3.50	3.03	3.09	3.86	3.55	3.64	3.89	7.86	11.0	6.58	4.94
1990	4.06	4.12	4.36	4.02	3.39	3.48	3.37	24.7	4.38	8.97	7.36	10.6	6.95
1991	27.5	28.2	4.95	4.31	4.47	3.56	4.51	4.70	5.54	10.2	10.6	11.1	9.99
1992	7.29	6.70	5.40	4.30	5.64	7.11	7.35	7.03	9.36	13.3	10.7	11.8	8.00
1993	8.18	5.15	6.21	7.30	8.29	6.97	9.44	16.0	280	525	88.0	54.4	85.2

Table E40.2. Statistics on mean flow, in cubic feet per second, for station 06436000, Belle Fourche River near Fruitdale (October 1946 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	47	47	47	47	47	47	47	47	47	47	47	47	47
Maximum	556	288	228	108	344	973	953	1,717	1,149	525	142	54.4	369
Percentile													
75th	12.3	13.2	6.21	4.63	6.24	39.4	203	342	361	19.2	13.9	11.1	118
50th	7.16	6.07	4.40	3.76	3.98	4.73	5.16	24.7	13.1	10.3	10.2	8.62	46.3
25th	5.58	4.87	3.77	3.18	3.21	3.48	3.92	4.64	7.47	7.86	8.12	7.58	6.95
Minimum	3.82	3.33	3.23	1.97	1.32	2.46	2.30	3.12	0.33	0.33	0.30	2.24	3.00
Mean	22.32	16.94	10.98	6.73	26.10	100.43	131.49	249.04	208.25	45.27	16.11	10.40	70.43
Standard deviation	80.10	42.14	32.73	15.34	63.96	233.45	242.13	374.83	316.96	96.96	24.05	7.75	81.50
Skewness	80.10	42.14	32.73	15.34	63.96	233.45	242.13	374.83	316.96	96.96	24.05	7.75	1.56
Coefficient of variation	6.71	6.07	6.62	6.54	3.63	2.72	1.91	2.00	1.61	3.54	4.05	4.31	1.16
Percent of annual flow	3.59	2.49	2.98	2.28	2.45	2.32	1.84	1.51	1.52	2.14	1.49	0.75	[1]0.485

[1]Serial correlation for annual mean flows.

Table E40.3. Serial correlation for 1-year lag for monthly mean flow for station 06436000, Belle Fourche River near Fruitdale (October 1946 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.072	0.491	0.235	0.750	0.077	0.377	0.360	0.119	0.117	0.004	-0.092	0.097

Table E40.4. Correlation matrix for monthly mean flow for station 06436000, Belle Fourche River near Fruitdale (October 1946 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.967	0.991	0.983	0.763	0.430	0.459	-0.036	0.353	0.257	0.009	-0.077
Nov.	*	1.000	0.972	0.966	0.738	0.483	0.454	-0.059	0.328	0.252	0.002	-0.041
Dec.	*	*	1.000	0.989	0.750	0.426	0.454	-0.007	0.366	0.279	0.012	-0.069
Jan.	*	*	*	1.000	0.749	0.430	0.460	-0.001	0.403	0.331	0.037	-0.013
Feb.	*	*	*	*	1.000	0.586	0.741	0.087	0.293	0.160	-0.020	0.021
Mar.	*	*	*	*	*	1.000	0.617	0.146	0.324	0.102	-0.048	0.061
Apr.	*	*	*	*	*	*	1.000	0.190	0.278	0.027	-0.077	0.135
May	*	*	*	*	*	*	*	1.000	0.441	0.086	-0.039	0.001
June	*	*	*	*	*	*	*	*	1.000	0.429	0.235	0.073
July	*	*	*	*	*	*	*	*	*	1.000	0.494	0.643
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.422
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E40.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436000, Belle Fourche River near Fruitdale

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1946	2.50	34	4.33	47	5.69	47	7.56	47	13.2	47	73.5	47	156	47	199	47	277	47
1947	.0000	1	.0000	1	.0000	1	2.89	29	5.79	46	8.16	45	11.7	45	15.3	45	18.2	45
1948	.0000	2	.0000	2	2.11	18	3.79	45	4.97	43	11.3	46	25.3	46	30.3	46	28.2	46
1949	2.00	24	2.00	21	2.43	23	3.21	38	5.29	44	6.87	43	8.45	43	9.57	44	11.5	40
1950	1.00	11	1.00	10	1.14	10	1.57	9	2.13	8	2.27	6	2.76	6	3.34	11	6.00	27
1951	2.00	25	2.00	22	2.57	27	2.79	23	2.97	20	3.54	27	4.71	34	5.59	36	7.95	34
1952	3.00	44	3.00	42	3.00	39	3.10	36	3.51	33	4.65	39	4.93	38	5.89	38	8.91	37
1953	3.00	45	3.00	43	3.43	45	3.57	40	4.00	39	4.47	38	4.74	35	5.11	32	8.67	36
1954	.10	7	.10	5	.14	4	.63	4	1.37	4	1.92	4	2.38	4	3.89	22	4.46	15
1955	2.00	26	2.30	28	2.86	36	3.00	32	3.17	27	3.35	20	3.54	20	5.15	33	7.36	32
1956	1.00	12	1.00	11	1.00	9	1.00	5	1.47	5	2.13	5	2.74	5	3.09	5	4.82	20
1957	2.00	27	2.00	23	2.00	17	2.39	15	3.12	24	3.28	18	3.36	15	3.44	13	4.22	12
1958	2.70	40	2.77	40	3.06	42	3.26	39	3.83	37	4.00	32	4.00	27	4.42	29	5.81	26
1959	.0000	3	.033	4	.17	5	.49	3	.74	3	1.66	3	2.25	3	2.83	3	3.17	3
1960	.10	8	.10	6	.10	3	.12	2	.16	1	.24	1	.67	2	1.27	2	2.13	1
1961	.0000	4	.0000	3	.0000	2	.029	1	.19	2	.52	2	.64	1	1.21	1	2.19	2
1962	1.70	20	1.97	20	2.16	20	2.51	16	2.73	14	4.05	33	4.57	31	4.97	31	5.61	24
1963	3.00	46	3.07	45	3.29	43	3.58	41	3.70	35	3.89	30	4.13	30	4.29	27	7.60	33
1964	1.00	13	2.00	24	2.29	21	2.65	19	2.82	18	3.36	21	7.49	42	9.45	43	12.6	42
1965	2.50	35	2.53	32	2.57	28	2.76	22	3.15	25	3.64	28	4.10	29	4.40	28	6.57	30
1966	2.90	43	3.00	44	3.01	40	3.04	34	3.17	28	3.21	14	3.28	14	3.48	14	4.12	11
1967	2.00	28	2.27	26	2.46	24	2.53	17	2.75	15	2.88	11	2.97	10	3.41	12	3.85	6
1968	1.70	21	1.83	17	1.87	15	1.94	13	2.07	7	2.49	7	2.80	7	3.02	4	3.95	10
1969	1.40	17	1.40	14	1.43	12	1.65	10	1.94	6	2.72	9	2.96	9	3.19	8	4.97	22
1970	2.50	36	2.73	39	2.84	35	3.75	43	4.03	40	4.20	34	4.57	32	4.60	30	6.03	28
1971	3.50	47	3.77	46	3.87	46	3.98	46	4.27	41	4.39	37	4.58	33	6.56	40	9.63	38
1972	1.50	18	1.83	18	2.14	19	2.86	28	4.43	42	4.88	40	5.51	39	5.84	37	8.15	35
1973	2.80	42	2.90	41	3.03	41	3.77	44	5.35	45	8.13	44	8.67	44	9.06	42	13.4	44
1974	2.50	37	2.63	35	2.91	37	3.06	35	3.34	31	3.52	26	3.71	25	3.99	25	5.73	25
1975	1.80	23	2.33	29	2.60	29	2.71	20	3.81	36	4.34	36	4.79	36	5.21	34	5.13	23
1976	1.00	14	1.40	15	1.57	14	1.71	11	2.43	11	3.24	15	3.42	18	3.66	18	4.49	16
1977	.010	6	.12	7	.72	7	1.72	12	2.48	12	3.72	29	3.81	26	3.98	24	4.31	14
1978	2.60	38	2.67	36	2.76	33	2.83	26	3.15	26	3.36	22	3.40	16	3.65	16	4.51	18
1979	2.60	39	2.67	37	2.80	34	2.93	30	3.07	22	3.36	23	3.62	23	3.80	20	4.23	13
1980	.81	10	1.00	12	1.27	11	1.46	6	2.18	9	3.29	19	3.52	19	3.58	15	3.89	7
1981	.0000	5	.27	8	.95	8	1.50	7	2.24	10	2.59	8	2.84	8	3.10	6	3.89	8
1982	2.30	32	2.53	33	2.93	38	3.19	37	3.46	32	5.31	42	5.93	41	6.64	41	13.0	43
1983	2.70	41	2.70	38	2.73	32	2.80	24	3.02	21	3.24	16	3.55	21	3.65	17	4.49	17
1984	2.00	29	2.27	27	2.41	22	2.56	18	2.79	16	2.92	12	2.99	11	3.16	7	3.82	5
1985	2.20	31	2.33	30	2.47	25	2.80	25	3.09	23	3.27	17	3.40	17	3.68	19	4.51	19
1986	1.60	19	2.33	31	2.63	30	3.03	33	3.30	30	3.46	25	3.60	22	3.93	23	4.84	21
1987	.22	9	.53	9	.66	6	1.50	8	2.61	13	2.82	10	3.06	12	3.23	9	12.1	41
1988	2.00	30	2.10	25	2.50	26	2.84	27	2.95	19	3.02	13	3.14	13	3.31	10	3.79	4
1989	1.10	15	1.30	13	1.54	13	2.04	14	2.81	17	3.40	24	3.64	24	3.82	21	3.91	9
1990	1.10	16	1.53	16	1.89	16	2.74	21	3.23	29	3.95	31	4.03	28	4.28	26	9.96	39
1991	1.70	22	1.87	19	3.30	44	3.58	42	3.93	38	4.29	35	4.87	37	5.48	35	6.08	29
1992	2.40	33	2.57	34	2.67	31	2.94	31	3.58	34	5.17	41	5.88	40	6.45	39	7.01	31

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E40.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436000, Belle Fourche River near Fruitdale

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1947	6,620	3	5,190	3	3,317	3	2,004	2	1,175	5	793	5	662	4	706	2	540	1
1948	2,100	16	1,927	15	1,827	10	1,151	12	745	13	541	13	397	13	368	10	266	9
1949	2,120	14	1,837	16	1,569	11	1,321	10	1,007	8	761	7	563	7	440	7	294	7
1950	1110	21	990	20	696	22	566	22	342	24	271	22	186	22	143	22	96.9	22
1951	346	32	127	35	62.6	35	35.0	35	21.8	35	15.8	35	15.4	33	13.2	33	9.89	36
1952	945	24	419	26	198	27	97.5	28	51.5	28	29.9	28	22.5	27	20.9	27	17.2	27
1953	1,750	18	981	21	602	23	287	25	147	25	125	25	86.5	25	67.1	25	45.9	25
1954	108	38	65.3	37	34.6	36	23.1	36	18.6	36	15.8	36	12.7	36	10.6	37	8.65	37
1955	363	31	163	34	77.4	34	45.4	34	24.3	34	18.3	33	14.9	34	11.8	35	11.2	32
1956	145	37	59.0	38	28.3	39	17.8	39	16.1	37	13.4	37	12.4	37	10.2	39	7.89	40
1957	77.0	39	39.7	39	31.1	38	21.3	37	15.1	38	13.1	38	11.2	39	10.2	40	8.30	39
1958	52.0	40	33.3	40	20.6	40	14.2	41	12.1	43	11.1	41	10.8	40	10.5	38	8.40	38
1959	13.0	46	12.0	46	11.1	46	10.2	46	9.57	46	8.52	45	7.63	45	6.73	45	5.80	45
1960	662	28	414	27	187	28	90.1	29	47.1	30	25.5	31	18.0	32	14.1	32	10.5	33
1961	7.00	47	7.00	47	6.43	47	5.71	47	4.36	47	4.00	47	3.97	47	3.85	47	3.82	47
1962	3,850	6	3,290	6	3,047	4	1,652	7	1,190	4	790	6	572	6	431	8	284	8
1963	1,490	19	1,400	18	1,156	17	821	16	594	16	429	16	392	15	304	14	203	14
1964	2,590	12	2,393	10	1,339	15	796	17	569	19	289	21	197	21	150	21	99.4	21
1965	5,690	4	4,000	4	2,430	6	1,963	4	1,392	2	910	3	644	5	489	5	325	6
1966	979	23	786	24	586	24	440	23	379	22	332	20	288	18	235	17	156	18
1967	1,240	20	1,110	19	890	19	689	20	441	21	356	19	240	20	182	20	121	20
1968	23.0	43	15.3	45	12.1	45	10.6	45	10.0	45	8.97	44	7.66	44	7.82	43	6.61	42
1969	2,120	15	1,940	14	1,528	12	943	15	508	20	260	23	177	23	134	23	90.1	23
1970	3,050	9	2,410	9	1,994	9	1,395	9	994	9	685	9	460	10	349	12	231	12
1971	2,590	13	1,970	12	1,494	13	1,280	11	1,066	7	920	2	742	2	558	4	381	4
1972	4,840	5	3,833	5	2,428	7	1,493	8	1,083	6	848	4	725	3	780	1	519	2
1973	2,810	11	2,033	11	1,422	14	1,119	13	911	12	658	10	537	8	471	6	344	5
1974	1,110	22	950	22	799	20	748	18	594	17	428	17	304	17	231	18	157	17
1975	1,880	17	1,653	17	1,320	16	984	14	725	14	426	18	286	19	217	19	145	19
1976	9,110	1	5,540	2	3,796	1	2,227	1	1,280	3	710	8	482	9	363	11	240	11
1977	44.0	41	26.0	41	17.3	42	13.9	42	12.9	40	11.4	40	10.3	41	9.03	41	7.47	41
1978	3,400	8	2,680	7	2,471	5	1,999	3	1,929	1	1,180	1	820	1	625	3	416	3
1979	243	33	235	30	227	26	217	26	140	26	76.7	26	54.2	26	43.4	26	30.9	26
1980	187	34	69.2	36	32.5	37	19.5	38	12.2	42	7.46	46	6.74	46	6.48	46	5.35	46
1981	713	27	348	28	155	31	79.4	31	46.9	31	28.1	30	21.1	29	16.8	28	12.5	29
1982	8,320	2	6,133	1	3,654	2	1,903	5	958	11	586	12	394	14	298	15	197	15
1983	869	25	844	23	776	21	671	21	590	18	499	14	460	11	383	9	255	10
1984	3,440	7	2,597	8	2,114	8	1,866	6	976	10	643	11	434	12	328	13	217	13
1985	17.0	45	15.7	44	14.3	44	12.4	44	11.3	44	9.81	43	8.83	42	7.94	42	6.45	43
1986	620	29	337	29	155	30	75.1	32	42.1	32	24.5	32	18.5	31	15.8	31	12.7	28
1987	746	26	633	25	504	25	439	24	363	23	254	24	172	24	131	24	87.6	24
1988	176	36	167	33	167	29	107	27	55.8	27	30.1	27	21.3	28	16.7	29	12.1	31
1989	27.0	42	24.7	42	17.0	43	13.1	43	12.3	41	10.4	42	8.60	43	7.46	44	6.13	44
1990	548	30	227	31	99.4	33	47.8	33	26.6	33	17.1	34	14.0	35	13.1	34	9.96	34
1991	187	35	168	32	146	32	89.9	30	49.5	29	28.5	29	20.5	30	16.5	30	12.2	30
1992	21.0	44	20.0	43	17.7	41	15.5	40	13.8	39	12.3	39	12.0	38	11.4	36	9.93	35
1993	2,980	10	1,947	13	1,081	18	737	19	620	15	439	15	305	16	242	16	163	16

Table E41.1. Mean flow, in cubic feet per second, for station 06436170, Whitewood Creek at Deadwood

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1982	8.57	8.22	6.51	4.80	8.54	12.5	22.4	311	35.7	26.9	16.7	13.6	40.0
1983	44.0	34.7	20.2	17.1	16.0	38.6	101	153	35.2	21.5	24.3	18.2	43.8
1984	16.6	13.8	8.88	13.2	12.4	18.4	40.0	213	102	29.4	19.1	14.7	42.0
1985	13.6	11.5	11.4	10.1	9.40	12.2	20.6	14.7	13.9	10.4	11.8	10.7	12.5
1986	12.5	10.3	8.95	9.95	12.0	20.9	66.6	50.2	41.5	19.0	13.7	16.4	23.5
1987	15.1	13.3	10.7	11.7	11.6	15.9	59.9	34.2	18.9	13.3	13.5	11.7	19.2
1988	11.3	12.6	12.0	11.2	13.4	16.5	29.9	62.1	20.2	14.4	11.5	13.2	19.1
1989	14.3	14.2	12.8	12.5	14.5	17.2	23.6	56.5	21.1	17.7	14.2	14.5	19.5
1990	11.5	12.1	9.57	11.8	12.4	19.0	33.1	47.5	21.0	14.6	12.3	10.4	18.0
1991	11.3	10.7	9.91	10.1	11.4	13.9	23.0	54.4	60.3	14.4	12.5	10.6	20.2
1992	10.7	11.5	10.9	9.31	10.5	14.7	20.2	22.1	17.4	12.9	10.3	9.64	13.3
1993	8.90	9.87	9.10	9.55	9.87	13.7	33.6	76.2	104	30.5	17.7	13.8	28.1

Table E41.2. Statistics on mean flow, in cubic feet per second, for station 06436170, Whitewood Creek at Deadwood (October 1981 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	12	12	12	12	12	12	12	12	12	12	12	12	12
Maximum	44.0	34.7	20.2	17.1	16.0	38.6	101	311	104	30.5	24.3	18.2	43.8
Percentile													
75th	14.9	13.7	11.8	12.3	13.1	18.8	54.9	134	55.6	25.5	17.5	14.6	37.0
50th	12.0	11.8	10.3	10.6	11.8	16.2	31.5	55.4	28.1	16.1	13.6	13.4	19.8
25th	10.9	10.4	8.99	9.65	10.0	13.7	22.5	37.5	19.2	13.6	11.9	10.6	18.3
Minimum	8.57	8.22	6.51	4.80	8.54	12.2	20.2	14.7	13.9	10.4	10.3	9.64	12.5
Mean	14.86	13.57	10.91	10.94	11.83	17.79	39.49	91.24	40.93	18.75	14.80	13.12	24.93
Standard deviation	9.48	6.87	3.37	2.88	2.14	7.08	24.58	89.47	31.81	6.84	4.00	2.62	11.05
Skewness	3.08	3.07	2.00	0.04	0.39	2.63	1.71	1.74	1.41	0.75	1.34	0.47	0.86
Coefficient of variation	0.64	0.51	0.31	0.26	0.18	0.40	0.62	0.98	0.78	0.37	0.27	0.20	0.44
Percent of annual flow	4.98	4.55	3.66	3.67	3.97	5.97	13.24	30.59	13.72	6.29	4.96	4.40	[1]0.472

[1]Serial correlation for annual mean flows.

Table E41.3. Serial correlation for 1-year lag for monthly mean flow for station 06436170, Whitewood Creek at Deadwood (October 1981 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.086	-0.174	-0.547	-0.323	-0.131	-0.197	-0.062	0.483	-0.349	-0.104	0.361	0.047

Table E41.4. Correlation matrix for monthly mean flow for station 06436170, Whitewood Creek at Deadwood (October 1981 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.989	0.891	0.794	0.698	0.938	0.821	0.170	-0.059	0.078	0.740	0.623
Nov.	*	1.000	0.929	0.819	0.748	0.938	0.782	0.124	-0.092	0.050	0.706	0.588
Dec.	*	*	1.000	0.809	0.765	0.817	0.631	-0.169	-0.281	-0.211	0.458	0.435
Jan.	*	*	*	1.000	0.873	0.784	0.654	-0.200	0.021	-0.073	0.477	0.437
Feb.	*	*	*	*	1.000	0.781	0.592	-0.109	-0.132	-0.081	0.386	0.551
Mar.	*	*	*	*	*	1.000	0.880	0.148	-0.043	0.125	0.703	0.707
Apr.	*	*	*	*	*	*	1.000	0.100	0.029	0.156	0.665	0.720
May	*	*	*	*	*	*	*	1.000	0.363	0.732	0.624	0.441
June	*	*	*	*	*	*	*	*	1.000	0.804	0.487	0.289
July	*	*	*	*	*	*	*	*	*	1.000	0.715	0.570
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.787
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E41.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436170, Whitewood Creek at Deadwood

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1982	5.90	2	7.03	2	10.3	9	11.5	11	13.2	11	13.5	11	16.6	11	20.4	11	24.1	11
1983	7.40	5	7.60	4	7.94	3	8.39	3	8.76	2	10.6	7	11.1	7	11.9	9	13.6	10
1984	8.60	10	8.87	9	8.91	6	9.12	6	9.41	6	9.76	4	9.99	3	10.5	4	11.3	5
1985	7.20	4	7.47	3	7.59	2	8.06	2	8.42	1	8.96	1	9.46	2	9.94	2	10.6	3
1986	8.00	7	8.67	8	9.74	8	10.1	8	10.6	8	11.1	8	11.3	8	11.7	7	13.0	9
1987	7.00	3	8.33	6	10.4	11	10.8	10	11.1	9	11.3	9	11.8	9	11.7	8	11.9	6
1988	9.90	11	9.97	11	10.3	10	10.6	9	11.1	10	11.7	10	12.5	10	13.0	10	12.9	8
1989	5.00	1	5.07	1	5.61	1	6.54	1	9.35	5	10.5	6	10.9	6	11.1	6	12.0	7
1990	8.50	9	8.97	10	9.41	7	9.53	7	9.81	7	9.91	5	10.2	4	10.5	5	10.6	4
1991	8.00	8	8.43	7	8.70	5	8.96	5	9.26	4	9.54	3	10.2	5	10.4	3	10.5	2
1992	7.50	6	7.83	5	8.29	4	8.46	4	8.90	3	9.14	2	9.23	1	9.25	1	9.45	1

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E41.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436170, Whitewood Creek at Deadwood

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1982	1,960	1	1,396	1	1,100	1	607	1	321	1	178	1	128	1	102	1	71.9	1
1983	479	4	430	3	328	3	227	3	198	3	131	3	101	3	83.2	3	62.4	3
1984	523	3	519	2	495	2	352	2	219	2	160	2	122	2	98.1	2	70.7	2
1985	31.0	12	30.0	12	28.1	12	24.2	12	20.6	12	17.7	12	16.6	12	15.5	12	14.0	12
1986	169	7	157	7	131	7	99.0	5	77.6	6	60.4	5	53.1	5	45.1	5	35.3	5
1987	136	9	125	8	97.3	9	76.8	9	62.2	8	47.8	7	38.2	7	32.5	8	25.9	8
1988	170	6	162	6	138	6	92.2	7	63.3	7	47.0	8	38.2	8	33.0	7	26.2	7
1989	137	8	119	9	101	8	79.5	8	59.4	9	41.8	9	34.3	10	30.2	10	25.3	9
1990	75.0	10	72.0	10	64.6	10	57.7	10	49.9	10	40.7	10	34.7	9	30.5	9	24.7	10
1991	224	5	203	5	140	5	97.3	6	85.9	5	58.9	6	46.3	6	38.8	6	29.7	6
1992	53.0	11	50.7	11	43.9	11	35.2	11	28.3	11	22.7	11	20.4	11	18.7	11	16.4	11
1993	584	2	413	4	245	4	165	4	105	4	91.3	4	73.0	4	61.8	4	46.5	4

Table E42.1. Mean flow, in cubic feet per second, for station 06436180, Whitewood Creek above Whitewood

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1983	(1)	41.6	20.3	12.5	18.0	47.4	108	150	36.7	23.1	24.9	19.5	(2)
1984	19.5	16.1	10.3	11.9	14.0	20.5	42.4	129	101	31.2	17.5	14.7	35.7
1985	16.5	13.6	12.8	13.0	12.0	16.0	22.2	15.0	13.4	10.6	9.45	11.4	13.8
1986	13.0	9.85	8.84	11.7	14.6	22.3	69.2	50.8	37.7	16.9	16.3	16.5	24.0
1987	16.2	16.4	14.6	12.3	13.1	18.5	48.7	41.4	30.0	19.3	17.2	14.3	21.9
1988	14.8	14.2	13.9	12.1	15.3	22.8	34.8	60.5	24.1	15.4	12.3	15.0	21.3
1989	16.1	15.8	13.6	12.2	13.6	18.7	26.3	59.7	22.0	16.0	12.7	13.2	20.0
1990	13.0	15.8	10.4	13.5	14.5	21.9	35.5	52.7	24.3	18.3	11.7	10.9	20.2
1991	14.2	13.5	7.63	10.6	14.3	18.6	27.4	73.6	55.6	15.6	12.1	11.1	22.9
1992	11.4	14.2	15.6	14.5	14.3	15.5	23.7	28.4	19.1	16.1	12.4	11.5	16.4
1993	11.3	11.4	8.58	7.77	8.57	17.2	44.4	78.0	79.3	31.4	19.8	15.4	27.8

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E42.2. Statistics on mean flow, in cubic feet per second, for station 06436180, Whitewood Creek above Whitewood (October 1983 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	10	10	10	10	10	10	10	10	10	10	10	10	10
Maximum	19.5	16.4	15.6	14.5	15.3	22.8	69.2	129	101	31.4	19.8	16.5	35.7
Percentile													
75th	16.3	15.9	14.1	13.1	14.5	22.0	45.5	74.7	61.5	22.3	17.3	15.1	24.9
50th	14.5	14.2	11.6	12.1	14.1	18.6	35.2	56.2	27.1	16.5	12.5	13.7	21.6
25th	12.6	13.0	8.77	11.4	12.8	16.9	25.6	38.2	21.3	15.5	12.0	11.3	19.1
Minimum	11.3	9.85	7.63	7.77	8.57	15.5	22.2	15.0	13.4	10.6	9.45	10.9	13.8
Mean	14.60	14.08	11.62	11.96	13.43	19.20	37.46	58.91	40.65	19.08	14.14	13.40	22.40
Standard deviation	2.56	2.14	2.82	1.81	1.93	2.59	14.40	31.21	29.02	6.83	3.30	2.05	6.06
Skewness	0.46	-0.93	-0.05	-1.27	-2.05	0.05	1.18	1.07	1.33	1.26	0.45	0.03	1.02
Coefficient of variation	0.18	0.15	0.24	0.15	0.14	0.14	0.38	0.53	0.71	0.36	0.23	0.15	0.27
Percent of annual flow	5.44	5.25	4.33	4.45	5.00	7.15	13.95	21.94	15.14	7.11	5.27	4.99	[1]-0.824

[1]Serial correlation for annual mean flows.

Table E42.3. Serial correlation for 1-year lag for monthly mean flow for station 06436180, Whitewood Creek above Whitewood (October 1983 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.418	-0.176	-0.427	-0.936	-0.331	-0.237	-0.067	-0.738	-0.525	-0.441	-0.303	0.047

Table E42.4. Correlation matrix for monthly mean flow for station 06436180, Whitewood Creek above Whitewood (October 1983 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.570	0.143	0.163	0.213	0.143	-0.080	0.397	0.242	0.084	-0.025	0.074
Nov.	*	1.000	0.517	0.478	0.299	-0.022	-0.463	0.140	-0.097	-0.001	-0.222	-0.410
Dec.	*	*	1.000	0.658	0.232	-0.282	-0.386	-0.505	-0.616	-0.394	-0.322	-0.157
Jan.	*	*	*	1.000	0.678	-0.003	-0.328	-0.472	-0.642	-0.591	-0.638	-0.490
Feb.	*	*	*	*	1.000	0.547	-0.021	-0.020	-0.340	-0.482	-0.469	-0.173
Mar.	*	*	*	*	*	1.000	0.534	0.375	0.093	0.067	0.101	0.430
Apr.	*	*	*	*	*	*	1.000	0.239	0.319	0.373	0.703	0.796
May	*	*	*	*	*	*	*	1.000	0.897	0.786	0.553	0.379
June	*	*	*	*	*	*	*	*	1.000	0.889	0.713	0.404
July	*	*	*	*	*	*	*	*	*	1.000	0.846	0.485
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.755
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E42.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436180, Whitewood Creek above Whitewood

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1983	9.00	10	9.00	9	9.36	7	9.75	7	10.2	6	10.9	5	11.6	5	12.9	7	15.1	10
1984	7.50	5	7.67	5	8.43	5	9.64	6	10.6	7	12.0	7	12.6	7	12.8	5	13.7	6
1985	5.00	1	5.67	4	6.43	4	6.79	4	7.80	3	8.67	2	9.98	2	10.6	2	10.5	2
1986	8.10	7	8.87	8	10.2	9	10.6	9	11.5	9	12.4	9	13.1	9	14.0	10	14.8	9
1987	8.00	6	9.00	10	11.4	10	11.8	10	12.0	10	12.6	10	13.1	10	13.5	8	14.0	7
1988	8.50	9	8.83	7	9.64	8	10.3	8	11.0	8	12.1	8	12.8	8	13.5	9	14.0	8
1989	5.10	3	5.27	2	5.73	3	6.37	3	8.60	4	11.2	6	12.4	6	12.8	6	13.1	5
1990	5.50	4	5.50	3	5.50	1	5.71	1	6.62	2	8.73	3	10.1	3	11.2	3	11.4	3
1991	8.40	8	8.70	6	8.99	6	9.22	5	9.93	5	10.8	4	11.3	4	11.6	4	12.9	4
1992	5.00	2	5.00	1	5.57	2	6.14	2	6.60	1	7.87	1	8.29	1	8.94	1	9.80	1

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E42.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436180, Whitewood Creek above Whitewood

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1984	266	2	252	1	246	1	187	1	132	1	116	1	93.1	1	76.9	1	57.0	1
1985	29.0	10	27.3	10	25.6	10	24.1	10	22.2	10	19.5	10	17.9	10	16.7	10	15.3	10
1986	152	4	146	3	130	3	101	4	79.8	4	60.9	4	52.9	3	45.3	3	35.7	3
1987	82.0	8	78.3	8	67.1	8	58.5	8	51.2	8	46.9	6	40.3	6	35.3	6	29.2	5
1988	136	6	133	5	118	5	86.1	5	61.5	6	48.2	5	41.8	5	36.2	5	29.0	6
1989	141	5	124	6	107	6	82.5	6	62.1	5	44.3	8	36.6	8	32.3	8	26.2	8
1990	83.0	7	80.3	7	73.1	7	64.6	7	56.1	7	44.7	7	38.3	7	33.9	7	28.0	7
1991	185	3	143	4	119	4	110	3	96.0	2	66.5	3	52.8	4	44.7	4	34.3	4
1992	54.0	9	52.7	9	48.7	9	41.3	9	34.4	9	27.3	9	24.4	9	22.0	9	19.5	9
1993	291	1	216	2	150	2	113	2	83.6	3	80.4	2	68.5	2	59.1	2	45.4	2

Table E43.1. Mean flow, in cubic feet per second, for station 06436190, Whitewood Creek near Whitewood

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1982	9.95	11.3	8.89	6.42	12.2	18.5	29.5	258	46.6	25.8	11.2	10.4	37.8
1983	57.8	44.6	26.7	23.9	20.2	35.1	120	136	41.5	22.5	27.0	20.2	48.1
1984	22.1	20.0	11.6	14.3	16.7	22.1	48.9	135	84.2	32.2	18.5	15.3	36.8
1985	20.1	17.7	14.7	15.6	14.7	18.1	21.9	18.7	11.1	4.24	4.74	8.04	14.1
1986	13.3	11.2	10.4	12.5	17.2	25.0	85.8	76.1	44.5	18.5	12.2	24.5	29.2
1987	20.1	18.1	15.5	14.2	14.5	19.4	63.3	45.5	22.9	14.3	11.6	12.2	22.6
1988	14.4	16.2	15.4	15.4	17.8	23.6	32.3	85.7	17.7	20.9	9.50	11.4	23.4
1989	15.9	19.2	12.5	13.3	16.5	23.1	25.3	66.3	21.0	13.3	10.2	10.6	20.6
1990	11.3	18.0	11.3	14.8	17.1	24.3	39.0	48.9	18.6	9.21	7.61	6.70	18.9
1991	11.1	10.9	6.57	5.95	12.6	16.2	26.9	54.0	75.6	14.2	8.89	9.60	21.0
1992	11.7	13.2	12.8	12.0	12.8	17.7	25.3	23.7	17.4	20.4	6.44	7.18	15.1
1993	9.03	10.6	9.21	11.1	11.4	20.8	40.9	87.2	105	36.5	20.9	20.0	31.9

Table E43.2. Statistics on mean flow, in cubic feet per second, for station 06436190, Whitewood Creek near Whitewood (October 1981 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	12	12	12	12	12	12	12	12	12	12	12	12	12
Maximum	57.8	44.6	26.7	23.9	20.2	35.1	120	258	105	36.5	27.0	24.5	48.1
Percentile													
75th	20.1	18.9	15.2	15.2	17.2	24.1	59.7	123	68.3	25.0	16.9	18.8	35.6
50th	13.8	17.0	12.0	13.7	15.6	21.4	35.7	71.2	32.2	19.5	10.7	11.0	23.0
25th	11.1	11.2	9.51	11.3	12.6	18.2	25.7	46.3	17.9	13.5	7.93	8.43	19.3
Minimum	9.03	10.6	6.57	5.95	11.4	16.2	21.9	18.7	11.1	4.24	4.74	6.70	14.1
Mean	18.06	17.58	12.96	13.29	15.31	21.99	46.59	86.26	42.17	19.34	12.40	13.01	26.62
Standard deviation	13.23	9.21	5.11	4.62	2.69	5.02	29.70	65.66	30.76	9.22	6.52	5.75	10.30
Skewness	2.85	2.58	1.82	0.54	0.13	1.64	1.71	1.77	1.01	0.35	1.22	0.91	0.80
Coefficient of variation	0.73	0.52	0.39	0.35	0.18	0.23	0.64	0.76	0.73	0.48	0.53	0.44	0.39
Percent of annual flow	5.66	5.51	4.06	4.17	4.80	6.89	14.61	27.04	13.22	6.06	3.89	4.08	[1]0.378

[1]Serial correlation for annual mean flows.

Table E43.3. Serial correlation for 1-year lag for monthly mean flow for station 06436190, Whitewood Creek near Whitewood (October 1981 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.009	-0.065	-0.264	-0.296	0.027	-0.177	-0.057	0.472	-0.397	-0.024	0.079	-0.173

Table E43.4. Correlation matrix for monthly mean flow for station 06436190, Whitewood Creek near Whitewood (October 1981 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.971	0.910	0.822	0.662	0.789	0.772	0.159	-0.079	0.028	0.666	0.360
Nov.	*	1.000	0.920	0.867	0.725	0.829	0.697	0.128	-0.172	-0.031	0.614	0.235
Dec.	*	*	1.000	0.920	0.693	0.761	0.666	0.002	-0.376	-0.088	0.480	0.218
Jan.	*	*	*	1.000	0.808	0.811	0.642	-0.159	-0.336	-0.107	0.460	0.272
Feb.	*	*	*	*	1.000	0.845	0.620	-0.010	-0.353	-0.191	0.318	0.295
Mar.	*	*	*	*	*	1.000	0.817	0.204	-0.071	0.131	0.681	0.555
Apr.	*	*	*	*	*	*	1.000	0.191	0.099	0.190	0.726	0.751
May	*	*	*	*	*	*	*	1.000	0.337	0.562	0.444	0.250
June	*	*	*	*	*	*	*	*	1.000	0.750	0.584	0.506
July	*	*	*	*	*	*	*	*	*	1.000	0.683	0.535
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.739
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E43.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436190, Whitewood Creek near Whitewood

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1982	6.30	7	6.77	7	7.39	7	7.62	7	8.41	6	10.7	7	14.5	9	21.4	11	29.1	11
1983	10.0	11	10.0	11	10.4	11	11.1	10	11.6	9	12.5	9	13.8	8	15.1	8	17.3	10
1984	7.60	9	8.00	8	9.29	8	11.6	11	13.9	11	14.7	11	15.0	11	15.5	9	16.3	8
1985	2.90	1	3.07	1	3.26	1	3.52	2	3.92	1	4.36	1	5.30	1	6.80	1	8.49	2
1986	9.30	10	9.53	10	9.81	10	10.3	9	11.9	10	14.2	10	14.7	10	15.5	10	17.0	9
1987	7.00	8	8.37	9	9.33	9	9.93	8	11.1	8	11.8	8	12.4	7	12.9	6	13.9	7
1988	4.70	5	5.57	6	6.70	6	6.96	6	7.69	4	9.65	5	12.0	6	13.3	7	13.5	6
1989	5.10	6	5.17	5	5.70	5	6.62	5	9.09	7	10.3	6	10.3	5	11.1	5	12.4	5
1990	3.00	2	3.27	2	3.44	2	3.49	1	4.31	2	6.18	2	7.60	3	8.58	3	8.09	1
1991	3.30	3	5.07	4	5.59	4	6.49	4	7.69	5	8.96	4	9.81	4	10.2	4	11.1	4
1992	4.10	4	4.47	3	4.59	3	4.86	3	6.37	3	6.68	3	7.50	2	8.28	2	8.84	3

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E43.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436190, Whitewood Creek near Whitewood

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1982	1,840	1	998	1	833	1	488	1	269	1	156	1	115	1	92.2	1	66.2	1
1983	420	2	298	3	248	2	222	2	185	2	132	2	101	2	84.1	2	63.7	2
1984	244	5	238	5	229	3	182	3	138	3	112	3	91.2	3	76.0	3	57.1	3
1985	29.0	12	26.3	12	24.7	12	23.3	12	21.9	12	21.1	12	19.7	12	18.6	12	17.4	12
1986	153	7	148	7	142	7	120	7	106	5	81.7	5	70.2	5	58.7	5	44.5	5
1987	110	9	103	9	89.0	9	78.1	9	66.7	9	55.9	8	45.1	8	38.1	8	30.1	8
1988	197	6	195	6	174	6	128	5	87.3	7	60.2	7	49.2	7	41.3	7	33.2	6
1989	147	8	137	8	118	8	93.3	8	68.2	8	47.0	9	39.8	9	34.5	9	28.0	9
1990	79.0	10	74.3	10	67.1	10	59.0	10	54.4	10	44.3	10	37.8	10	33.3	10	27.1	10
1991	360	3	300	2	194	5	122	6	96.1	6	66.9	6	52.6	6	43.9	6	33.1	7
1992	62.0	11	58.3	11	49.9	11	39.5	11	32.2	11	25.0	11	23.2	11	22.0	11	19.6	11
1993	341	4	297	4	204	4	159	4	108	4	96.7	4	79.5	4	68.0	4	52.4	4

Table E44.1. Mean flow, in cubic feet per second, for station 06436198, Whitewood Creek above Vale

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1983	(1)	(1)	27.3	27.5	21.3	52.1	125	156	40.9	22.3	22.2	17.3	(2)
1984	28.3	16.3	11.5	15.9	20.1	30.4	51.1	150	156	35.1	18.1	11.4	45.3
1985	16.5	17.0	10.5	9.88	12.0	21.2	21.0	15.9	8.64	2.12	1.77	4.76	11.8
1986	11.0	9.86	11.8	13.6	24.0	26.2	84.3	67.0	45.5	23.1	10.7	38.9	30.4
1987	23.6	22.2	17.2	17.1	17.4	26.7	76.0	54.0	33.0	17.2	14.9	12.2	27.6
1988	13.9	14.2	13.5	10.5	15.9	25.4	35.4	60.2	17.7	7.27	6.13	8.32	19.0
1989	12.2	14.9	14.2	11.7	13.9	22.6	25.7	68.1	22.6	11.5	5.67	7.94	19.3
1990	9.77	15.4	10.8	16.2	16.8	22.4	35.8	64.5	21.3	10.6	4.28	5.90	19.5
1991	9.82	10.8	8.01	8.15	14.9	20.5	28.5	78.2	64.5	12.7	5.83	7.39	22.4
1992	9.38	13.7	11.5	9.11	10.0	15.4	22.1	23.7	17.7	11.6	5.25	4.09	12.8
1993	9.25	11.1	8.74	9.06	13.4	31.3	46.5	93.7	104	40.4	19.3	13.9	33.4

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E44.2. Statistics on mean flow, in cubic feet per second, for station 06436198, Whitewood Creek above Vale (October 1983 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	10	10	10	10	10	10	10	10	10	10	10	10	10
Maximum	28.3	22.2	17.2	17.1	24.0	31.3	84.3	150	156	40.4	19.3	38.9	45.3
Percentile													
75th	18.3	16.5	13.7	16.0	18.1	27.6	57.3	82.1	74.4	26.1	15.7	12.6	31.2
50th	11.6	14.5	11.5	11.1	15.4	24.0	35.6	65.7	27.8	12.1	5.98	8.13	21.0
25th	9.67	11.0	10.1	9.10	13.0	21.0	24.8	46.4	17.7	9.77	5.01	5.61	17.4
Minimum	9.25	9.86	8.01	8.15	10.0	15.4	21.0	15.9	8.64	2.12	1.77	4.09	11.8
Mean	14.37	14.55	11.77	12.12	15.84	24.21	42.64	67.53	49.09	17.16	9.19	11.48	24.15
Standard deviation	6.61	3.61	2.68	3.33	4.05	4.79	22.14	37.17	47.18	12.23	6.18	10.16	10.22
Skewness	1.44	0.80	0.69	0.43	0.73	-0.19	1.06	0.96	1.61	1.02	0.72	2.60	0.89
Coefficient of variation	0.46	0.25	0.23	0.27	0.26	0.20	0.52	0.55	0.96	0.71	0.67	0.88	0.42
Percent of annual flow	4.96	5.02	4.06	4.18	5.46	8.35	14.71	23.29	16.93	5.92	3.17	3.96	[1]-0.631

[1]Serial correlation for annual mean flows.

Table E44.3. Serial correlation for 1-year lag for monthly mean flow for station 06436198, Whitewood Creek above Vale (October 1983 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.296	-0.386	0.289	-0.084	-0.126	-0.278	0.139	-0.798	-0.482	-0.451	-0.322	-0.108

Table E44.4. Correlation matrix for monthly mean flow for station 06436198, Whitewood Creek above Vale (October 1983 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.701	0.477	0.608	0.348	0.463	0.348	0.438	0.453	0.240	0.464	-0.039
Nov.	*	1.000	0.714	0.593	-0.086	0.049	0.097	-0.146	-0.170	-0.241	0.054	-0.398
Dec.	*	*	1.000	0.575	0.199	0.091	0.389	-0.163	-0.328	-0.210	0.081	0.060
Jan.	*	*	*	1.000	0.642	0.393	0.610	0.330	0.158	0.178	0.332	0.242
Feb.	*	*	*	*	1.000	0.557	0.819	0.518	0.357	0.374	0.404	0.791
Mar.	*	*	*	*	*	1.000	0.603	0.723	0.689	0.773	0.842	0.424
Apr.	*	*	*	*	*	*	1.000	0.305	0.276	0.494	0.627	0.816
May	*	*	*	*	*	*	*	1.000	0.912	0.769	0.714	0.205
June	*	*	*	*	*	*	*	*	1.000	0.872	0.803	0.186
July	*	*	*	*	*	*	*	*	*	1.000	0.932	0.417
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.374
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E44.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436198, Whitewood Creek above Vale

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1983	9.00	10	9.00	10	9.00	10	9.71	10	11.0	10	12.6	9	14.2	9	15.8	9	18.1	9
1984	5.00	7	5.20	7	5.60	7	6.80	7	8.32	7	8.78	7	10.6	7	12.1	7	12.9	7
1985	.0000	1	.14	1	.79	1	1.21	1	1.60	1	1.73	1	2.26	1	4.02	1	6.17	1
1986	6.50	8	6.60	8	7.71	8	8.37	8	10.4	9	15.1	10	17.1	10	18.4	10	20.7	10
1987	8.00	9	8.00	9	8.57	9	9.14	9	9.83	8	11.1	8	12.6	8	12.9	8	13.0	8
1988	2.40	4	2.80	3	3.74	5	4.92	6	5.36	6	5.68	4	6.86	4	8.19	5	10.3	6
1989	2.60	5	3.03	4	4.23	6	4.71	5	5.23	5	6.05	5	7.26	5	8.46	6	10.1	5
1990	1.40	2	1.67	2	2.39	2	2.82	2	3.73	2	5.01	3	6.28	3	7.50	3	7.74	3
1991	2.80	6	3.10	6	3.21	3	3.67	4	4.84	4	6.50	6	7.48	6	8.07	4	9.41	4
1992	2.20	3	3.03	5	3.26	4	3.56	3	4.03	3	4.53	2	5.85	2	7.14	2	7.70	2

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E44.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436198, Whitewood Creek above Vale

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1984	604	1	375	1	311	1	235	1	156	1	155	1	122	1	100	1	73.9	1
1985	55.0	9	39.3	10	31.7	10	26.1	10	22.0	10	21.3	10	19.5	10	18.1	10	15.3	10
1986	390	3	213	3	146	3	117	4	104	4	76.7	3	66.1	3	57.1	3	44.9	3
1987	116	8	111	7	97.6	7	83.9	6	76.0	5	65.3	5	55.8	5	47.8	5	37.5	4
1988	126	7	123	6	111	6	83.6	7	61.2	8	48.3	8	41.4	7	35.7	7	27.6	8
1989	137	6	128	5	117	5	92.9	5	70.7	6	48.7	7	41.0	8	35.4	8	27.8	7
1990	138	5	92.0	8	81.0	8	73.5	8	67.0	7	50.9	6	42.2	6	36.8	6	29.5	6
1991	340	4	212	4	138	4	117	3	108	2	73.7	4	57.7	4	48.5	4	36.5	5
1992	52.0	10	49.3	9	43.7	9	35.4	9	29.2	9	24.1	9	21.4	9	19.8	9	16.8	9
1993	490	2	363	2	233	2	160	2	107	3	99.6	2	83.1	2	71.7	2	55.9	2

Table E45.1. Mean flow, in cubic feet per second, for station 06436700, Indian Creek near Arpan

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1961	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.000	0.29	(2)
1962	0.071	0.000	0.000	0.097	2.00	16.8	0.44	234	94.3	17.9	1.76	.000	30.9
1963	2.94	.097	.010	.035	3.12	6.23	55.8	18.3	126	2.99	.026	12.2	18.8
1964	.000	.000	.000	.000	.000	.12	.097	.016	135	10.3	2.39	.46	12.2
1965	.000	.000	.000	.000	.39	2.45	24.9	102	34.0	29.9	.010	.000	16.3
1966	.000	.000	.000	.000	.000	25.2	2.31	.000	2.66	5.38	.27	3.12	3.28
1967	1.06	.000	.000	1.69	2.11	3.30	1.91	229	319	.055	.013	1.13	46.6
1968	.000	.000	.000	.000	.041	.68	.000	.016	.73	.91	.84	.002	.27
1969	.000	.000	.000	.000	.000	15.0	9.56	15.0	.47	31.3	1.26	.016	6.14
1970	.000	.000	.000	.000	.000	.000	59.6	27.9	6.11	.015	.24	.042	7.79
1971	.000	.000	.000	.000	137	135	40.3	4.03	76.7	.000	1.89	68.7	37.7
1972	164	2.95	1.17	.10	34.4	270	2.14	137	20.8	1.74	20.7	.000	55.2
1973	.032	.027	.030	2.01	3.83	9.96	5.17	4.23	2.45	.52	1.45	.000	2.47
1974	1.89	.097	.000	4.13	3.69	.21	6.11	.19	5.31	2.40	.000	.000	1.98
1975	.000	.000	.000	.000	.000	6.58	98.3	145	46.9	7.34	.13	.000	25.5
1976	.000	.000	.000	.052	.39	.004	.000	.000	341	12.0	.47	.038	29.0
1977	.063	.000	.000	.000	.000	.35	99.3	.002	5.75	1.36	.001	.047	8.79
1978	63.5	.003	.049	.000	.000	434	30.5	248	13.2	153	1.58	.000	80.0
1979	.000	.000	.000	.000	.001	89.8	37.0	.068	.073	5.52	2.22	.018	11.3
1980	.000	.000	.000	.000	.000	.000	.000	.000	1.98	.000	.000	2.81	.39
1981	6.19	.010	.000	.000	.000	.000	.000	.000	6.43	45.6	.91	.000	5.01

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E45.2. Statistics on mean flow, in cubic feet per second, for station 06436700, Indian Creek near Arpan (October 1961 through September 1981)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	20	20	20	20	20	20	20	20	20	20	20	20	20
Maximum	164	2.95	1.17	4.13	137	434	99.3	248	341	153	20.7	68.7	80.0
Percentile													
75th	1.68	0.008	0.000	0.086	2.87	23.1	39.5	128	89.9	16.4	1.71	0.96	30.4
50th	0.000	0.000	0.000	0.000	0.021	4.76	5.64	4.13	9.82	4.18	0.65	0.017	11.7
25th	0.000	0.000	0.000	0.000	0.000	0.14	0.18	0.005	2.50	0.62	0.016	0.000	3.71
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.27
Mean	11.99	0.16	0.06	0.41	9.35	50.78	23.67	58.24	61.94	16.41	1.81	4.43	19.98
Standard deviation	38.46	0.66	0.26	1.04	30.99	111.76	32.20	89.57	101.13	34.55	4.52	15.38	21.30
Skewness	3.72	4.46	4.46	2.93	4.09	2.76	1.42	1.32	2.10	3.60	4.23	4.25	1.48
Coefficient of variation	3.21	4.13	4.14	2.57	3.32	2.20	1.36	1.54	1.63	2.11	2.50	3.47	1.07
Percent of annual flow	5.01	0.07	0.03	0.17	3.91	21.23	9.89	24.34	25.89	6.86	0.76	1.85	[1]-0.143

[1]Serial correlation for annual mean flows.

Table E45.3. Serial correlation for 1-year lag for monthly mean flow for station 06436700, Indian Creek near Arpan (October 1961 through September 1981)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.105	-0.055	-0.037	0.247	0.168	0.107	-0.201	-0.382	-0.100	-0.129	0.028	-0.090

Table E45.4. Correlation matrix for monthly mean flow for station 06436700, Indian Creek near Arpan (October 1961 through September 1981)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.929	0.944	-0.093	0.151	0.731	-0.136	0.375	-0.133	0.252	0.928	-0.091
Nov.	*	1.000	0.998	-0.041	0.187	0.456	-0.156	0.198	-0.097	-0.106	0.980	-0.067
Dec.	*	*	1.000	-0.064	0.186	0.494	-0.157	0.224	-0.103	-0.065	0.984	-0.072
Jan.	*	*	*	1.000	-0.074	-0.161	-0.237	-0.022	0.048	-0.174	-0.106	-0.110
Feb.	*	*	*	*	1.000	0.279	0.074	-0.086	0.018	-0.144	0.241	0.952
Mar.	*	*	*	*	*	1.000	-0.002	0.485	-0.174	0.705	0.517	0.151
Apr.	*	*	*	*	*	*	1.000	0.012	-0.188	-0.037	-0.201	0.146
May	*	*	*	*	*	*	*	1.000	0.245	0.475	0.207	-0.168
June	*	*	*	*	*	*	*	*	1.000	-0.136	-0.111	0.060
July	*	*	*	*	*	*	*	*	*	1.000	-0.053	-0.138
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	-0.021
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E45.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436700, Indian Creek near Arpan

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1962	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.018	17	0.048	17	0.055	16	0.59	13
1963	.0000	2	.0000	2	.0000	2	.0000	2	.0000	2	.0000	1	.0000	1	.0000	1	.0010	7
1964	.0000	3	.0000	3	.0000	3	.0000	3	.0000	3	.0000	2	.0000	2	.0000	2	.14	12
1965	.0000	4	.0000	4	.0000	4	.0000	4	.0000	4	.0000	3	.0000	3	.0000	3	.0000	1
1966	.0000	5	.0000	5	.0000	5	.0000	5	.0000	5	.0000	4	.0000	4	.52	18	1.00	16
1967	.0000	6	.0000	6	.0000	6	.0000	6	.0000	6	.0000	5	.0000	5	.0000	4	.12	11
1968	.0000	7	.0000	7	.0000	7	.0000	7	.0000	7	.0000	6	.0000	6	.0000	5	.0000	2
1969	.0000	8	.0000	8	.0000	8	.0000	8	.0000	8	.0000	7	.0000	7	.0000	6	.0000	3
1970	.0000	9	.0000	9	.0000	9	.0000	9	.0000	9	.0000	8	.0000	8	.0000	7	.021	9
1971	.0000	10	.0000	10	.0000	10	.0000	10	.0000	10	.043	19	1.14	19	2.69	19	30.9	19
1972	.0000	11	.0000	11	.0000	11	.0000	11	.0000	11	.017	16	.012	15	.023	15	1.05	17
1973	.0000	12	.0000	12	.0000	12	.0000	12	.0000	12	.039	18	.060	18	.51	17	.67	14
1974	.0000	13	.0000	13	.0000	13	.0000	13	.0000	13	.0000	9	.0000	9	.0000	8	.0000	4
1975	.0000	14	.0000	14	.0000	14	.0000	14	.0000	14	.0000	10	.0000	10	.0000	9	.021	10
1976	.0000	15	.0000	15	.0000	15	.0000	15	.0000	15	.0000	11	.0000	11	.0000	10	.011	8
1977	.0000	16	.0000	16	.0000	16	.0000	16	.0000	16	.0000	12	.017	16	.013	14	10.8	18
1978	.0000	17	.0000	17	.0000	17	.0000	17	.0000	17	.0000	13	.0000	12	.0000	11	.0000	5
1979	.0000	18	.0000	18	.0000	18	.0000	18	.0000	18	.0000	14	.0000	13	.0000	12	.0000	6
1980	.0000	19	.0000	19	.0000	19	.0000	19	.0000	19	.0000	15	.0000	14	.0000	13	.79	15

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E45.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436700, Indian Creek near Arpan

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1962	1,340	5	898	6	781	4	503	5	306	4	175	4	119	4	91.2	5	61.5	5
1963	1,050	7	720	8	393	8	213	8	126	9	82.4	8	66.9	8	51.6	8	35.8	8
1964	901	10	635	10	365	10	208	9	141	8	73.4	10	49.6	10	37.2	10	24.4	10
1965	1,000	9	567	11	288	11	173	11	124	10	79.3	9	57.8	9	48.8	9	32.5	9
1966	140	16	130	16	78.6	15	46.9	16	27.6	16	14.2	16	9.68	16	7.75	16	6.03	16
1967	1,930	3	1,597	3	935	3	619	3	320	3	278	2	186	2	140	2	92.5	2
1968	11.0	20	7.47	20	4.52	20	2.91	20	1.75	20	1.21	20	.84	20	.64	20	.54	20
1969	185	15	133	15	68.2	16	55.9	15	32.3	15	20.2	15	16.3	15	14.9	14	12.2	14
1970	470	13	384	12	216	13	114	13	79.7	13	45.3	13	31.5	13	23.6	13	15.5	13
1971	1,020	8	756	7	485	7	255	7	197	7	141	6	104	6	96.1	4	63.7	4
1972	1,430	4	1,007	4	748	5	520	4	306	5	157	5	143	3	117	3	79.8	3
1973	49.0	19	39.3	18	23.6	18	12.9	17	11.9	17	8.35	17	6.37	17	6.33	17	4.58	17
1974	74.0	17	48.0	17	26.1	17	12.2	18	6.13	18	3.94	18	4.01	18	3.52	18	3.20	18
1975	1,300	6	900	5	575	6	293	6	225	6	124	7	99.3	7	76.0	7	50.8	7
1976	3,710	1	2,347	1	1,426	1	681	2	346	2	177	3	118	5	88.4	6	58.0	6
1977	854	11	674	9	389	9	197	10	99.4	12	49.8	12	35.1	12	26.6	12	17.5	12
1978	2,450	2	1,937	2	1,377	2	891	1	467	1	344	1	247	1	214	1	149	1
1979	407	14	339	13	243	12	172	12	117	11	64.9	11	43.3	11	32.5	11	22.6	11
1980	56.0	18	27.6	19	12.1	19	5.63	19	2.81	19	1.41	19	.94	19	1.20	19	.79	19
1981	574	12	312	14	144	14	92.7	14	47.5	14	27.2	14	18.2	14	13.6	15	8.94	15

Table E46.1. Mean flow, in cubic feet per second, for station 06436760, Horse Creek above Vale

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1981	10.9	2.20	3.00	2.52	3.86	1.70	.96	6.48	35.4	90.3	39.8	45.5	20.3
1982	3.58	3.01	2.54	1.04	8.61	22.4	21.6	901	206	65.5	59.5	47.9	113
1983	169	9.85	8.50	31.7	34.2	37.7	13.8	7.48	37.4	67.5	63.8	39.6	43.7
1984	11.2	5.33	2.05	5.39	10.2	7.29	19.3	239	252	65.2	67.6	59.5	62.1
1985	7.31	3.98	2.77	2.86	4.41	120	6.60	20.8	35.4	77.6	66.4	32.4	32.1
1986	3.37	2.27	2.63	2.73	9.34	251	163	349	21.6	68.7	57.5	311	104
1987	44.0	12.4	7.23	3.66	13.5	62.8	229	36.0	30.8	79.9	82.6	60.2	55.2
1988	10.2	3.38	2.62	1.85	2.40	4.54	2.44	20.8	65.7	70.1	65.5	39.9	24.2
1989	3.62	2.50	2.12	2.12	2.05	12.4	50.1	111	26.7	43.2	44.8	21.4	27.1
1990	3.74	3.54	3.23	6.43	11.0	17.9	2.23	23.8	20.0	46.1	30.7	17.0	15.6
1991	1.56	1.82	1.30	2.67	2.65	2.31	2.79	17.1	11.3	35.8	38.0	21.8	11.7
1992	1.46	3.09	1.53	.96	1.24	1.30	.75	9.66	16.1	51.1	25.7	11.3	10.4
1993	2.48	2.22	1.15	1.06	2.80	127	47.5	139	106	464	65.7	35.0	83.8

Table E46.2. Statistics on mean flow, in cubic feet per second, for station 06436760, Horse Creek above Vale (October 1980 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	13	13	13	13	13	13	13	13	13	13	13	13	13
Maximum	169	12.4	8.50	31.7	34.2	251	229	901	252	464	82.6	311	113
Percentile													
75th	11.0	4.65	3.11	4.52	10.6	91.4	48.8	189	85.8	78.7	66.0	53.7	72.9
50th	3.74	3.09	2.62	2.67	4.41	17.9	13.8	23.8	35.4	67.5	59.5	39.6	32.1
25th	2.92	2.24	1.79	1.45	2.53	3.42	2.34	13.4	20.8	48.6	38.9	21.6	17.9
Minimum	1.46	1.82	1.15	0.96	1.24	1.30	0.75	6.48	11.3	35.8	25.7	11.3	10.4
Mean	20.96	4.28	3.13	5.00	8.17	51.41	43.08	144.70	66.49	94.23	54.43	57.12	46.40
Standard deviation	45.87	3.22	2.21	8.19	8.81	73.93	71.15	250.56	76.83	112.19	16.95	77.80	34.98
Skewness	3.27	1.95	1.85	3.37	2.39	1.96	2.11	2.66	1.84	3.48	-0.31	3.36	0.89
Coefficient of variation	2.19	0.75	0.71	1.64	1.08	1.44	1.65	1.73	1.16	1.19	0.31	1.36	0.75
Percent of annual flow	3.79	0.77	0.57	0.90	1.48	9.30	7.79	26.17	12.02	17.04	9.84	10.33	[1]-0.046

[1]Serial correlation for annual mean flows.

Table E46.3. Serial correlation for 1-year lag for monthly mean flow for station 06436760, Horse Creek above Vale (October 1980 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.103	-0.101	-0.109	-0.061	0.112	0.304	0.269	-0.303	-0.161	-0.168	0.418	0.010

Table E46.4. Correlation matrix for monthly mean flow for station 06436760, Horse Creek above Vale (October 1980 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.703	0.862	0.963	0.925	-0.061	0.049	-0.204	-0.119	-0.092	0.308	-0.068
Nov.	*	1.000	0.900	0.567	0.719	-0.053	0.510	-0.191	-0.017	-0.141	0.588	-0.080
Dec.	*	*	1.000	0.761	0.863	0.000	0.394	-0.184	-0.200	-0.212	0.445	0.013
Jan.	*	*	*	1.000	0.931	-0.073	-0.107	-0.209	-0.098	-0.134	0.162	-0.062
Feb.	*	*	*	*	1.000	0.054	0.159	-0.003	0.030	-0.155	0.336	0.102
Mar.	*	*	*	*	*	1.000	0.557	0.169	-0.153	0.342	0.357	0.810
Apr.	*	*	*	*	*	*	1.000	0.097	-0.152	0.058	0.516	0.578
May	*	*	*	*	*	*	*	1.000	0.652	0.000	0.189	0.303
June	*	*	*	*	*	*	*	*	1.000	0.174	0.390	-0.056
July	*	*	*	*	*	*	*	*	*	1.000	0.277	-0.051
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.209
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E46.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436760, Horse Creek above Vale

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1981	0.60	6	0.65	5	0.71	5	0.80	3	0.86	2	1.43	4	1.85	4	2.20	5	4.83	6
1982	2.10	12	2.13	12	2.43	12	3.18	12	5.14	12	8.14	12	13.3	12	18.8	12	49.0	12
1983	.40	4	.49	4	.61	3	.96	5	1.89	6	3.25	10	4.12	10	4.53	10	6.89	7
1984	1.90	11	2.10	11	2.19	11	2.46	11	2.64	9	2.75	8	3.00	8	3.31	8	9.01	9
1985	.070	1	.47	3	.72	6	1.18	7	2.21	8	2.38	7	2.45	7	2.45	7	9.51	10
1986	1.00	8	1.33	8	1.94	10	2.30	9	3.64	11	4.10	11	6.77	11	8.78	11	24.5	11
1987	.48	5	.78	7	.82	7	1.05	6	1.70	5	1.95	5	2.26	6	2.42	6	4.18	5
1988	1.60	10	1.67	9	1.71	8	1.85	8	1.96	7	2.03	6	2.06	5	2.15	4	3.02	3
1989	1.50	9	1.67	10	1.86	9	2.31	10	2.75	10	3.16	9	3.41	9	3.90	9	7.58	8
1990	.15	2	.23	1	.28	1	.30	1	.97	4	1.40	3	1.51	3	1.68	2	2.04	2
1991	.60	7	.67	6	.71	4	.87	4	.91	3	1.02	1	1.17	1	1.25	1	1.59	1
1992	.19	3	.27	2	.31	2	.43	2	.66	1	1.09	2	1.44	2	1.68	3	3.47	4

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E46.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436760, Horse Creek above Vale

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1981	535	9	366	9	207	9	156	9	94.0	9	74.4	8	62.0	10	54.1	10	36.6	10
1982	14,000	1	6,470	1	3,477	1	1,822	1	1,060	1	570	1	409	1	321	1	220	1
1983	1,470	5	1,186	5	632	6	314	6	173	6	92.2	6	64.3	9	56.2	9	48.8	8
1984	1,570	4	1,238	4	841	3	473	4	253	4	249	4	187	4	158	4	117	4
1985	1,100	7	767	7	463	8	241	8	127	8	73.4	9	65.3	8	57.5	8	59.4	6
1986	5,640	2	3,025	2	1,451	2	790	2	487	2	275	3	262	2	201	3	162	2
1987	1,450	6	1,133	6	814	4	441	5	232	5	147	5	111	5	94.1	5	88.9	5
1988	206	11	166	11	122	11	93.3	10	77.2	10	70.8	10	68.2	7	64.2	7	44.2	9
1989	840	8	735	8	573	7	300	7	153	7	87.9	7	72.2	6	65.1	6	51.3	7
1990	181	12	113	12	69.3	12	56.9	12	47.5	12	39.1	12	36.1	11	33.1	11	24.1	11
1991	74.0	13	50.3	13	47.0	13	41.1	13	39.0	13	38.0	13	33.9	12	28.7	12	21.3	12
1992	315	10	246	10	145	10	78.1	11	54.9	11	40.6	11	31.7	13	28.6	13	19.3	13
1993	1,990	3	1,469	3	751	5	557	3	478	3	312	2	253	3	202	2	161	3

Table E47.1. Mean flow, in cubic feet per second, for station 06436800, Horse Creek near Vale

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1962	(1)	(1)	(1)	(1)	(1)	(1)	1.11	484	205	57.3	58.2	52.8	(2)
1963	31.2	4.31	3.04	1.43	4.73	24.0	60.6	40.1	213	80.8	87.4	63.5	51.2
1964	33.1	5.05	3.26	3.08	2.79	7.22	5.48	8.42	286	111	115	61.9	53.4
1965	27.8	4.47	4.74	4.27	4.98	5.50	36.2	278	63.2	106	93.3	77.5	59.3
1966	16.1	4.23	4.84	2.16	3.18	54.7	18.9	10.1	92.2	88.5	88.0	67.4	37.7
1967	16.2	5.81	4.37	7.79	25.6	25.2	13.3	283	465	99.2	132	103	98.4
1968	17.4	6.85	10.3	4.50	6.59	16.1	5.50	27.2	41.0	85.4	84.2	75.9	31.9
1969	14.6	6.45	4.20	2.85	1.87	15.8	51.1	60.2	45.8	104	116	79.0	42.0
1970	19.3	4.43	3.26	1.36	4.77	8.08	76.2	68.5	46.2	102	107	62.8	42.2
1971	9.67	5.68	3.91	3.47	36.6	215	62.9	27.7	147	105	149	176	78.6
1972	244	10.3	6.27	3.42	35.8	264	9.52	108	120	100	123	83.6	93.0
1973	15.6	7.76	3.41	4.95	6.78	40.6	19.3	33.7	49.2	122	91.5	40.8	36.6
1974	15.7	5.95	2.53	5.80	6.55	4.93	12.3	13.4	66.7	123	110	63.3	36.0
1975	4.97	4.54	2.37	2.24	3.64	22.5	173	167	55.8	92.0	129	76.6	61.5
1976	13.2	3.76	2.57	2.67	12.9	7.71	4.07	18.8	680	185	223	111	105
1977	7.70	3.24	4.21	2.65	5.48	7.83	122	44.1	95.7	117	127	26.6	47.2
1978	84.2	6.18	4.51	3.79	4.29	628	42.1	299	47.2	262	123	108	136
1979	15.0	4.03	3.24	.86	1.49	24.4	72.4	26.1	143	121	121	122	54.7
1980	14.8	4.50	3.50	2.85	2.43	4.93	3.48	51.0	52.9	88.8	82.5	7.46	26.8

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E47.2. Statistics on mean flow, in cubic feet per second, for station 06436800, Horse Creek near Vale (October 1962 through September 1980)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	18	18	18	18	18	18	18	18	18	18	18	18	18
Maximum	244	10.3	10.3	7.79	36.6	628	173	299	680	262	223	176	136
Percentile													
75th	28.6	6.25	4.57	4.33	8.31	44.1	65.3	123	163	121	127	104	82.2
50th	15.9	4.80	3.70	2.96	4.87	19.3	27.7	42.1	79.4	104	115	76.2	52.3
25th	14.2	4.29	3.19	2.22	3.08	7.59	8.51	24.3	48.7	91.2	90.6	62.6	37.4
Minimum	4.97	3.24	2.37	0.86	1.49	4.93	3.48	8.42	41.0	80.8	82.5	7.46	26.8
Mean	33.36	5.42	4.14	3.34	9.47	76.47	43.80	86.91	150.55	116.26	116.77	78.13	60.64
Standard deviation	55.37	1.70	1.82	1.69	11.17	155.83	45.95	99.67	170.96	43.09	32.69	37.75	29.87
Skewness	3.65	1.48	2.49	1.03	1.89	3.04	1.59	1.46	2.29	2.71	2.06	0.67	1.21
Coefficient of variation	1.66	0.31	0.44	0.51	1.18	2.04	1.05	1.15	1.14	0.37	0.28	0.48	0.49
Percent of annual flow	4.60	0.75	0.57	0.46	1.31	10.55	6.04	11.99	20.78	16.04	16.11	10.78	[1]-0.190

[1]Serial correlation for annual mean flows.

Table E47.3. Serial correlation for 1-year lag for monthly mean flow for station 06436800, Horse Creek near Vale (October 1962 through September 1980)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.138	0.400	0.141	0.033	0.299	-0.040	-0.296	-0.457	-0.164	0.039	0.114	-0.273

Table E47.4. Correlation matrix for monthly mean flow for station 06436800, Horse Creek near Vale (October 1962 through September 1980)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.724	0.303	0.027	0.508	0.532	-0.241	0.209	-0.074	0.137	0.011	0.071
Nov.	*	1.000	0.454	0.427	0.520	0.394	-0.389	0.108	-0.221	0.004	-0.153	0.092
Dec.	*	*	1.000	0.241	0.187	0.153	-0.315	0.067	-0.244	-0.157	-0.317	0.028
Jan.	*	*	*	1.000	0.365	0.069	-0.444	0.422	0.162	0.069	-0.018	0.049
Feb.	*	*	*	*	1.000	0.294	-0.182	0.127	0.299	-0.073	0.384	0.556
Mar.	*	*	*	*	*	1.000	-0.047	0.460	-0.165	0.713	0.114	0.396
Apr.	*	*	*	*	*	*	1.000	0.116	-0.293	-0.098	0.071	0.036
May	*	*	*	*	*	*	*	1.000	-0.003	0.353	0.001	0.178
June	*	*	*	*	*	*	*	*	1.000	0.208	0.749	0.324
July	*	*	*	*	*	*	*	*	*	1.000	0.468	0.290
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.541
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E47.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436800, Horse Creek near Vale

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1962	0.20	2	0.20	2	0.30	2	0.60	3	0.84	2	1.83	2	2.47	3	3.02	3	11.9	12
1963	2.00	13	2.17	14	2.29	13	2.49	12	2.75	12	2.80	9	2.93	7	3.24	5	9.18	10
1964	.40	5	.47	5	.84	5	2.67	13	3.78	16	4.23	16	4.42	14	4.52	12	9.12	9
1965	.50	6	.83	6	1.14	7	1.36	5	2.00	7	2.66	8	3.33	10	3.52	9	13.3	13
1966	1.80	12	1.93	12	2.39	14	3.12	17	4.37	18	4.75	18	5.06	16	7.04	17	14.3	15
1967	1.00	7	1.07	8	1.21	8	1.51	6	2.54	10	4.47	17	6.65	18	6.82	16	10.4	11
1968	1.50	9	1.60	9	1.63	9	1.76	7	1.81	5	2.08	3	2.56	4	3.37	7	7.64	8
1969	.20	3	.23	3	.30	3	.41	2	.90	3	2.24	5	2.87	6	3.34	6	7.29	7
1970	2.40	16	2.60	17	2.84	17	3.04	15	3.20	14	3.41	12	3.85	11	4.38	11	16.9	16
1971	2.20	15	2.27	15	2.53	15	3.10	16	3.33	15	3.86	14	5.64	17	7.07	18	78.6	18
1972	2.50	17	2.50	16	2.56	16	2.69	14	3.19	13	4.10	15	4.86	15	5.59	15	13.6	14
1973	.30	4	.43	4	.46	4	.63	4	1.25	4	2.92	10	4.11	13	4.91	14	7.13	6
1974	1.00	8	1.00	7	1.10	6	1.76	8	1.90	6	2.14	4	2.40	2	2.99	2	6.18	3
1975	1.50	10	1.70	10	1.96	10	2.01	9	2.18	8	2.36	6	2.93	8	3.45	8	7.09	5
1976	2.00	14	2.00	13	2.14	12	2.43	11	2.60	11	3.32	11	3.28	9	3.78	10	5.32	1
1977	3.00	18	3.10	18	3.50	18	3.68	18	3.78	17	3.82	13	4.09	12	4.68	13	19.2	17
1978	.0000	1	.0000	1	.0000	1	.0000	1	.76	1	1.14	1	1.60	1	2.07	1	7.02	4
1979	1.50	11	1.70	11	2.06	11	2.21	10	2.38	9	2.60	7	2.81	5	3.18	4	5.54	2

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E47.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06436800, Horse Creek near Vale

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1963	1,300	6	898	8	530	8	330	7	219	9	152	9	134	9	112	10	90.6	10
1964	1,290	7	968	6	565	7	329	8	311	5	203	4	172	4	144	5	97.6	9
1965	2,030	3	1,637	3	855	4	464	5	313	4	190	5	160	5	143	6	110	7
1966	230	16	179	16	136	18	119	17	105	17	92.0	17	90.7	16	84.5	15	61.9	15
1967	1,490	5	1,300	5	914	3	769	3	468	3	379	3	291	3	249	3	182	3
1968	232	15	211	15	175	15	135	16	108	16	98.2	16	83.4	17	72.5	17	53.4	17
1969	299	12	257	12	200	12	151	13	133	11	123	12	101	13	87.0	14	76.3	13
1970	495	11	427	11	255	11	141	14	126	14	111	14	92.3	14	88.7	13	77.3	12
1971	859	10	787	9	522	9	332	6	238	8	189	6	153	6	147	4	138	4
1972	1,950	4	1,623	4	848	5	465	4	297	6	156	8	135	8	130	7	125	5
1973	250	14	212	14	189	14	158	12	128	13	108	15	92.0	15	81.9	16	61.4	16
1974	176	18	165	18	155	16	138	15	124	15	118	13	107	12	94.0	12	65.0	14
1975	1,180	8	899	7	579	6	313	9	259	7	174	7	135	7	128	8	116	6
1976	6,660	1	3,920	1	2,593	1	1,288	2	684	1	466	1	369	1	302	1	203	2
1977	971	9	763	10	455	10	232	10	130	12	123	11	114	11	103	11	88.9	11
1978	3,120	2	2,877	2	2,028	2	1,297	1	681	2	452	2	335	2	298	2	246	1
1979	291	13	256	13	194	13	159	11	148	10	134	10	129	10	127	9	102	8
1980	216	17	175	17	141	17	118	18	102	18	88.2	18	81.5	18	70.9	18	48.2	18

Table E48.1. Mean flow, in cubic feet per second, for station 06437000, Belle Fourche River near Sturgis

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	(1)	(1)	26.5	25.0	52.0	117	241	1,951	3,404	670	267	636	(2)
1947	787	325	252	169	712	1,464	1,238	370	2,168	477	261	241	702
1948	95.9	90.6	44.8	25.2	96.7	730	511	316	793	434	298	295	311
1949	157	145	56.0	28.0	117	1,873	1049	328	344	286	254	232	408
1950	89.0	84.1	25.0	5.39	11.1	37.2	1,243	663	248	262	267	261	266
1951	92.5	48.9	26.1	20.5	17.1	75.6	45.3	87.3	245	181	200	222	105
1952	105	77.6	42.6	22.1	169	515	399	269	251	261	248	189	212
1953	81.2	54.2	39.2	39.5	28.9	154	78.5	369	830	258	436	270	220
1954	125	100	45.1	21.9	91.9	55.4	227	265	232	188	243	224	152
1955	90.7	67.6	52.3	33.4	26.8	105	157	97.9	178	241	182	203	120
1956	75.5	46.1	21.9	20.3	29.7	207	63.0	85.5	194	312	159	120	112
1957	66.8	95.6	44.7	21.8	32.0	50.5	59.7	176	91.9	159	202	142	95.7
1958	72.2	57.8	39.4	30.6	51.1	61.9	86.1	59.6	397	292	242	189	132
1959	73.3	60.2	46.1	12.0	24.7	140	62.3	69.6	118	137	70.5	35.6	71.2
1960	33.0	20.1	33.0	14.0	19.9	365	53.1	57.7	84.5	52.4	103	33.0	73.0
1961	30.5	36.2	14.6	14.6	12.1	30.3	21.9	15.8	80.7	58.9	2.39	10.2	27.4
1962	16.2	26.7	11.5	5.71	46.6	123	38.5	1,915	1,466	671	200	177	394
1963	147	58.2	35.3	22.4	123	148	727	584	1,026	293	255	244	304
1964	126	61.5	24.9	22.8	26.8	44.7	76.6	147	1,301	454	330	217	235
1965	113	55.7	40.2	43.5	38.2	45.2	153	2,340	882	469	307	255	399
1966	96.4	57.7	61.0	27.7	109	530	437	281	250	250	265	199	214
1967	93.0	50.9	53.4	34.7	48.9	75.9	118	1,022	1,411	310	339	324	324
1968	82.5	44.3	29.0	26.9	36.6	93.5	62.1	150	233	268	273	225	127
1969	69.6	71.6	32.9	18.1	12.8	237	278	826	248	344	300	269	227
1970	102	44.4	34.7	10.2	19.3	49.9	326	1,041	921	322	348	261	291
1971	72.8	59.4	29.5	22.7	511	446	1,134	1,112	911	288	367	406	444
1972	393	111	61.6	35.4	243	1,503	474	1,105	1,685	428	428	303	565
1973	96.1	54.8	32.1	28.3	209	497	788	962	789	383	481	216	378
1974	123	70.8	29.2	25.4	72.7	159	559	353	260	340	354	245	216
1975	58.8	47.7	28.1	23.5	23.6	150	601	1,193	454	336	402	303	303
1976	97.4	50.1	41.0	47.9	68.4	178	84.1	129	2,499	800	625	349	412
1977	69.5	49.6	40.8	20.0	43.4	77.8	518	212	286	299	374	115	176
1978	178	55.1	59.4	29.5	37.4	1,715	270	2,304	788	526	405	348	566
1979	119	48.3	31.4	4.71	6.62	200	234	221	411	320	470	329	201
1980	99.8	57.8	50.0	20.9	21.7	55.6	51.9	112	249	256	172	39.7	99.2
1981	37.0	27.5	24.4	32.8	65.5	32.8	21.2	66.5	336	396	177	244	122
1982	51.5	57.8	25.0	6.28	28.0	159	157	3,478	911	327	327	284	489
1983	529	89.3	66.2	137	302	514	674	813	289	342	401	277	370
1984	80.1	53.8	22.2	21.3	63.2	61.9	91.4	992	2,225	377	356	322	387
1985	73.0	52.7	33.4	27.2	54.9	431	57.3	192	204	286	294	163	157
1986	51.3	42.2	40.1	46.9	148	627	583	688	207	320	302	723	315
1987	198	90.0	79.5	57.2	62.7	265	795	472	232	322	320	198	258
1988	69.8	73.6	29.6	10.5	19.4	177	71.5	163	267	277	256	171	133
1989	43.8	44.0	29.0	28.3	27.5	86.5	125	265	151	174	188	111	107
1990	41.1	55.8	53.1	76.6	95.2	75.3	55.4	154	92.0	192	132	112	94.7
1991	38.6	60.7	15.4	18.4	28.7	66.3	72.2	255	134	146	155	124	93.4
1992	43.9	75.8	36.0	28.1	31.8	44.5	39.5	64.2	95.5	177	123	97.1	71.5
1993	36.5	29.8	27.9	30.7	36.1	573	214	628	550	1,473	347	250	353

[1]Indicates a no-value month.

[2]Incomplete water year.

Table E48.2. Statistics on mean flow, in cubic feet per second, for station 06437000, Belle Fourche River near Sturgis (October 1946 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	47	47	47	47	47	47	47	47	47	47	47	47	47
Maximum	787	325	252	169	712	1,873	1,243	3,478	2,499	1,473	625	723	702
Percentile													
75th	113	73.6	46.1	32.8	95.2	446	518	826	882	377	354	277	370
50th	82.5	57.7	35.3	25.2	38.2	150	157	281	286	299	273	225	220
25th	58.8	48.3	28.1	20.0	26.8	61.9	62.3	147	207	250	200	163	120
Minimum	16.2	20.1	11.5	4.71	6.62	30.3	21.2	15.8	80.7	52.4	2.39	10.2	27.4
Mean	115.35	66.76	42.35	31.27	87.26	325.66	322.99	584.45	596.14	335.43	281.72	224.84	251.77
Standard deviation	132.49	44.85	34.33	29.39	129.63	447.35	345.90	705.85	606.41	217.63	117.06	116.40	153.34
Skewness	3.80	4.40	5.14	3.39	3.44	2.33	1.34	2.30	1.67	3.39	0.23	1.42	0.82
Coefficient of variation	1.15	0.67	0.81	0.94	1.49	1.37	1.07	1.21	1.02	0.65	0.42	0.52	0.61
Percent of annual flow	3.83	2.21	1.41	1.04	2.89	10.80	10.72	19.39	19.78	11.13	9.35	7.46	[1]0.333

[1]Serial correlation for annual mean flows.

Table E48.3. Serial correlation for 1-year lag for monthly mean flow for station 06437000, Belle Fourche River near Sturgis (October 1946 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.037	0.254	0.031	-0.113	0.172	0.142	0.313	-0.051	0.078	-0.003	0.583	0.161

Table E48.4. Correlation matrix for monthly mean flow for station 06437000, Belle Fourche River near Sturgis (October 1946 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.823	0.849	0.831	0.753	0.556	0.509	0.045	0.389	0.099	0.227	0.141
Nov.	*	1.000	0.895	0.671	0.714	0.549	0.559	-0.070	0.301	-0.012	0.028	0.042
Dec.	*	*	1.000	0.803	0.727	0.519	0.461	-0.053	0.329	0.063	0.058	0.060
Jan.	*	*	*	1.000	0.703	0.360	0.364	-0.058	0.265	0.134	0.135	0.149
Feb.	*	*	*	*	1.000	0.504	0.652	0.053	0.389	0.086	0.185	0.274
Mar.	*	*	*	*	*	1.000	0.491	0.186	0.239	0.235	0.235	0.287
Apr.	*	*	*	*	*	*	1.000	0.115	0.137	0.052	0.305	0.365
May	*	*	*	*	*	*	*	1.000	0.349	0.265	0.334	0.373
June	*	*	*	*	*	*	*	*	1.000	0.454	0.543	0.368
July	*	*	*	*	*	*	*	*	*	1.000	0.471	0.315
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.620
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E48.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06437000, Belle Fourche River near Sturgis

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1946	50.0	47	56.7	47	66.4	47	93.9	47	120	47	160	47	211	47	267	47	398	47
1947	5.00	10	5.00	9	5.00	7	13.6	18	18.8	17	28.5	31	44.3	36	51.9	39	85.6	38
1948	13.0	25	13.7	24	14.1	22	16.9	24	26.6	34	36.2	38	55.5	44	77.9	45	132	44
1949	.0000	1	.0000	1	.0000	1	2.29	2	3.27	2	7.05	3	9.97	2	15.6	2	41.1	9
1950	5.00	11	5.00	10	5.00	8	6.43	8	11.8	11	17.8	11	20.9	11	23.4	6	48.2	12
1951	5.00	12	5.00	11	7.86	14	9.29	15	12.2	13	25.3	20	47.0	39	54.7	42	75.5	35
1952	10.0	19	10.0	19	10.7	18	15.7	21	26.0	33	33.1	35	34.7	29	38.8	27	66.7	29
1953	5.00	13	5.00	12	6.43	11	8.21	11	21.3	25	31.8	34	50.0	42	52.4	40	73.7	32
1954	20.0	39	20.0	38	23.6	37	24.3	34	25.7	31	28.0	28	35.4	30	42.7	30	63.9	27
1955	15.0	27	16.7	30	18.6	31	18.9	28	19.8	21	21.1	15	22.0	12	29.1	12	60.1	24
1956	15.0	28	15.0	27	17.9	30	18.6	27	19.5	20	26.7	25	31.1	21	37.1	22	52.5	20
1957	10.0	20	10.0	20	12.1	20	15.7	22	23.3	27	25.9	23	33.9	27	39.1	28	52.7	21
1958	8.00	16	8.00	16	8.57	16	9.07	14	11.4	10	18.2	12	26.4	15	35.6	21	60.6	25
1959	8.00	17	9.33	18	10.7	19	11.4	17	12.9	14	16.7	10	17.5	5	20.7	5	24.5	3
1960	2.00	3	2.67	4	3.86	5	4.57	5	7.70	5	13.4	6	13.6	4	17.9	3	23.1	2
1961	.0000	2	.30	2	.56	2	.99	1	2.17	1	6.12	2	8.95	1	13.3	1	11.9	1
1962	10.0	21	13.3	23	16.1	26	17.4	25	21.8	26	28.0	29	37.9	32	50.5	37	85.0	37
1963	8.00	18	8.00	17	9.14	17	10.6	16	20.9	24	21.1	16	23.8	13	29.0	11	51.3	18
1964	15.0	29	20.0	39	24.3	40	26.8	40	35.0	43	36.9	39	39.5	33	41.0	29	57.5	23
1965	10.0	22	11.7	21	15.0	25	18.9	29	26.7	35	42.7	43	47.8	40	51.2	38	92.4	40
1966	20.0	40	21.3	41	24.1	39	26.1	38	28.2	38	37.9	40	45.1	37	46.8	34	60.7	26
1967	10.0	23	12.0	22	13.9	21	14.6	19	19.0	18	25.8	22	28.2	18	33.8	18	52.3	19
1968	6.00	14	6.67	14	7.50	13	8.25	12	10.0	8	14.6	8	18.2	6	28.8	10	50.4	15
1969	6.00	15	6.67	15	7.86	15	8.14	10	9.33	7	13.6	7	19.2	8	24.4	7	45.0	11
1970	15.0	30	15.0	28	17.1	27	19.4	31	20.3	23	23.2	18	31.8	23	38.7	26	111	41
1971	18.0	35	19.3	35	22.9	36	24.5	36	28.9	39	35.7	37	54.9	43	69.7	43	199	45
1972	17.0	34	17.3	31	17.4	29	18.9	30	25.9	32	29.6	33	35.7	31	44.6	33	119	42
1973	3.00	6	3.67	6	5.29	9	6.79	9	17.8	15	25.5	21	34.2	28	47.6	35	75.2	34
1974	12.0	24	14.0	25	14.9	23	15.5	20	19.3	19	20.8	14	23.9	14	30.4	15	50.0	13
1975	15.0	31	18.3	32	22.1	35	30.0	42	33.5	41	38.9	41	45.5	38	50.4	36	80.7	36
1976	15.0	32	15.0	29	17.1	28	17.9	26	19.8	22	28.7	32	32.6	25	38.1	25	50.9	16
1977	25.0	44	25.0	43	25.0	42	28.2	41	29.0	40	33.3	36	39.5	34	44.3	32	70.3	31
1978	2.00	4	2.00	3	2.21	3	3.07	3	4.58	3	5.66	1	12.4	3	20.1	4	69.7	30
1979	13.0	26	14.3	26	14.9	24	16.4	23	18.5	16	21.2	17	28.3	19	35.1	20	51.2	17
1980	18.0	36	18.7	33	20.7	33	22.6	33	23.9	29	25.2	19	27.5	17	29.6	13	36.2	5
1981	3.60	7	3.90	7	4.07	6	4.24	4	6.04	4	10.8	4	19.3	9	28.5	9	38.9	7
1982	40.0	46	48.7	46	51.1	46	56.4	46	62.8	46	69.6	46	94.0	46	117	46	226	46
1983	4.50	9	5.07	13	6.89	12	8.94	13	12.1	12	20.3	13	31.3	22	37.5	23	50.3	14
1984	18.0	37	19.7	37	21.9	34	24.4	35	25.6	30	26.9	26	32.7	26	37.8	24	86.3	39
1985	23.0	43	23.3	42	24.4	41	32.0	44	36.2	44	39.7	42	42.3	35	44.1	31	74.3	33
1986	20.0	41	26.7	45	40.7	45	45.5	45	55.7	45	59.5	45	66.2	45	72.1	44	128	43
1987	2.90	5	2.97	5	3.50	4	4.86	6	8.42	6	11.9	5	18.9	7	32.8	17	53.7	22
1988	18.0	38	19.3	36	19.7	32	21.4	32	23.3	28	26.1	24	27.4	16	29.6	14	35.6	4
1989	25.0	45	26.0	44	28.3	44	31.2	43	34.7	42	47.1	44	48.8	41	53.7	41	65.6	28
1990	4.00	8	4.83	8	5.79	10	5.89	7	10.6	9	16.5	9	20.1	10	25.5	8	37.7	6
1991	20.0	42	21.0	40	23.7	38	26.5	39	27.6	37	28.2	30	31.8	24	34.9	19	43.3	10
1992	15.0	33	18.7	34	25.3	43	25.7	37	26.7	36	27.1	27	28.9	20	30.8	16	39.8	8

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E48.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06437000, Belle Fourche River near Sturgis

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1947	13,400	3	11,190	3	7,000	3	3,931	4	2,303	6	1,462	8	1,251	6	1,373	1	1,074	1
1948	3,820	19	2,843	20	2,085	19	1,427	21	917	23	720	20	591	21	636	17	530	16
1949	5,000	13	4,500	11	4,000	8	2,999	8	2,136	8	1,485	7	1,105	8	912	10	692	10
1950	4,000	18	3,407	15	2,327	16	2,160	11	1,254	15	964	15	724	17	610	18	490	19
1951	1,010	39	696	41	498	40	322	41	251	41	225	39	224	38	212	36	163	39
1952	5,620	11	4,770	10	3,140	9	1,688	13	901	24	568	25	457	25	419	25	350	26
1953	4,720	16	3,183	18	2,767	13	1,507	18	926	22	663	22	535	22	474	22	373	24
1954	2,460	26	1,741	28	904	32	587	34	396	34	280	34	272	33	266	33	230	31
1955	762	42	518	44	377	44	283	43	249	42	214	41	211	40	202	39	176	37
1956	1,650	32	1,291	32	728	34	450	36	331	36	262	36	230	37	203	38	174	38
1957	848	41	709	40	480	41	306	42	218	43	200	43	170	43	171	42	139	42
1958	1,340	34	1,015	34	713	35	652	32	401	32	348	31	312	31	282	31	211	33
1959	478	46	328	46	233	46	176	46	150	46	133	46	116	46	101	46	100	45
1960	2,500	25	1,933	27	1,313	27	744	29	400	33	220	40	178	42	147	44	122	44
1961	392	47	290	47	172	47	130	47	116	47	70.7	47	52.7	47	45.1	47	36.5	47
1962	8,090	5	6,060	5	5,597	4	4,061	3	2,894	2	1,927	2	1,408	3	1,104	5	757	5
1963	3,090	23	2,260	24	1,744	23	1,474	19	1,033	19	872	18	783	15	662	16	523	17
1964	6,740	6	5,077	7	2,795	11	1,571	16	1,506	10	891	17	701	18	578	20	419	21
1965	9,890	4	6,743	4	4,271	7	3,853	5	2,650	4	1,706	4	1,265	5	1,024	7	739	8
1966	1,800	31	1,347	31	1,091	29	796	27	658	26	534	26	435	26	387	26	337	27
1967	4,990	14	3,840	13	2,784	12	2,176	10	1,411	12	1,240	11	932	12	781	11	587	13
1968	618	44	593	42	502	39	379	39	324	37	293	33	265	35	255	35	202	35
1969	2,940	24	2,623	23	2,044	20	1,415	22	929	21	621	24	501	24	452	24	400	23
1970	4,190	17	2,940	19	2,243	17	1,629	14	1,256	14	1,048	14	804	14	697	14	537	15
1971	3,500	22	2,833	21	1,830	21	1,560	17	1,287	13	1,261	10	1,087	10	923	9	747	6
1972	5,510	12	4,260	12	2,803	10	2,321	9	1,686	9	1,407	9	1,100	9	1,202	4	949	3
1973	3,580	20	2,797	22	1,824	22	1,414	23	1,165	17	1,056	13	859	13	768	13	653	11
1974	1,030	38	914	36	760	33	748	28	617	27	467	27	401	28	382	28	364	25
1975	3,570	21	3,337	16	2,729	14	1,807	12	1,243	16	944	16	780	16	666	15	550	14
1976	15,900	2	1,2740	2	8,796	2	4,664	2	2,730	3	1,754	3	1,335	4	1,077	6	744	7
1977	2,410	27	2,117	25	1,425	26	841	26	535	28	382	29	348	29	335	29	303	29
1978	6,570	7	5,887	6	4,597	5	3,121	7	2,493	5	1,587	6	1,632	2	1,342	2	1,028	2
1979	932	40	838	37	675	36	595	33	483	29	417	28	402	27	384	27	331	28
1980	643	43	587	43	399	43	338	40	283	40	256	37	234	36	201	40	151	40
1981	2,220	30	1,741	29	1,043	30	678	31	428	31	372	30	330	30	293	30	207	34
1982	29,700	1	19,030	1	11,650	1	6,933	1	3,959	1	2,295	1	1,651	1	1,315	3	934	4
1983	4,840	15	3,230	17	1,722	24	985	25	937	20	752	19	673	19	589	19	509	18
1984	5,910	10	4,920	8	4,594	6	3,807	6	2,263	7	1,615	5	1,204	7	994	8	725	9
1985	2,340	29	1,687	30	1,150	28	724	30	446	30	310	32	272	32	272	32	254	30
1986	6,520	8	4,790	9	2,433	15	1,429	20	1,082	18	667	21	672	20	551	21	470	20
1987	2,410	28	2,117	26	1,637	25	1,131	24	799	25	637	23	529	23	458	23	404	22
1988	1,140	36	730	38	537	38	385	38	319	38	274	35	267	34	257	34	218	32
1989	1,310	35	1,125	33	935	31	573	35	332	35	233	38	213	39	206	37	178	36
1990	519	45	381	45	333	45	246	45	196	44	170	44	158	44	152	43	124	43
1991	1,650	33	979	35	629	37	427	37	303	39	208	42	191	41	182	41	148	41
1992	1,090	37	711	39	438	42	260	44	189	45	157	45	138	45	130	45	99.7	46
1993	6,070	9	3,610	14	2,220	18	1,576	15	1,495	11	1,099	12	934	11	768	12	651	12

Table E49.1. Mean flow, in cubic feet per second, for station 06437500, Bear Butte Creek near Sturgis

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1946	3.00	5.30	5.68	4.84	4.68	4.86	14.0	339	330	35.2	7.28	23.4	64.9
1947	39.0	19.8	14.1	18.6	55.2	72.5	58.1	25.2	133	26.2	4.35	2.47	38.7
1948	5.14	8.53	7.19	6.68	10.1	16.7	10.6	8.39	19.7	3.54	2.27	.55	8.26
1949	1.46	3.74	2.07	1.18	2.02	32.3	35.0	25.4	7.61	1.27	.11	.24	9.40
1950	2.78	2.84	2.74	1.50	2.14	3.00	53.7	28.8	4.88	1.62	.20	.20	8.68
1951	1.27	1.99	2.26	1.90	3.09	3.14	2.36	6.31	4.77	1.66	5.52	9.07	3.61
1952	2.63	2.13	2.00	2.19	12.4	36.7	9.64	49.7	7.62	1.51	.34	.047	10.6
1953	1.07	.53	1.00	1.79	1.84	3.84	4.16	69.1	31.3	4.08	7.95	.15	10.7
1954	.74	1.73	1.98	1.98	2.62	2.53	10.6	6.01	14.9	.89	.000	.000	3.64
1955	.22	.73	1.03	.98	.80	1.75	12.2	1.08	14.1	.006	.000	.000	2.72
1956	.000	.000	.000	.53	.73	3.56	1.88	1.66	.21	.000	.000	.000	.72
1957	.000	1.73	.65	.35	1.52	1.29	2.31	34.2	14.7	4.10	.000	.000	5.10
1958	.000	.000	.45	.58	.55	1.00	3.50	1.06	.67	1.92	.000	.000	.81
1959	.000	.000	.000	.055	.089	3.37	.64	.11	.000	2.84	.000	.000	.60
1960	.000	.000	.000	.000	.000	12.7	.29	.000	.000	.000	.000	.000	1.10
1961	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1962	.000	.000	.000	.000	.000	3.92	.000	108	220	27.2	2.76	.000	30.1
1963	.73	1.49	1.82	1.34	11.2	12.9	58.4	66.1	63.9	11.0	.84	.36	19.1
1964	.50	1.32	1.18	1.61	2.66	3.35	3.85	13.3	137	8.27	1.02	.80	14.4
1965	1.54	1.73	1.70	1.82	2.77	3.28	4.36	199	54.1	15.5	3.00	2.86	24.6
1966	4.50	5.50	5.13	3.08	2.96	26.1	29.6	16.7	4.34	.71	4.54	1.02	8.72
1967	1.71	2.78	2.57	3.46	6.04	7.08	12.9	85.4	134	15.0	3.60	1.82	23.0
1968	3.02	6.30	3.50	5.25	4.83	6.15	6.36	3.94	9.19	2.85	.71	.69	4.38
1969	1.84	1.01	1.02	.97	1.03	15.0	25.7	62.8	6.03	2.16	.40	.18	9.94
1970	1.22	1.38	.68	.76	.82	1.43	27.2	93.9	73.2	4.74	.21	.25	17.2
1971	.65	1.03	.82	3.36	38.7	12.0	49.9	133	57.4	6.16	.97	.98	25.3
1972	4.15	6.23	5.43	5.02	16.0	10.7	12.2	45.2	226	22.4	6.15	2.42	29.9

Table E49.2. Statistics on mean flow, in cubic feet per second, for station 06437500, Bear Butte Creek near Sturgis (October 1945 through September 1972)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	27	27	27	27	27	27	27	27	27	27	27	27	27
Maximum	39.0	19.8	14.1	18.6	55.2	72.5	58.4	339	330	35.2	7.95	23.4	64.9
Percentile													
75th	2.78	3.74	2.74	3.36	6.04	12.9	27.2	69.1	73.2	11.0	3.60	1.02	23.0
50th	1.22	1.73	1.70	1.61	2.62	3.92	10.6	25.4	14.7	2.85	0.71	0.24	9.40
25th	0.000	0.53	0.65	0.58	0.80	3.00	2.36	3.94	4.77	1.27	0.000	0.000	3.61
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mean	2.86	2.88	2.41	2.59	6.84	11.15	16.65	52.72	58.10	7.44	1.93	1.76	13.93
Standard deviation	7.37	4.08	3.03	3.66	12.49	15.54	18.89	75.05	85.40	9.75	2.49	4.70	14.71
Skewness	4.87	3.01	2.53	3.46	3.05	2.77	1.26	2.55	1.88	1.63	1.19	4.19	1.85
Coefficient of variation	2.58	1.42	1.26	1.42	1.83	1.39	1.13	1.42	1.47	1.31	1.29	2.67	1.06
Percent of annual flow	1.71	1.72	1.44	1.55	4.09	6.67	9.95	31.51	34.72	4.45	1.16	1.05	[1]0.559

[1]Serial correlation for annual mean flows.

Table E49.3. Serial correlation for 1-year lag for monthly mean flow for station 06437500, Bear Butte Creek near Sturgis (October 1945 through September 1972)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.116	0.452	0.559	0.420	0.124	-0.015	0.045	-0.031	0.250	0.352	0.096	0.140

Table E49.4. Correlation matrix for monthly mean flow for station 06437500, Bear Butte Creek near Sturgis (October 1945 through September 1972)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.915	0.875	0.937	0.788	0.831	0.472	-0.041	0.210	0.412	0.278	0.080
Nov.	*	1.000	0.979	0.967	0.721	0.780	0.444	0.012	0.284	0.440	0.370	0.198
Dec.	*	*	1.000	0.951	0.691	0.739	0.441	0.091	0.350	0.489	0.473	0.304
Jan.	*	*	*	1.000	0.823	0.761	0.436	0.066	0.321	0.483	0.401	0.210
Feb.	*	*	*	*	1.000	0.724	0.606	0.090	0.239	0.385	0.212	0.042
Mar.	*	*	*	*	*	1.000	0.526	-0.098	0.046	0.217	0.137	-0.046
Apr.	*	*	*	*	*	*	1.000	0.102	0.041	0.134	-0.029	-0.038
May	*	*	*	*	*	*	*	1.000	0.681	0.694	0.464	0.723
June	*	*	*	*	*	*	*	*	1.000	0.934	0.580	0.625
July	*	*	*	*	*	*	*	*	*	1.000	0.597	0.588
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.589
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E49.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06437500, Bear Butte Creek near Sturgis

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1946	1.00	25	1.00	25	1.00	25	1.50	25	5.89	26	14.7	26	16.9	26	19.8	26	20.3	26
1947	1.70	26	1.77	26	1.87	26	2.00	26	2.35	25	2.86	25	3.91	25	4.91	25	5.69	25
1948	.40	21	.40	21	.40	21	.40	20	.44	17	.73	18	1.39	19	1.85	19	1.72	19
1949	.0000	1	.0000	1	.0000	1	.043	15	.090	11	.17	10	.37	11	1.05	17	1.63	18
1950	.0000	2	.0000	2	.0000	2	.029	14	.10	12	.19	11	.47	13	.79	13	1.25	14
1951	.30	20	.30	20	.30	20	.31	18	.66	20	1.99	23	2.11	22	2.14	21	3.79	22
1952	.0000	3	.0000	3	.0000	3	.0000	1	.047	10	.16	9	.37	9	.50	10	.73	10
1953	.0000	4	.0000	4	.0000	4	.043	16	.14	15	.35	16	.69	16	1.00	16	1.40	16
1954	.0000	5	.0000	5	.0000	5	.0000	2	.0000	1	.0000	1	.0000	1	.19	8	.42	8
1955	.0000	6	.0000	6	.0000	6	.0000	3	.0000	2	.0000	2	.0000	2	.0000	1	.0000	1
1956	.0000	7	.0000	7	.0000	7	.0000	4	.0000	3	.0000	3	.0000	3	.0000	2	.17	7
1957	.0000	8	.0000	8	.0000	8	.0000	5	.0000	4	.0000	4	.0000	4	.0000	3	.12	6
1958	.0000	9	.0000	9	.0000	9	.0000	6	.0000	5	.0000	5	.0000	5	.0000	4	.009	5
1959	.0000	10	.0000	10	.0000	10	.0000	7	.0000	6	.0000	6	.0000	6	.0000	5	.0000	2
1960	.0000	11	.0000	11	.0000	11	.0000	8	.0000	7	.0000	7	.0000	7	.0000	6	.0000	3
1961	.0000	12	.0000	12	.0000	12	.0000	9	.0000	8	.0000	8	.0000	8	.0000	7	.0000	4
1962	.0000	13	.0000	13	.0000	13	.0000	10	.0000	9	.21	13	.48	14	.80	14	1.26	15
1963	.0000	14	.0000	14	.0000	14	.0000	11	.13	14	.23	14	.44	12	.65	11	.93	12
1964	.50	23	.60	23	.70	23	.76	22	.79	22	.88	19	1.11	18	1.26	18	1.43	17
1965	.0000	15	.0000	15	.0000	15	1.07	24	2.04	24	2.46	24	3.08	24	3.74	24	3.91	24
1966	.40	22	.40	22	.41	22	.46	21	.52	19	1.21	21	1.53	20	1.86	20	2.21	20
1967	.68	24	.73	24	.86	24	.88	23	1.43	23	1.87	22	2.70	23	3.50	23	3.85	23
1968	.0000	16	.0000	16	.047	18	.19	17	.45	18	.67	17	.99	17	1.00	15	1.04	13
1969	.0000	17	.0000	17	.0000	16	.0000	12	.18	16	.26	15	.56	15	.75	12	.76	11
1970	.0000	18	.0000	18	.0000	17	.0000	13	.11	13	.21	12	.37	10	.50	9	.64	9
1971	.0000	19	.0000	19	.10	19	.37	19	.66	21	.90	20	1.78	21	2.70	22	3.70	21

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E49.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06437500, Bear Butte Creek near Sturgis

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1946	4,650	1	1,810	1	865	1	703	1	528	1	340	1	238	1	182	1	125	1
1947	1,030	6	834	5	481	5	262	5	145	6	80.8	8	72.8	7	76.9	4	61.3	2
1948	221	15	110	16	60.7	18	34.3	18	19.7	18	14.6	18	13.4	18	14.0	18	12.0	17
1949	181	17	79.3	19	66.0	17	61.9	16	48.7	15	35.3	15	31.5	14	25.5	14	17.3	14
1950	235	14	182	13	118	14	86.6	14	54.0	14	41.6	13	29.6	15	22.8	15	15.6	15
1951	111	19	64.7	20	42.6	21	21.8	22	13.7	21	7.38	21	5.94	22	6.44	21	5.17	21
1952	543	9	335	10	191	11	104	12	55.3	13	38.5	14	34.5	13	27.8	13	19.8	12
1953	294	12	152	15	95.7	15	88.5	13	70.5	12	51.2	11	35.8	12	29.1	11	20.3	11
1954	79.0	21	54.0	22	40.4	22	26.1	21	17.1	19	10.9	19	10.5	19	8.57	19	6.40	19
1955	75.0	23	63.3	21	46.1	20	27.2	19	14.1	20	7.66	20	9.19	20	7.30	20	5.10	22
1956	12.0	26	10.0	26	6.66	26	3.82	26	3.66	25	2.76	24	2.39	24	2.02	24	1.43	25
1957	236	13	190	12	123	13	75.2	15	44.4	16	26.9	17	18.2	17	14.3	17	9.75	18
1958	20.0	25	16.0	25	9.64	25	5.65	25	3.81	24	2.52	25	2.00	25	1.87	25	1.47	24
1959	78.0	22	29.3	24	12.6	24	5.87	24	3.49	26	2.07	26	1.44	26	1.09	26	1.20	26
1960	111	20	87.3	18	50.9	19	26.4	20	13.4	22	6.68	23	4.46	23	3.34	23	2.19	23
1961	.0000	27	.0000	27	.0000	27	.0000	27	.0000	27	.0000	27	.0000	27	.0000	27	.0000	27
1962	4,150	2	1,647	2	796	2	395	3	309	2	177	2	121	2	90.6	2	60.1	3
1963	472	10	340	9	249	9	157	9	99.7	10	79.1	9	63.8	9	51.5	8	37.1	8
1964	1,360	5	824	6	430	6	242	6	140	7	77.4	10	53.1	10	40.8	10	27.8	10
1965	1,870	4	1,020	4	528	4	380	4	222	4	132	4	92.0	4	69.9	5	47.0	6
1966	133	18	104	17	72.4	16	46.7	17	39.3	17	32.6	16	25.3	16	19.6	16	14.1	16
1967	897	7	546	7	382	7	238	7	134	8	112	6	80.2	6	62.6	7	43.3	7
1968	40.0	24	32.0	23	19.0	23	11.8	23	9.80	23	6.70	22	6.51	21	6.41	22	6.07	20
1969	393	11	267	11	197	10	129	11	75.9	11	49.2	12	36.3	11	28.3	12	18.9	13
1970	220	16	173	14	166	12	139	10	107	9	93.2	7	66.3	8	50.6	9	33.5	9
1971	601	8	462	8	259	8	208	8	149	5	114	5	81.5	5	67.3	6	49.5	5
1972	2,940	3	1,348	3	657	3	399	2	230	3	137	3	98.8	3	77.0	3	55.1	4

Table E50.1. Mean flow, in cubic feet per second, for station 06438000, Belle Fourche River near Elm Springs

Water year	Month												Annual
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	
1928	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	571	(2)
1929	330	188	(1)	(1)	(1)	(1)	3,684	2,334	3,413	419	348	554	(2)
1930	349	115	(1)	(1)	(1)	688	193	378	868	407	386	282	(2)
1931	188	63.7	(1)	(1)	(1)	66.3	133	147	189	301	81.4	32.8	(2)
1932	164	62.3	(1)	(1)	(1)	305	1,352	985	1,101	(1)	(1)	(1)	(2)
1934	(1)	(1)	(1)	(1)	(1)	(1)	81.2	73.3	187	140	99.7	78.4	(2)
1935	165	70.6	42.7	18.0	85.3	141	101	117	970	113	104	87.5	167
1936	63.3	62.6	37.9	18.9	4.53	497	223	90.2	69.7	91.1	2.34	.22	97.3
1937	29.3	42.3	14.4	4.10	7.29	119	234	29.3	728	2,415	135	193	332
1938	67.5	45.7	26.5	32.8	54.5	150	45.1	195	465	152	75.9	104	118
1939	66.3	43.9	35.5	17.5	4.86	278	61.1	51.8	79.7	70.4	22.1	19.5	63.2
1940	72.2	62.8	34.5	2.03	6.28	128	184	65.5	490	98.9	54.5	56.6	104
1941	50.0	38.1	14.8	10.5	31.1	61.7	611	111	5,231	199	217	243	562
1942	92.4	96.7	43.1	17.3	16.0	39.2	230	3,026	1,541	494	281	194	510
1943	67.1	75.8	37.5	33.9	1,026	1,254	555	136	1,196	476	198	183	431
1944	74.3	91.7	48.7	23.4	16.5	601	3,603	451	4,541	532	302	238	868
1945	138	104	80.2	139	293	3,175	370	321	1,095	329	239	247	547
1946	90.9	112	33.7	24.0	49.2	114	244	3,031	5,074	832	238	689	877
1947	901	468	312	196	768	1,582	1,389	398	2,768	500	248	269	812
1948	120	107	80.0	50.0	136	1,052	527	303	940	389	338	237	357
1949	156	149	88.4	30.2	73.2	3,292	1,837	387	384	273	215	227	596
1950	98.7	72.2	22.2	9.13	26.6	166	2,182	993	248	258	339	268	390
1951	103	62.2	35.3	27.6	22.9	115	55.5	92.0	325	191	205	245	123
1952	126	71.5	54.7	18.2	322	1,025	1,248	402	285	279	240	206	356
1953	76.7	53.8	42.9	39.2	34.8	293	187	687	1,314	328	511	257	319
1954	123	96.5	41.3	16.0	96.2	47.7	457	312	643	169	229	211	203
1955	94.2	69.5	52.4	29.7	27.0	158	184	96.5	221	253	158	225	131
1956	77.2	34.2	20.0	25.2	22.6	568	76.6	99.5	186	306	161	112	142
1957	64.6	110	36.9	16.0	35.2	71.1	78.2	486	166	140	207	130	129
1958	76.7	58.4	40.2	33.1	66.4	69.0	148	67.9	780	327	240	183	174
1959	67.9	57.1	48.1	12.5	25.8	154	74.0	62.8	111	125	58.8	29.4	69.3
1960	27.4	14.8	37.8	12.3	27.9	512	64.4	77.8	85.5	34.0	97.7	23.8	85.4
1961	18.5	28.2	6.84	13.3	17.2	45.3	23.1	13.6	76.1	95.1	.77	2.65	28.4
1962	13.9	22.0	2.45	.23	55.3	154	43.8	4,683	2,647	608	221	169	724
1963	136	57.5	44.3	29.8	134	278	856	750	1,422	293	236	247	373
1964	123	58.1	14.2	38.0	36.8	61.3	86.8	165	2,857	451	298	213	364
1965	125	46.7	30.9	43.7	45.2	54.2	196	3,428	998	504	316	228	506
1966	66.3	56.1	52.0	30.8	42.7	876	657	329	252	230	279	228	259
1967	111	56.3	54.0	35.3	58.6	181	195	1,740	2,503	347	356	308	496
1968	71.5	60.9	44.9	31.5	52.2	105	80.9	132	293	273	278	240	139
1969	75.7	54.8	32.6	2.87	2.45	313	411	897	224	424	278	240	248
1970	120	54.7	33.5	8.89	22.8	58.0	844	1,276	989	296	331	261	359
1971	78.1	54.7	27.7	11.3	484	1,303	1,427	1,659	1,311	281	410	442	623
1972	451	80.3	42.3	20.4	285	1,716	507	1,319	1,975	488	392	287	631
1973	110	55.4	25.2	27.6	240	569	952	1,082	776	392	559	231	419
1974	138	72.4	37.3	25.2	89.1	171	667	351	239	337	360	242	228
1975	57.9	57.7	25.7	13.4	5.45	194	1,584	1,679	531	342	387	285	432
1976	103	33.8	48.8	41.9	87.1	178	105	129	2,985	787	634	357	455
1977	85.2	47.8	34.5	19.2	50.2	74.0	841	235	282	288	343	150	204
1978	262	58.5	58.7	33.3	35.8	2,457	338	2,594	898	563	405	356	680
1979	98.4	38.8	19.8	5.00	3.96	309	333	233	446	384	430	343	222
1980	152	56.7	39.5	11.3	20.6	69.8	63.7	97.3	388	206	149	54.4	109
1981	60.4	33.5	27.6	55.5	54.0	29.7	13.4	62.0	400	560	223	254	148
1982	52.0	42.9	20.6	4.10	35.4	323	267	3901	942	352	313	285	551
1983	732	106	65.6	112	321	581	728	932	318	326	395	280	409
1984	107	41.4	20.4	18.5	94.0	75.5	136	1481	2,768	382	385	338	486
1985	75.5	69.8	41.3	43.7	22.6	399	70.5	168	201	289	281	185	155
1986	49.5	37.5	35.5	50.9	459	1,237	1,185	1,378	275	311	274	768	505
1987	253	102	102	78.6	70.2	339	1,135	859	281	307	265	149	330
1988	63.5	72.1	31.4	10.2	18.0	231	97.4	203	281	312	253	159	145
1989	48.4	42.0	24.6	13.0	10.3	96.8	125	294	118	144	167	107	99.9
1990	35.4	55.6	42.6	72.0	80.5	90.7	51.1	170	76.1	171	109	98.7	88.0
1991	30.9	62.9	14.9	.016	.45	65.5	122	634	225	130	142	113	129
1992	39.5	58.6	34.3	20.3	26.5	33.7	31.5	46.1	103	244	65.2	61.0	63.8
1993	27.6	27.8	13.9	12.0	14.5	982	388	1269	819	1,791	355	244	501

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E50.2. Statistics on mean flow, in cubic feet per second, for station 06438000, Belle Fourche River near Elm Springs (October 1934 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	59	59	59	59	59	59	59	59	59	59	59	59	59
Maximum	901	468	312	196	1,026	3,292	3,603	4,683	5,231	2,415	634	768	877
Percentile													
75th	123	72.2	44.9	33.9	87.1	569	667	1,082	1,196	424	339	261	501
50th	77.2	57.7	36.9	20.4	36.8	178	230	321	465	307	248	228	330
25th	63.3	43.9	25.7	12.3	20.6	75.5	80.9	111	239	199	161	130	131
Minimum	13.9	14.8	2.45	0.016	0.45	29.7	13.4	13.6	69.7	34.0	0.77	0.22	28.4
Mean	119.66	69.05	42.57	30.35	106.00	496.83	500.51	784.38	997.22	377.67	254.34	217.01	333.45
Standard deviation	148.53	58.63	40.32	33.12	185.39	715.09	646.77	1044.62	1217.67	369.22	131.49	136.18	221.69
Skewness	4.02	5.63	5.36	3.12	3.30	2.51	2.57	2.05	2.06	3.97	0.30	1.63	0.65
Coefficient of variation	1.24	0.85	0.95	1.09	1.75	1.44	1.29	1.33	1.22	0.98	0.52	0.63	0.66
Percent of annual flow	2.99	1.73	1.07	0.76	2.65	12.43	12.53	19.63	24.96	9.45	6.37	5.43	[1]0.382

[1]Serial correlation for annual mean flows.

Table E50.3. Serial correlation for 1-year lag for monthly mean flow for station 06438000, Belle Fourche River near Elm Springs (October 1934 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.018	0.224	0.105	-0.009	-0.031	0.059	0.134	-0.131	0.168	-0.092	0.566	0.234

Table E50.4. Correlation matrix for monthly mean flow for station 06438000, Belle Fourche River near Elm Springs (October 1934 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.759	0.766	0.720	0.475	0.333	0.214	0.018	0.137	-0.006	0.215	0.140
Nov.	*	1.000	0.936	0.713	0.489	0.352	0.313	-0.058	0.198	-0.015	0.015	0.097
Dec.	*	*	1.000	0.801	0.485	0.413	0.274	-0.119	0.114	-0.053	0.044	0.066
Jan.	*	*	*	1.000	0.511	0.422	0.132	-0.114	0.096	-0.021	0.117	0.159
Feb.	*	*	*	*	1.000	0.451	0.252	-0.021	0.115	0.009	0.139	0.288
Mar.	*	*	*	*	*	1.000	0.332	0.037	0.003	0.065	0.158	0.248
Apr.	*	*	*	*	*	*	1.000	0.039	0.237	0.018	0.288	0.291
May	*	*	*	*	*	*	*	1.000	0.317	0.187	0.323	0.421
June	*	*	*	*	*	*	*	*	1.000	0.232	0.295	0.427
July	*	*	*	*	*	*	*	*	*	1.000	0.232	0.265
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.586
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E50.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06438000, Belle Fourche River near Elm Springs

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1934	7.00	27	7.00	26	7.00	24	8.14	22	17.4	32	29.4	39	41.1	48	49.5	47	73.8	41
1935	2.20	13	2.20	11	2.20	9	2.31	9	4.28	10	11.2	12	18.8	15	30.8	21	45.3	15
1936	.0000	1	.0000	1	.0000	1	.0000	1	.0000	1	.96	2	8.64	5	16.9	7	15.3	2
1937	10.0	33	10.0	33	11.3	35	16.6	37	20.6	39	27.3	36	33.4	32	39.0	29	63.3	34
1938	.0000	2	.0000	2	.86	6	2.07	8	3.50	8	10.7	10	16.4	11	21.1	10	38.2	12
1939	.0000	3	.0000	3	.0000	2	.50	4	1.37	4	3.55	5	12.6	8	24.4	14	32.8	8
1940	4.00	17	4.00	17	4.00	17	5.07	18	7.00	13	12.2	15	18.2	14	22.8	12	33.2	9
1941	10.0	34	10.0	34	10.0	31	11.0	31	13.4	24	16.5	22	17.7	13	28.1	18	51.5	20
1942	4.00	18	4.33	19	5.00	19	7.21	20	22.4	41	30.7	42	38.9	43	47.0	44	85.5	47
1943	4.00	19	4.67	21	5.86	21	9.00	24	12.8	23	14.6	20	19.4	17	28.6	19	50.9	18
1944	18.0	50	28.7	56	38.6	57	41.4	56	62.7	56	74.8	58	95.5	58	112	57	151	55
1945	16.0	47	16.0	46	16.9	45	17.8	40	19.8	36	21.9	27	32.9	31	51.2	49	70.3	39
1946	56.0	59	57.3	59	66.3	59	111	59	144	59	185	59	269	59	327	59	460	59
1947	30.0	57	30.0	57	30.0	56	36.4	55	39.0	55	52.0	55	69.9	55	75.9	54	120	52
1948	20.0	52	20.0	51	20.0	50	23.2	51	26.5	46	34.9	48	60.6	54	82.0	55	123	54
1949	2.00	9	2.33	12	3.29	13	4.57	16	7.50	14	10.9	11	18.9	16	32.3	23	60.9	30
1950	5.00	22	5.00	22	7.14	25	8.93	23	14.5	28	24.1	29	27.4	27	32.0	22	61.2	31
1951	4.00	20	4.33	20	6.86	23	9.14	25	16.8	31	27.8	37	47.7	51	55.8	53	108	51
1952	15.0	43	15.0	43	17.9	47	22.5	49	29.3	51	36.2	51	37.8	41	40.8	33	66.5	35
1953	2.00	10	2.00	9	2.57	10	4.36	14	15.4	29	25.5	31	47.8	52	48.8	46	70.4	40
1954	20.0	53	20.0	52	21.4	51	22.9	50	23.7	44	27.1	35	35.1	36	42.3	37	69.8	38
1955	15.0	44	16.7	47	18.6	48	18.9	45	19.7	35	22.2	28	22.3	22	25.1	15	67.1	36
1956	5.00	23	6.67	25	8.57	26	10.7	29	14.0	26	21.4	26	26.9	26	39.1	30	56.1	23
1957	15.0	45	15.0	44	15.7	41	20.4	47	28.3	50	30.2	41	37.2	38	41.5	36	57.6	24
1958	8.00	28	8.33	27	9.00	27	9.57	26	11.6	21	19.0	23	27.5	28	35.8	27	62.2	32
1959	5.00	24	5.00	23	5.57	20	7.79	21	11.4	20	19.4	24	19.5	19	22.5	11	24.0	4
1960	2.00	11	2.00	10	2.71	11	3.79	11	6.17	12	10.0	9	10.7	6	15.3	4	17.4	3
1961	.0000	4	.0000	4	.0000	3	.0000	2	.0000	2	1.00	3	5.33	2	9.43	1	6.93	1
1962	9.00	32	9.00	30	9.43	29	13.8	34	21.1	40	36.1	50	42.9	49	52.4	50	92.7	49
1963	2.00	12	3.00	14	3.29	14	4.29	12	13.8	25	25.5	32	28.9	29	33.8	25	55.2	22
1964	10.0	35	11.3	37	14.7	38	16.9	38	27.4	48	34.0	46	36.7	37	41.2	34	59.0	26
1965	10.0	36	11.7	38	15.0	39	18.6	42	23.2	43	31.3	43	37.3	39	43.2	39	68.9	37
1966	20.0	54	22.3	54	24.3	54	24.8	52	30.8	53	42.1	53	48.0	53	50.8	48	78.1	43
1967	12.0	40	14.0	42	16.1	43	18.1	41	24.2	45	36.0	49	40.9	46	46.8	43	59.1	27
1968	1.00	7	1.00	7	1.14	7	1.36	5	2.07	5	2.17	4	6.64	3	16.5	6	47.2	16
1969	5.00	25	5.00	24	5.86	22	6.71	19	7.78	15	13.7	17	20.1	20	27.9	17	51.1	19
1970	10.0	37	10.0	35	10.4	33	10.9	30	11.2	19	14.4	19	25.6	24	34.2	26	106	50
1971	8.00	29	9.00	31	11.6	36	14.0	35	15.8	30	25.8	33	34.9	35	54.8	52	208	57
1972	10.0	38	10.0	36	10.7	34	12.1	33	18.5	33	24.5	30	34.1	33	44.7	41	122	53
1973	3.00	15	3.17	16	3.79	16	4.32	13	14.2	27	28.1	38	37.7	40	53.3	51	83.0	46
1974	4.00	21	4.17	18	4.29	18	4.46	15	5.45	11	9.59	8	14.4	10	21.0	9	41.9	13
1975	10.0	39	12.3	39	16.1	44	20.7	48	32.9	54	37.1	52	40.3	45	44.1	40	82.2	45
1976	15.0	46	15.0	45	15.0	40	15.6	36	18.7	34	26.2	34	30.3	30	37.4	28	52.5	21
1977	25.0	56	25.0	55	25.0	55	25.0	53	27.9	49	33.6	45	40.9	47	44.8	42	90.3	48
1978	2.50	14	2.83	13	3.07	12	3.61	10	3.88	9	4.53	6	7.98	4	14.5	3	59.8	29
1979	8.50	31	8.83	29	9.57	30	9.85	28	10.7	18	14.9	21	21.3	21	27.3	16	58.8	25
1980	12.0	41	13.3	41	15.9	42	17.0	39	20.5	38	29.9	40	37.8	42	40.7	32	43.4	14
1981	.0000	5	.0000	5	.17	5	1.67	6	3.02	7	6.56	7	16.4	12	23.7	13	38.0	11
1982	40.0	58	42.7	58	48.6	58	59.2	58	64.9	58	72.9	57	87.5	57	116	58	254	58
1983	1.50	8	1.63	8	1.84	8	2.00	7	2.41	6	14.1	18	24.0	23	40.3	31	59.2	28
1984	18.0	51	18.0	49	18.6	49	19.3	46	23.0	42	31.9	44	34.2	34	41.4	35	76.1	42
1985	12.0	42	12.3	40	12.9	37	18.6	43	26.8	47	34.7	47	38.9	44	42.8	38	80.6	44
1986	16.0	48	18.0	50	22.6	52	46.1	57	64.8	57	69.8	56	79.8	56	87.8	56	162	56
1987	3.00	16	3.00	15	3.43	15	4.79	17	8.30	16	11.9	14	19.4	18	32.5	24	49.2	17
1988	8.00	30	8.50	28	9.00	28	9.71	27	10.2	17	11.5	13	12.5	7	16.9	8	27.9	6
1989	21.0	55	21.7	53	23.6	53	26.4	54	29.5	52	44.8	54	43.8	50	47.1	45	62.2	33
1990	.0000	6	.0000	6	.0000	4	.0000	3	.009	3	.20	1	3.35	1	11.6	2	29.0	7
1991	17.0	49	17.0	48	17.6	46	18.6	44	20.1	37	21.1	25	26.2	25	28.6	20	35.5	10
1992	6.80	26	9.00	32	10.3	32	11.0	32	11.9	22	12.7	16	13.2	9	16.2	5	25.2	5

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E50.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06438000, Belle Fourche River near Elm Springs

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1935	14,400	12	7,560	19	3,640	24	1,788	29	1,002	34	563	34	410	40	339	40	259	39
1936	1,890	47	1,570	46	1,050	47	765	45	516	44	375	43	276	46	225	49	164	52
1937	26,700	3	15,750	8	9,624	7	4,932	12	2,514	15	1,613	19	1,117	22	888	23	627	26
1938	5,410	30	2,847	35	1,445	42	817	44	477	46	376	42	280	45	235	48	180	49
1939	1,740	48	1,447	47	1,014	48	552	51	307	54	179	56	140	56	133	56	95.5	57
1940	4,290	36	2,260	41	1,209	44	661	48	491	45	327	46	246	51	218	50	169	51
1941	30,400	2	27,670	1	17,010	1	10,030	1	5,243	3	2,720	3	2,008	5	1,552	6	1,087	7
1942	12,300	17	10,470	13	7,620	11	5,004	11	3,692	8	2,310	8	1,733	8	1,400	10	966	11
1943	13,300	14	6,860	20	4,714	19	2,950	21	1,697	24	1,341	24	991	25	970	20	777	20
1944	17,900	9	16,330	6	11,920	4	7,922	3	4,587	4	2,615	5	2,968	2	2,422	1	1,683	1
1945	11,100	19	9,363	16	7,270	14	5,505	9	3,380	9	1,876	13	1,329	17	1,268	13	939	14
1946	21,600	6	13,670	9	8,597	9	7,052	5	6,267	2	4,099	1	3,016	1	2,324	2	1,679	2
1947	19,000	8	15,970	7	9,656	6	5,307	10	2,946	12	1,659	18	1,501	13	1,579	5	1,231	5
1948	4,040	38	3,503	32	2,741	30	2,014	27	1,240	29	864	30	649	31	744	28	598	28
1949	11,200	18	9,723	15	8,447	10	5,947	6	4,083	6	2,619	4	1,873	6	1,501	7	1,069	9
1950	6,490	27	5,020	26	3,999	23	3,739	18	2,199	19	1,601	20	1,152	21	933	22	715	22
1951	1,200	52	942	53	715	52	448	53	325	52	263	52	263	48	242	47	191	47
1952	12,500	16	11,000	11	7,481	13	4,249	17	2,247	17	1,292	25	956	27	805	27	604	27
1953	7,200	23	5,593	23	4,356	22	2,472	24	1,425	27	1,014	28	777	29	718	29	566	29
1954	3,950	39	2,163	43	1,552	40	855	43	760	38	507	38	474	34	401	36	335	37
1955	791	56	664	56	428	56	282	56	265	55	241	54	217	53	216	51	190	48
1956	2,050	46	1,280	48	1,114	45	881	41	584	41	331	45	253	50	262	46	235	43
1957	3,220	41	2,254	42	1,667	38	951	40	573	42	338	44	295	42	265	45	202	46
1958	4,330	35	2,597	38	1,533	41	1,371	35	784	36	558	36	451	36	384	38	289	38
1959	397	59	337	59	221	59	193	59	159	58	124	58	105	58	104	58	98.2	56
1960	3,100	43	2,567	39	1,869	36	1,067	37	566	43	301	49	239	52	192	53	148	54
1961	537	58	393	58	224	58	196	58	151	59	87.5	59	62.6	59	53.3	59	45.0	59
1962	24,600	5	18,670	3	12,970	3	9,796	2	6,511	1	3,902	2	2,745	3	2,104	3	1,418	3
1963	4,600	34	3,777	31	2,761	29	2,086	26	1,431	26	1,159	27	1,014	24	855	25	651	25
1964	20,200	7	17,100	4	9,134	8	4,551	14	3,061	11	1,667	16	1,209	20	958	21	672	23
1965	16,100	10	12,240	10	6,914	15	5,689	7	3,842	7	2,353	7	1,696	10	1,350	12	953	13
1966	3,410	40	3,027	34	2,137	34	1,413	34	1,123	31	838	31	648	32	545	32	444	33
1967	10,800	20	8,183	17	6,403	16	4,255	16	2,510	16	2,168	9	1,558	12	1,256	15	914	15
1968	848	55	700	55	495	55	383	55	324	53	299	50	290	43	275	42	216	45
1969	3,220	42	2,777	36	2,103	35	1,634	32	1,072	32	750	33	593	33	505	33	450	32
1970	5,310	31	3,997	30	2,790	28	2,000	28	1,668	25	1,398	22	1,068	23	882	24	665	24
1971	7,950	22	5,280	24	3,224	26	2,770	22	2,027	21	1,792	14	1,700	9	1,451	8	1,100	6
1972	6,970	24	5,160	25	3,529	25	2,664	23	1,990	22	1,668	15	1,288	18	1,380	11	1,085	8
1973	4,720	32	3,457	33	2,284	33	1,725	31	1,388	28	1,188	26	980	26	854	26	724	21
1974	1,240	50	1,128	50	964	49	859	42	701	39	525	37	431	37	398	37	378	35
1975	6,840	25	6,163	22	4,419	21	3,003	19	2,092	20	1,662	17	1,288	19	1,056	19	811	19
1976	26,400	4	16,900	5	11,170	5	5,664	8	3,179	10	1,996	12	1,495	14	1,200	16	828	18
1977	5,930	28	4,663	27	2,719	31	1,483	33	879	35	561	35	464	35	419	34	356	36
1978	14,200	13	10,870	12	7,620	12	4,546	15	2,812	14	2,054	11	2,030	4	1,649	4	1,238	4
1979	886	54	738	54	687	53	595	50	475	47	444	41	424	38	403	35	381	34
1980	4,260	37	2,089	44	1,061	46	687	47	436	48	298	51	256	49	215	52	163	53
1981	2,980	44	2,463	40	1,587	39	973	39	606	40	500	39	421	39	366	39	253	41
1982	35,200	1	22,770	2	14,570	2	7,905	4	4,425	5	2,545	6	1,821	7	1,449	9	1,058	10
1983	6,800	26	4,567	28	2,456	32	1,281	36	1,041	33	836	32	754	30	663	31	551	30
1984	8,380	21	6,587	21	5,711	17	4,839	13	2,814	13	2,137	10	1,562	11	1,268	14	912	16
1985	2,240	45	1,797	45	1,272	43	761	46	435	49	313	47	270	47	268	44	257	40
1986	13,300	15	9,800	14	5,048	18	2,989	20	2,239	18	1,392	23	1,414	15	1,125	18	834	17
1987	4,720	33	4,003	29	2,829	27	1,767	30	1,135	30	1,001	29	814	28	668	30	533	31
1988	1,230	51	983	52	676	54	451	52	360	50	309	48	285	44	270	43	245	42
1989	1,100	53	1,080	51	957	50	606	49	350	51	248	53	201	54	190	54	172	50
1990	650	57	531	57	411	57	236	57	174	57	148	57	143	55	137	55	114	55
1991	5,430	29	2,607	37	1,811	37	1,062	38	774	37	459	40	343	41	293	41	229	44
1992	1,620	49	1,252	49	800	51	434	54	255	56	179	55	139	57	125	57	92.3	58
1993	14,500	11	8,167	18	4,696	20	2,435	25	1,829	23	1,401	21	1,349	16	1,139	17	957	12

Table E51.1. Mean flow, in cubic feet per second, for station 06438500, Cheyenne River near Plainview

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1951	220	125	97.1	102	93.4	289	152	137	782	397	290	545	269
1952	219	135	46.6	12.5	596	2,715	2,571	1,457	894	589	491	317	837
1953	229	159	160	221	261	1,122	528	1,700	1,982	507	754	333	665
1954	190	169	113	60.2	268	277	562	380	839	159	284	254	295
1955	197	132	123	80.0	73.4	442	505	405	650	511	367	1,110	383
1956	228	123	202	166	153	924	315	436	310	468	359	171	323
1957	116	325	144	81.9	240	326	450	3,096	2,076	494	380	238	666
1958	234	188	170	180	212	334	517	225	1,378	945	584	251	435
1959	199	171	106	92.9	134	443	279	370	215	292	116	163	216
1960	126	93.8	157	56.0	119	874	201	170	206	61.8	147	43.0	189
1961	53.6	94.0	46.1	71.6	143	173	71.3	83.3	172	197	48.0	16.2	97.2
1962	39.2	114	28.6	10.0	188	667	139	6,279	6,278	2,585	494	256	1,430
1963	321	163	134	43.7	199	632	953	1,203	3,215	599	265	388	675
1964	206	142	80.0	104	148	177	358	553	4,766	860	434	256	669
1965	209	203	119	108	170	204	552	5,475	3,381	1,484	595	428	1,084
1966	378	211	206	88.7	101	2,225	1,438	530	296	350	565	401	570
1967	275	235	176	147	215	663	676	2,880	8,981	805	503	512	1,334
1968	263	215	150	133	231	388	375	233	1,492	479	535	382	405
1969	178	160	94.4	44.4	65.9	514	666	1,300	351	1,946	424	330	511
1970	269	191	122	84.7	201	240	2,478	1,702	1,424	366	339	360	647
1971	229	177	98.8	57.4	1,431	2,385	2,640	4,065	3,343	447	466	479	1,314
1972	745	317	154	89.0	378	2,040	720	1,705	2,549	1,065	719	413	910
1973	282	189	151	145	474	1,074	1,273	1,744	1,249	555	578	402	677
1974	325	202	154	437	741	473	962	501	329	367	402	334	433
1975	148	166	102	66.1	74.6	494	2,409	2,080	1,019	468	410	330	648
1976	207	127	139	54.0	152	376	398	378	3,522	982	638	387	610
1977	186	127	93.5	63.8	82.6	403	1,888	498	400	414	512	343	417
1978	381	166	110	88.5	88.7	4,359	735	5,106	1,512	901	681	423	1,227
1979	210	135	103	31.6	42.1	940	624	353	880	782	835	398	447
1980	228	189	134	33.6	119	415	304	171	708	172	284	134	241
1981	219	169	92.9	165	277	124	73.4	191	395	912	383	279	274

Table E51.2. Statistics on mean flow, in cubic feet per second, for station 06438500, Cheyenne River near Plainview (October 1950 through September 1981)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	31	31	31	31	31	31	31	31	31	31	31	31	31
Maximum	745	325	206	437	1,431	4,359	2,640	6,279	8,981	2,585	835	1,110	1,430
Percentile													
75th	269	191	154	133	261	940	962	1,744	2,549	901	578	402	677
50th	219	166	122	84.7	170	473	552	530	1,019	507	434	334	570
25th	190	132	97.1	56.0	101	326	315	353	395	367	339	254	323
Minimum	39.2	93.8	28.6	10.0	42.1	124	71.3	83.3	172	61.8	48.0	16.2	97.2
Mean	235.80	171.38	122.81	100.60	247.47	861.68	832.67	1464.72	1793.35	682.57	447.81	344.39	609.62
Standard deviation	121.41	53.16	41.96	79.96	268.95	942.64	771.99	1702.01	1990.55	529.42	183.44	188.02	357.46
Skewness	2.42	1.31	-0.19	2.66	3.27	2.29	1.42	1.61	2.11	2.08	-0.07	2.03	0.91
Coefficient of variation	0.51	0.31	0.34	0.79	1.09	1.09	0.93	1.16	1.11	0.78	0.41	0.55	0.59
Percent of annual flow	3.23	2.35	1.68	1.38	3.39	11.80	11.40	20.05	24.55	9.34	6.13	4.71	[1]0.044

[1]Serial correlation for annual mean flows.

Table E51.3. Serial correlation for 1-year lag for monthly mean flow for station 06438500, Cheyenne River near Plainview (October 1950 through September 1981)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
0.123	0.253	0.149	-0.007	0.147	0.021	0.134	-0.221	0.032	-0.186	0.243	0.046

Table E51.4. Correlation matrix for monthly mean flow for station 06438500, Cheyenne River near Plainview (October 1950 through September 1981)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.571	0.449	0.219	0.165	0.468	0.135	-0.022	0.026	-0.048	0.432	0.252
Nov.	*	1.000	0.437	0.218	0.191	0.097	0.079	0.217	0.202	0.004	0.278	0.100
Dec.	*	*	1.000	0.446	-0.052	0.037	-0.102	-0.241	-0.044	-0.333	0.211	0.089
Jan.	*	*	*	1.000	0.246	-0.136	-0.134	-0.165	-0.089	-0.174	0.098	0.017
Feb.	*	*	*	*	1.000	0.321	0.484	0.233	0.116	-0.113	0.071	0.071
Mar.	*	*	*	*	*	1.000	0.361	0.387	-0.016	0.014	0.411	0.132
Apr.	*	*	*	*	*	*	1.000	0.177	-0.060	-0.196	0.150	0.174
May	*	*	*	*	*	*	*	1.000	0.559	0.587	0.319	0.128
June	*	*	*	*	*	*	*	*	1.000	0.478	0.264	0.163
July	*	*	*	*	*	*	*	*	*	1.000	0.392	0.096
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.332
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E51.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06438500, Cheyenne River near Plainview

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1951	7.00	2	7.00	2	7.57	2	9.07	2	12.1	2	18.6	2	58.2	3	81.3	4	197	22
1952	100	30	100	30	100	29	121	30	151	29	156	28	165	27	188	28	219	23
1953	15.0	4	18.3	4	20.0	3	20.7	3	50.3	9	73.3	10	109	17	122	15	172	15
1954	55.0	23	58.3	23	63.6	23	67.9	20	71.3	16	76.9	12	92.7	10	101	7	143	8
1955	60.0	24	60.0	24	68.6	24	80.0	25	108	25	138	26	159	25	161	23	295	28
1956	30.0	11	30.0	11	35.0	12	40.7	11	49.7	8	96.3	19	141	23	160	22	169	13
1957	80.0	27	86.7	27	100	30	106	28	153	30	163	30	171	29	175	24	195	21
1958	50.0	20	50.0	20	55.7	19	72.9	22	90.7	24	96.5	20	107	15	125	17	158	10
1959	20.0	6	21.7	6	33.6	10	51.1	15	55.2	11	86.0	13	91.8	9	103	9	116	3
1960	10.0	3	16.7	3	22.1	5	23.4	5	42.3	6	47.6	4	63.2	5	58.8	2	68.8	2
1961	.0000	1	.0000	1	1.00	1	1.00	1	5.62	1	14.8	1	25.5	1	47.1	1	37.0	1
1962	15.0	5	20.0	5	20.7	4	22.1	4	30.7	5	73.7	11	103	14	125	16	186	19
1963	24.0	7	29.3	10	32.6	8	38.1	9	77.6	17	88.1	15	107	16	117	13	141	6
1964	60.0	25	66.7	25	70.0	25	75.7	24	83.5	20	110	22	123	20	140	19	169	14
1965	50.0	21	53.3	22	57.9	20	61.8	19	77.7	18	92.7	17	118	19	146	21	224	24
1966	80.0	28	86.7	28	95.7	28	110	29	126	27	161	29	178	30	192	29	241	26
1967	90.0	29	93.3	29	94.3	27	99.3	27	111	26	137	25	159	24	177	25	228	25
1968	25.0	8	28.3	9	32.9	9	35.7	8	44.3	7	51.5	5	61.7	4	82.5	5	127	4
1969	45.0	17	48.3	18	55.0	18	60.4	18	82.5	19	102	21	117	18	137	18	182	17
1970	50.0	22	50.0	21	51.0	17	52.1	17	56.9	13	60.9	6	90.3	8	118	14	191	20
1971	45.0	18	45.0	17	46.3	16	49.1	14	59.4	15	96.2	18	132	22	185	27	339	30
1972	75.0	26	78.3	26	83.6	26	98.6	26	134	28	144	27	160	26	184	26	268	27
1973	30.0	12	30.0	12	33.6	11	48.9	13	83.5	21	124	23	169	28	219	30	337	29
1974	35.0	14	38.3	15	44.7	15	51.1	16	59.1	14	68.5	8	80.4	7	101	8	132	5
1975	34.0	13	35.0	13	35.7	13	38.4	10	52.5	10	87.1	14	101	13	115	12	161	11
1976	35.0	15	35.7	14	37.4	14	41.6	12	55.9	12	69.4	9	79.5	6	90.6	6	153	9
1977	48.0	19	49.3	19	59.7	22	73.6	23	84.1	22	88.2	16	93.4	11	104	10	184	18
1978	25.0	9	25.3	8	26.3	6	27.9	7	29.7	3	36.1	3	58.1	2	73.1	3	141	7
1979	25.0	10	25.0	7	26.3	7	27.4	6	30.3	4	63.5	7	94.4	12	115	11	180	16
1980	35.0	16	38.3	16	59.3	21	69.1	21	89.1	23	128	24	132	21	142	20	161	12

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E51.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06438500, Cheyenne River near Plainview

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1951	2,730	29	1,738	29	1,546	28	1,018	29	784	28	593	27	539	27	505	27	404	26
1952	30,900	2	24,300	3	16,140	3	9,115	4	4,954	7	3,012	6	2,407	6	1,992	6	1,481	7
1953	11,700	12	9,717	12	6,094	12	3,544	16	2,079	16	1,872	15	1,421	16	1,361	14	1,109	12
1954	4,700	24	3,163	25	2,022	25	1,171	27	974	25	614	26	596	24	517	25	426	25
1955	13,400	11	7,433	13	3,770	18	1,969	20	1,110	22	742	23	665	23	669	23	593	21
1956	3,000	28	2,667	27	1,983	26	1,326	25	952	27	652	25	568	26	524	24	473	24
1957	27,000	5	14,610	8	9,440	9	6,375	9	4,494	8	2,698	8	1,973	8	1,571	10	1,146	11
1958	5,650	20	3,773	21	2,526	23	2,206	19	1,383	20	1,188	19	979	18	839	18	669	20
1959	3,510	27	1,997	28	1,010	30	743	30	470	30	430	30	376	30	346	30	292	29
1960	4,870	23	4,133	19	2,843	20	1,757	22	968	26	564	28	436	28	372	29	279	30
1961	1,340	31	753	31	551	31	324	31	255	31	207	31	162	31	139	31	144	31
1962	30,800	3	25,700	1	16,780	2	13,660	2	10,420	1	7,279	1	5,257	1	4,012	1	2,776	1
1963	13,600	10	9,773	11	6,217	11	4,910	10	3,234	11	2,263	12	1,795	11	1,572	9	1,149	10
1964	25,100	6	19,070	4	11,430	6	7,600	7	5,174	6	2,847	7	2,081	7	1,659	8	1,196	8
1965	29,000	4	17,970	5	11,080	7	9,310	3	6,543	3	4751	3	3,562	5	2,800	5	1,995	5
1966	6,240	17	6,040	17	5,123	15	3,563	15	2,749	13	1,953	14	1,436	15	1,152	16	915	16
1967	32,700	1	24,670	2	20,330	1	14,410	1	8,981	2	6,031	2	4,267	2	3,384	2	2,407	2
1968	4,930	22	3,480	23	2,709	21	1,867	21	1,560	19	1,005	20	846	21	726	21	583	23
1969	6,110	18	5,650	18	5,303	13	3,623	14	2,085	15	1,232	17	1,222	17	1,077	17	898	17
1970	11,000	13	10,230	10	7,566	10	4,590	11	3,266	10	2,414	9	1,894	9	1,514	12	1,109	13
1971	16,700	9	12,400	9	9,651	8	8,185	5	5,595	4	4,431	4	3,730	4	3,269	3	2,397	3
1972	8,170	16	6,350	16	4,147	17	3,665	13	2,672	14	2,145	13	1,791	12	1,752	7	1,487	6
1973	4,590	25	4,053	20	2,871	19	2,289	18	1,970	17	1,798	16	1,514	14	1,353	15	1,089	14
1974	1,990	30	1,627	30	1,519	29	1,313	26	1,025	24	751	22	763	22	721	22	586	22
1975	9,410	14	6,860	15	4,837	16	4,100	12	3,034	12	2,317	11	1,891	10	1,565	11	1,154	9
1976	20,700	7	16,930	6	11,500	5	6,541	8	3,844	9	2,339	10	1,764	13	1,429	13	1,055	15
1977	8,900	15	7,103	14	5,143	14	3,152	17	1,900	18	1,196	18	947	19	805	19	689	19
1978	19,300	8	16,600	7	12,020	4	8,073	6	5,577	5	3,434	5	3,778	3	3,046	4	2,257	4
1979	5,940	19	2,987	26	2,229	24	1,650	23	1,199	21	997	21	850	20	790	20	752	18
1980	5,130	21	3,383	24	1,909	27	1,086	28	730	29	447	29	414	29	403	28	342	28
1981	4,560	26	3,567	22	2,548	22	1,598	24	1,056	23	714	24	587	25	507	26	374	27

Table E52.1. Mean flow, in cubic feet per second, for station 06439300, Cheyenne River at Cherry Creek

Water year	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1960	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	136	51.0	(2)
1961	53.0	91.2	40.2	55.8	156	187	78.3	90.8	180	209	55.8	13.0	100
1962	32.5	98.6	16.3	.16	175	660	159	6,905	7,043	2,841	606	269	1,575
1963	412	171	123	45.0	188	631	976	1,245	3,661	784	300	350	739
1964	220	157	83.4	109	156	205	401	736	4,783	854	403	271	694
1965	223	215	100	79.2	159	206	561	6,470	3,756	1,657	592	450	1,214
1966	393	219	211	80.2	89.3	3,909	1,791	652	312	379	562	368	753
1967	278	248	160	135	229	804	669	3,072	10,210	1,207	534	496	1,498
1968	283	224	150	137	261	442	430	316	1,865	547	515	384	461
1969	169	158	97.4	45.3	68.2	699	994	1,589	345	2,244	461	297	603
1970	281	193	126	86.8	246	246	2,823	1,836	1,527	361	346	363	701
1971	211	181	102	57.2	1,617	3,735	2,667	4,155	4,055	434	371	723	1,521
1972	560	326	164	90.8	436	2,271	679	2,495	3,496	902	691	421	1,046
1973	278	222	127	177	454	1,403	1,543	1,848	1,257	576	609	399	742
1974	341	229	162	435	726	561	963	488	345	372	386	323	442
1975	152	177	106	68.7	71.6	512	2,708	2,951	1,125	740	393	327	780
1976	191	134	141	55.6	157	366	386	390	3,848	999	678	403	642
1977	187	130	100	65.1	84.8	395	2,579	514	462	448	573	423	496
1978	638	163	117	98.7	97.9	7,645	1,705	6,065	2,025	967	775	433	1,748
1979	216	145	120	33.8	40.7	1,004	841	366	901	924	834	364	485
1980	208	233	138	38.3	124	445	398	175	681	178	297	138	254
1981	227	144	97.8	191	310	163	77.0	197	400	1,036	516	289	305
1982	164	146	89.8	36.9	112	860	891	9,947	2,172	1,080	716	591	1,416
1983	2,362	312	242	248	476	904	1,126	1,922	765	465	472	349	808
1984	222	191	78.3	78.1	386	365	709	3,447	5,569	674	542	394	1,051
1985	218	223	152	153	126	1,398	286	229	266	264	295	285	327
1986	168	143	87.6	259	999	5,240	4,296	3,721	2,022	563	381	930	1,569
1987	1,039	522	388	279	454	4,518	4,212	2,763	986	455	449	302	1,370
1988	197	194	152	47.3	61.0	655	348	508	281	510	287	227	290
1989	153	120	66.7	70.1	78.5	971	259	646	131	167	154	326	264
1990	113	184	90.3	146	209	387	112	485	331	234	157	162	218
1991	77.5	147	56.2	6.86	34.3	243	316	2,172	4,224	353	320	226	681
1992	128	228	194	105	212	303	150	156	417	580	180	158	234
1993	90.2	132	93.5	71.8	141	3,431	915	3,616	2,350	4,622	1,125	530	1,442

[1]Indicates a no-value month.
[2]Incomplete water year.

Table E52.2. Statistics on mean flow, in cubic feet per second, for station 06439300, Cheyenne River at Cherry Creek (October 1960 through September 1993)

Statistic	Month												Annual
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Number	33	33	33	33	33	33	33	33	33	33	33	33	33
Maximum	2,362	522	388	435	1,617	7,645	4,296	9,947	10,210	4,622	1,125	930	1,748
Percentile													
75th	282	223	152	141	348	1,400	1,624	3,259	3,708	983	599	422	1,292
50th	216	181	117	79.2	159	655	709	1,589	1,257	576	461	350	701
25th	158	144	90.1	51.4	93.6	365	332	437	372	375	310	278	384
Minimum	32.5	91.2	16.3	0.16	34.3	163	77.0	90.8	131	167	55.8	13.0	100
Mean	317.73	193.96	126.44	108.66	276.83	1,386.79	1,122.68	2,186.90	2,175.48	867.45	471.99	363.15	802.09
Standard deviation	413.46	79.60	66.43	90.42	317.71	1,774.29	1,138.27	2,356.56	2,314.98	886.49	219.53	168.34	484.63
Skewness	4.17	2.36	1.99	1.88	2.90	2.09	1.54	1.62	1.71	2.93	0.65	1.18	0.49
Coefficient of variation	1.30	0.41	0.53	0.83	1.15	1.28	1.01	1.08	1.06	1.02	0.47	0.46	0.60
Percent of annual flow	3.31	2.02	1.32	1.13	2.88	14.45	11.70	22.78	22.67	9.04	4.92	3.78	[1]-0.151

[1]Serial correlation for annual mean flows.

Table E52.3. Serial correlation for 1-year lag for monthly mean flow for station 06439300, Cheyenne River at Cherry Creek (October 1960 through September 1993)

Month											
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
-0.088	-0.016	-0.064	0.101	0.148	0.085	0.261	-0.307	-0.104	-0.146	0.101	0.020

Table E52.4. Correlation matrix for monthly mean flow for station 06439300, Cheyenne River at Cherry Creek (October 1960 through September 1993)

Month	Month											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Oct.	1.000	0.597	0.626	0.428	0.162	0.210	0.215	0.008	-0.120	-0.163	0.075	0.024
Nov.	*	1.000	0.903	0.498	0.202	0.230	0.343	-0.056	-0.057	-0.241	-0.023	-0.046
Dec.	*	*	1.000	0.504	0.118	0.283	0.374	-0.201	-0.224	-0.249	0.020	-0.042
Jan.	*	*	*	1.000	0.439	0.199	0.314	-0.178	-0.234	-0.239	-0.104	0.151
Feb.	*	*	*	*	1.000	0.355	0.471	0.133	0.113	-0.169	-0.093	0.583
Mar.	*	*	*	*	*	1.000	0.577	0.330	-0.048	0.108	0.338	0.518
Apr.	*	*	*	*	*	*	1.000	0.201	-0.118	-0.139	0.082	0.566
May	*	*	*	*	*	*	*	1.000	0.436	0.414	0.444	0.508
June	*	*	*	*	*	*	*	*	1.000	0.315	0.260	0.290
July	*	*	*	*	*	*	*	*	*	1.000	0.670	0.200
Aug.	*	*	*	*	*	*	*	*	*	*	1.000	0.451
Sept.	*	*	*	*	*	*	*	*	*	*	*	1.000

Table E52.5. Lowest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06439300, Cheyenne River at Cherry Creek

Water year[1]	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		14		30		60		90		120		183	
1961	.0000	1	.0000	1	.0000	1	.0000	1	.067	1	4.73	1	24.1	1	35.9	1	29.3	1
1962	15.0	3	15.0	3	20.0	3	21.4	3	28.5	3	64.0	9	98.9	12	128	17	202	22
1963	27.0	8	31.7	8	32.4	8	40.9	10	81.9	20	93.0	18	112	17	125	16	154	9
1964	35.0	11	38.3	13	39.3	13	41.8	11	57.3	13	86.4	16	104	16	124	14	164	13
1965	50.0	21	53.3	22	57.1	21	59.3	20	71.2	18	82.2	15	112	19	140	20	226	24
1966	80.0	28	86.7	29	98.6	30	109	30	125	29	145	30	169	28	187	27	235	25
1967	80.0	29	80.0	28	85.7	28	91.4	28	108	27	140	28	168	27	186	26	249	27
1968	30.0	9	32.0	10	35.4	10	37.9	8	45.1	8	52.6	6	63.3	4	83.6	5	128	5
1969	50.0	22	55.0	24	60.7	25	66.1	22	79.0	19	104	21	126	22	147	23	189	19
1970	45.0	17	45.0	17	46.1	16	47.1	14	53.4	11	61.4	7	92.9	10	117	13	189	18
1971	45.0	18	45.0	18	48.9	17	49.5	16	63.3	17	100	20	139	24	189	28	344	29
1972	50.0	23	53.3	23	57.1	22	65.4	21	126	30	143	29	170	29	192	29	274	28
1973	30.0	10	31.7	9	35.0	9	49.3	15	87.8	24	131	26	177	30	230	30	351	30
1974	35.0	12	38.3	14	44.3	15	49.6	17	58.9	15	69.6	11	82.2	7	105	9	135	7
1975	35.0	13	35.3	11	35.6	11	38.2	9	52.7	10	89.6	17	103	15	115	12	160	12
1976	35.0	14	35.7	12	38.9	12	44.6	12	58.0	14	72.8	13	83.2	8	93.8	7	157	10
1977	50.0	24	55.0	25	61.4	26	77.1	26	84.2	21	97.6	19	102	14	113	11	243	26
1978	25.0	5	25.7	5	27.4	6	29.6	5	31.0	4	37.1	3	61.3	3	78.9	4	144	8
1979	25.0	6	25.7	6	27.3	5	29.9	6	32.1	5	67.1	10	98.9	13	125	15	179	17
1980	40.0	16	42.7	16	60.4	24	71.9	24	90.7	25	117	24	137	23	144	22	169	15
1981	25.0	7	25.7	7	28.7	7	31.4	7	34.8	6	44.4	4	71.3	6	90.9	6	133	6
1982	142	31	142	31	155	31	175	31	228	31	239	31	244	31	293	31	704	32
1983	45.0	19	46.7	19	50.0	19	53.3	19	56.4	12	72.1	12	112	18	136	19	214	23
1984	55.0	26	56.7	26	59.6	23	75.5	25	117	28	134	27	143	25	163	24	201	21
1985	70.0	27	73.3	27	77.9	27	78.9	27	85.8	23	105	22	126	20	143	21	190	20
1986	180	32	185	32	191	32	200	32	270	32	326	32	365	32	394	32	589	31
1987	20.0	4	21.7	4	25.0	4	27.8	4	36.1	7	49.8	5	85.5	9	112	10	159	11
1988	35.0	15	38.3	15	43.7	14	45.1	13	50.8	9	63.0	8	70.1	5	78.8	3	111	3
1989	50.0	25	51.7	21	56.4	20	67.5	23	85.7	22	109	23	126	21	132	18	167	14
1990	5.00	2	5.47	2	5.70	2	5.83	2	6.77	2	14.6	2	30.7	2	56.9	2	78.8	2
1991	84.0	30	86.7	30	88.9	29	93.4	29	98.8	26	124	25	154	26	163	25	173	16
1992	47.0	20	48.7	20	49.7	18	52.4	18	62.5	16	80.2	14	97.2	11	95.1	8	114	4

[1]Low-flow water year is Apr. 1 to Mar. 31.

Table E52.6. Highest mean flow, in cubic feet per second, and ranking for the following number of consecutive days, for station 06439300, Cheyenne River at Cherry Creek

Water year	Flow, in cubic feet per second, and ranking for number of consecutive days																	
	1		3		7		15		30		60		90		120		183	
1961	2,130	32	935	33	566	33	331	33	244	33	219	33	171	33	148	33	155	33
1962	32,500	3	26,500	3	18,700	4	15,750	3	11,910	1	8,137	1	5,849	1	4,461	2	3,071	2
1963	12,000	18	10,160	17	6,727	18	5,420	15	3,661	18	2,479	18	1,969	17	1,727	14	1,267	15
1964	24,800	6	20,770	6	12,120	8	7,847	10	5,190	11	2,849	15	2,162	15	1,705	16	1,232	16
1965	32,300	4	20,800	5	13,650	5	11,050	5	7,736	5	5,490	5	4,083	7	3,192	7	2,258	8
1966	13,800	16	12,670	15	10,170	13	6,756	14	4,782	12	3,039	13	2,181	14	1,714	15	1,284	13
1967	37,500	2	33,570	2	26,200	2	16,450	2	10,290	3	6,822	2	4,873	3	3,851	4	2,732	5
1968	6,250	23	4,980	23	3,439	24	2,399	24	1,988	23	1,230	23	987	23	835	24	682	24
1969	8,940	20	7,203	21	6,533	19	4,292	20	2,424	20	1,492	22	1,423	20	1,307	20	1,084	20
1970	15,300	14	13,900	12	9,630	15	5,385	16	3,850	15	2,756	16	2,090	16	1,662	17	1,209	18
1971	13,400	17	12,010	16	9,814	14	9,303	7	6,264	8	4,716	7	4,389	6	3,840	5	2,782	4
1972	14,400	15	9,290	19	5,873	20	5,209	17	3,667	17	3,052	12	2,327	12	2,223	11	1,787	11
1973	8,250	22	6,613	22	4,010	23	2,771	22	2,290	22	1,988	19	1,746	19	1,530	18	1,213	17
1974	2,390	31	1,833	31	1,689	28	1,383	28	1,035	28	793	28	781	25	740	25	602	25
1975	8,330	21	7,470	20	5,843	21	5,037	18	3,849	16	2,921	14	2,336	11	1,952	12	1,415	12
1976	24,000	8	17,330	9	12,230	7	7,223	12	4,178	14	2,532	17	1,898	18	1,530	19	1,118	19
1977	10,200	19	10,100	18	7,777	17	4,541	19	2,608	19	1,555	20	1,190	22	1,004	22	833	22
1978	28,400	5	26,330	4	20,640	3	13,900	4	8,653	4	5,571	4	5,684	2	4,515	1	3,249	1
1979	3,620	26	2,630	27	2,299	26	1,876	26	1,426	25	1,080	24	906	24	888	23	829	23
1980	2,950	28	2,710	26	1,680	29	964	31	690	30	432	31	436	30	428	30	362	30
1981	5,800	24	4,167	25	2,942	25	1,880	25	1,273	26	831	27	673	26	576	26	422	28
1982	48,400	1	37,070	1	26,910	1	19,300	1	11,150	2	6,508	3	4,578	5	3,681	6	2,654	7
1983	19,200	10	13,210	14	7,929	16	4,157	21	2,424	21	1,540	21	1,332	21	1,199	21	956	21
1984	17,400	13	16,370	10	12,990	6	9,771	6	5,644	9	4,566	8	3,359	10	2,644	10	1,886	10
1985	5,200	25	4,477	24	4,070	22	2,593	23	1,486	24	862	26	666	27	557	27	470	26
1986	21,400	9	18,170	8	11,770	10	9,030	8	6,304	7	4,903	6	4,748	4	4,069	3	2,833	3
1987	18,000	12	13,700	13	10,450	12	7,459	11	6,608	6	4,445	9	3,956	8	3,176	8	2,242	9
1988	3,170	27	2,133	29	1,610	30	1,127	29	731	29	590	29	511	29	515	29	434	27
1989	2,800	29	2,467	28	2,029	27	1,744	27	1,105	27	880	25	642	28	517	28	396	29
1990	2,610	30	1,895	30	1,525	31	1,041	30	640	31	414	32	354	32	339	32	293	32
1991	18,500	11	14,830	11	10,700	11	8,205	9	5,254	10	3,276	11	2,307	13	1,810	13	1,268	14
1992	1,830	33	1,363	32	1,037	32	825	32	602	32	506	30	409	31	352	31	307	31
1993	24,500	7	18,400	7	12,060	9	6,814	13	4,716	13	3,751	10	3,619	9	3,016	9	2,706	6

Section F - Graphs showing variations in daily, monthly, and annual flow for stations with 10 or more years of daily record

Page 271 Follows

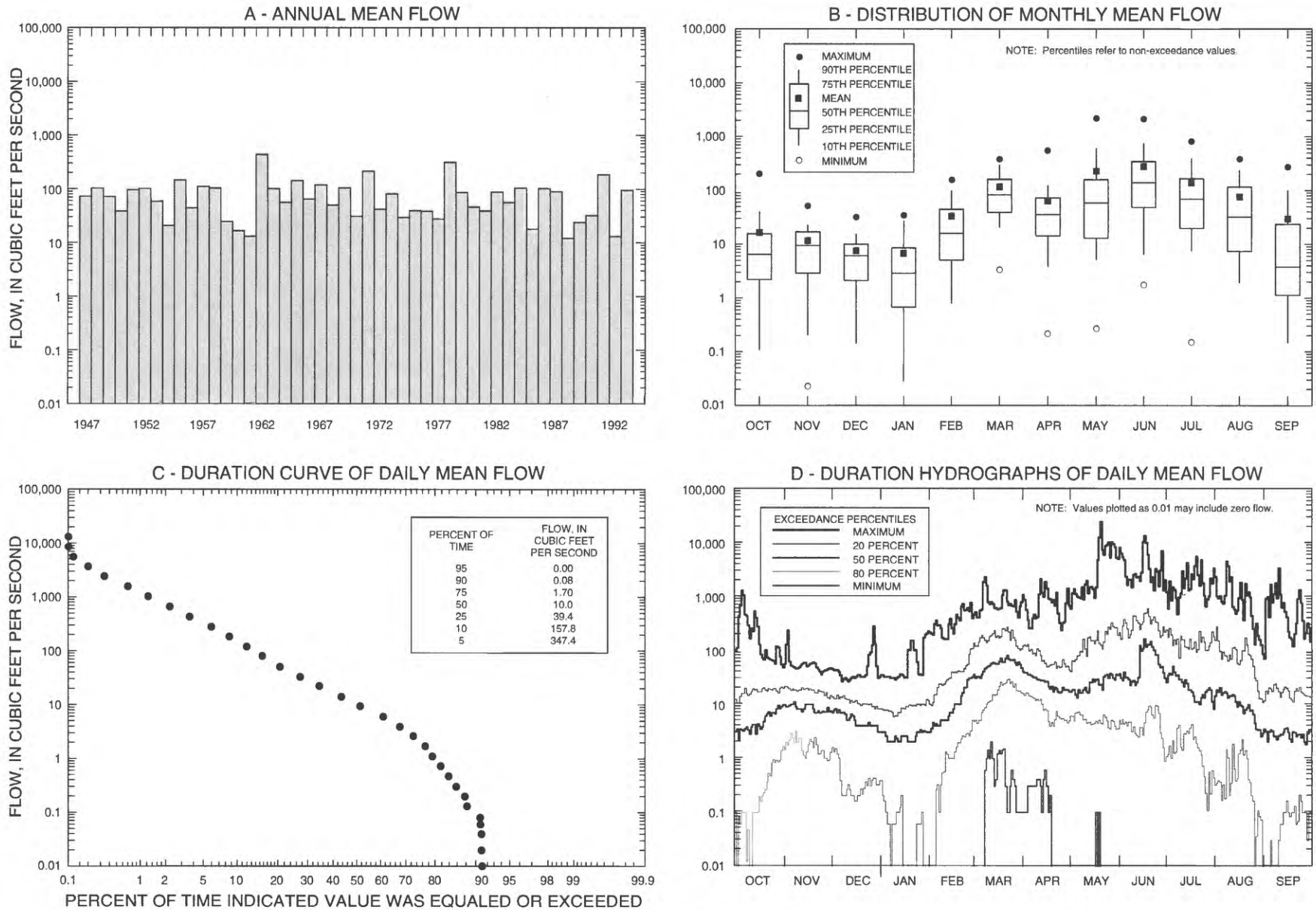


Figure F1. Variations in annual, monthly, and daily mean flow for station 06395000, Cheyenne River at Edgemont, water years 1947-93.

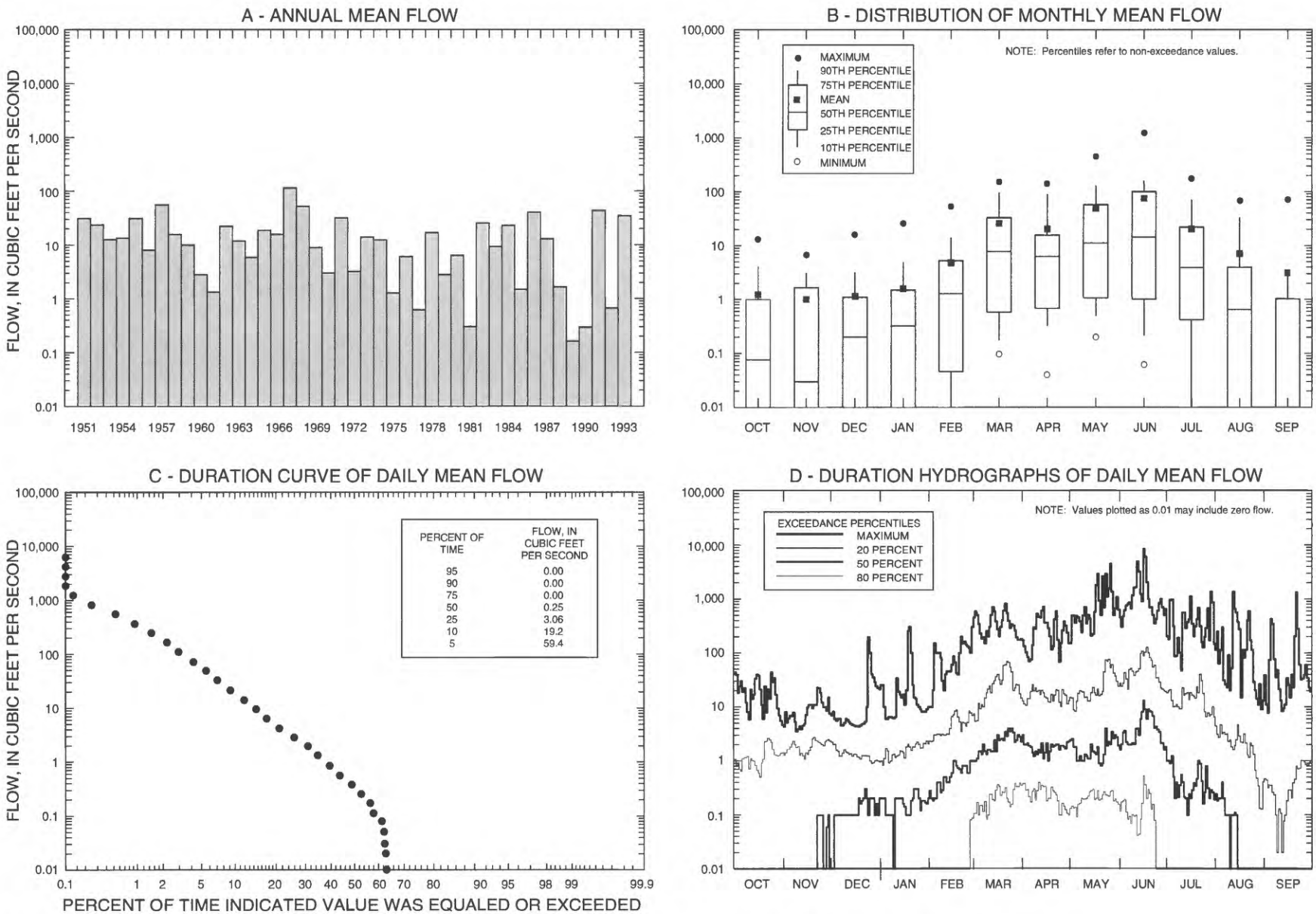


Figure F2. Variations in annual, monthly, and daily mean flow for station 06400000, Hat Creek near Edgemont, water years 1951-93.

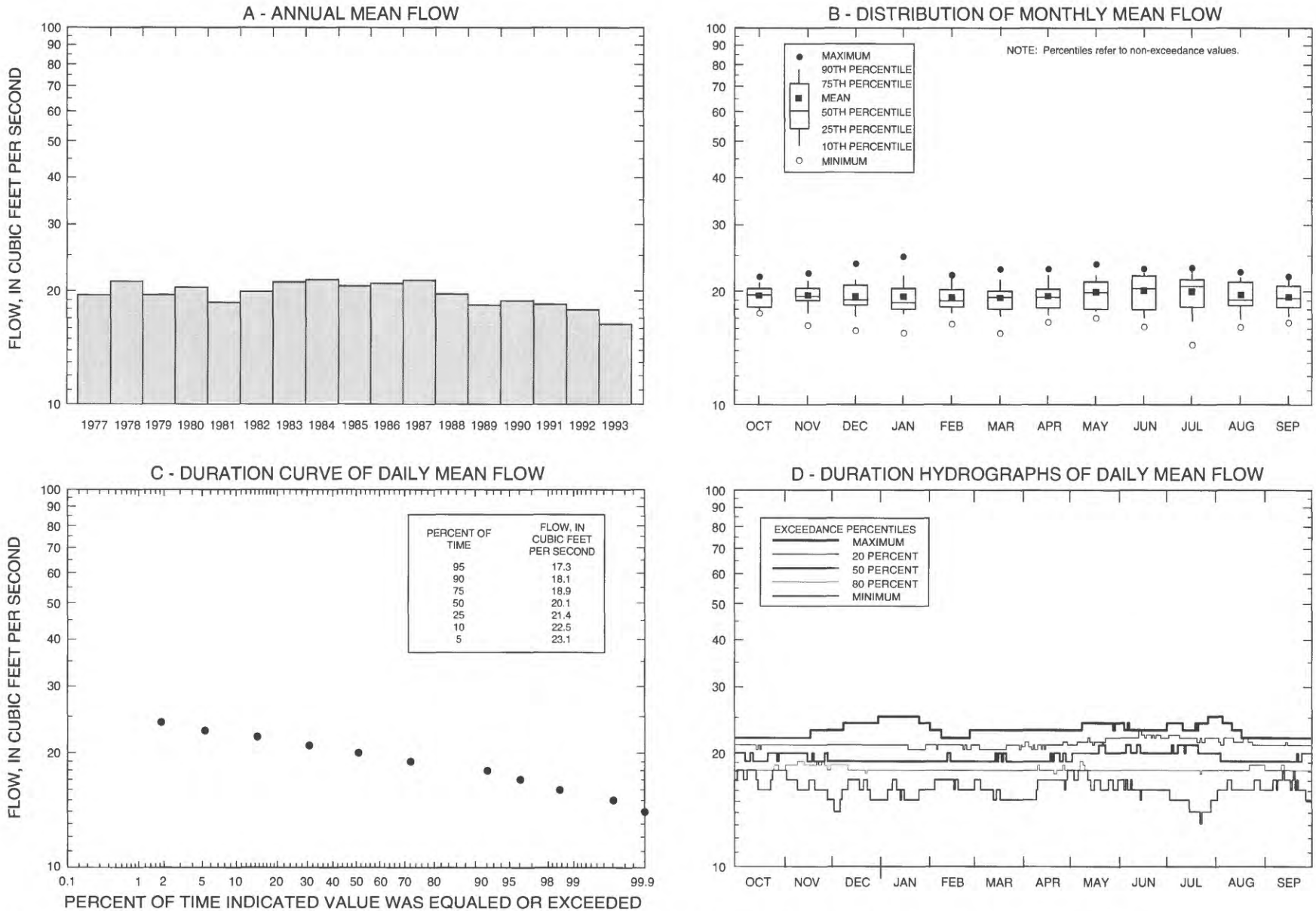


Figure F3. Variations in annual, monthly, and daily mean flow for station 06400497, Cascade Springs near Hot Springs, water years 1977-93.

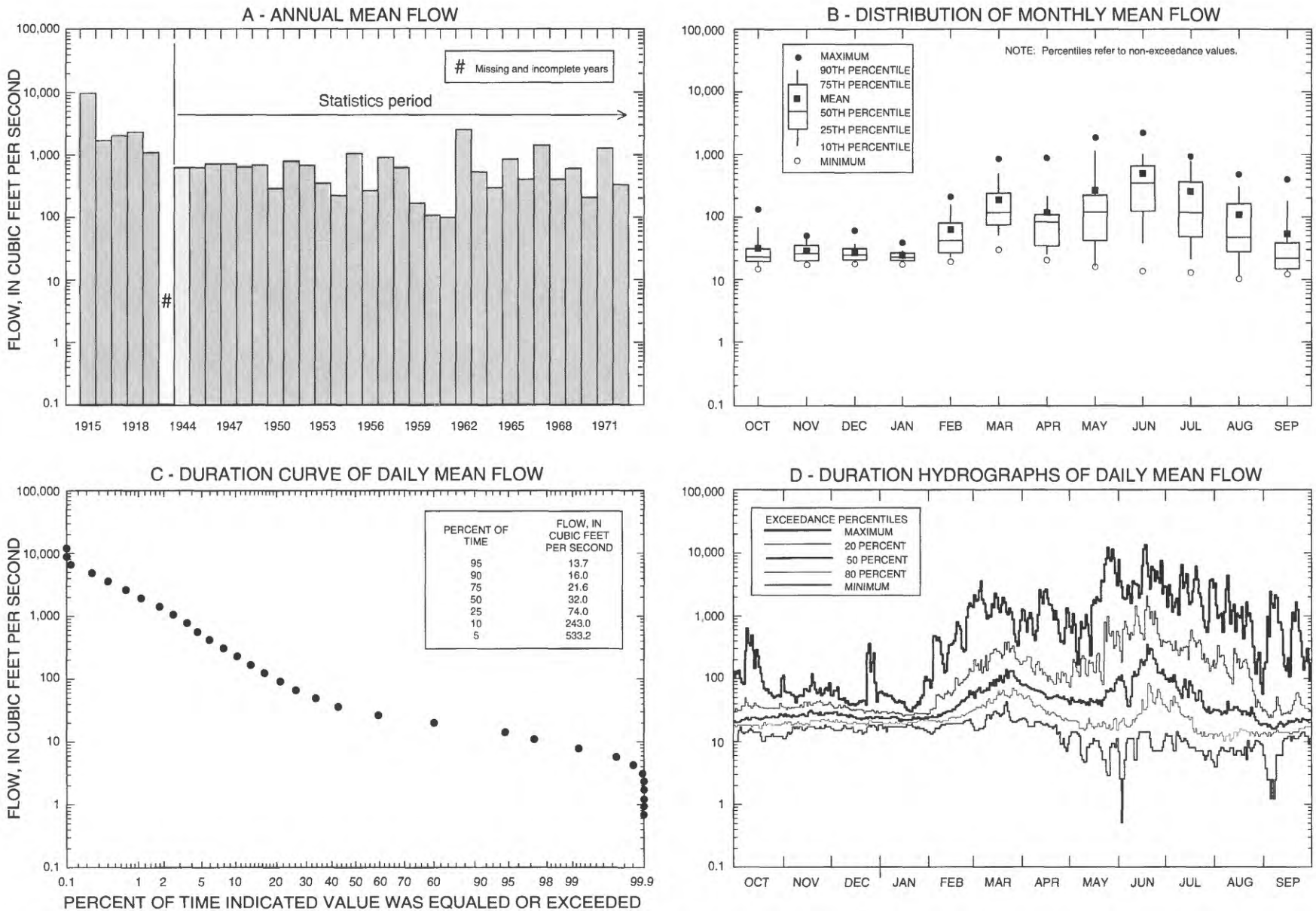


Figure F4. Variations in annual, monthly, and daily mean flow for station 06400500, Cheyenne River near Hot Springs, water years 1944-72 (annual hydrograph for water years 1915-19, 1944-72).

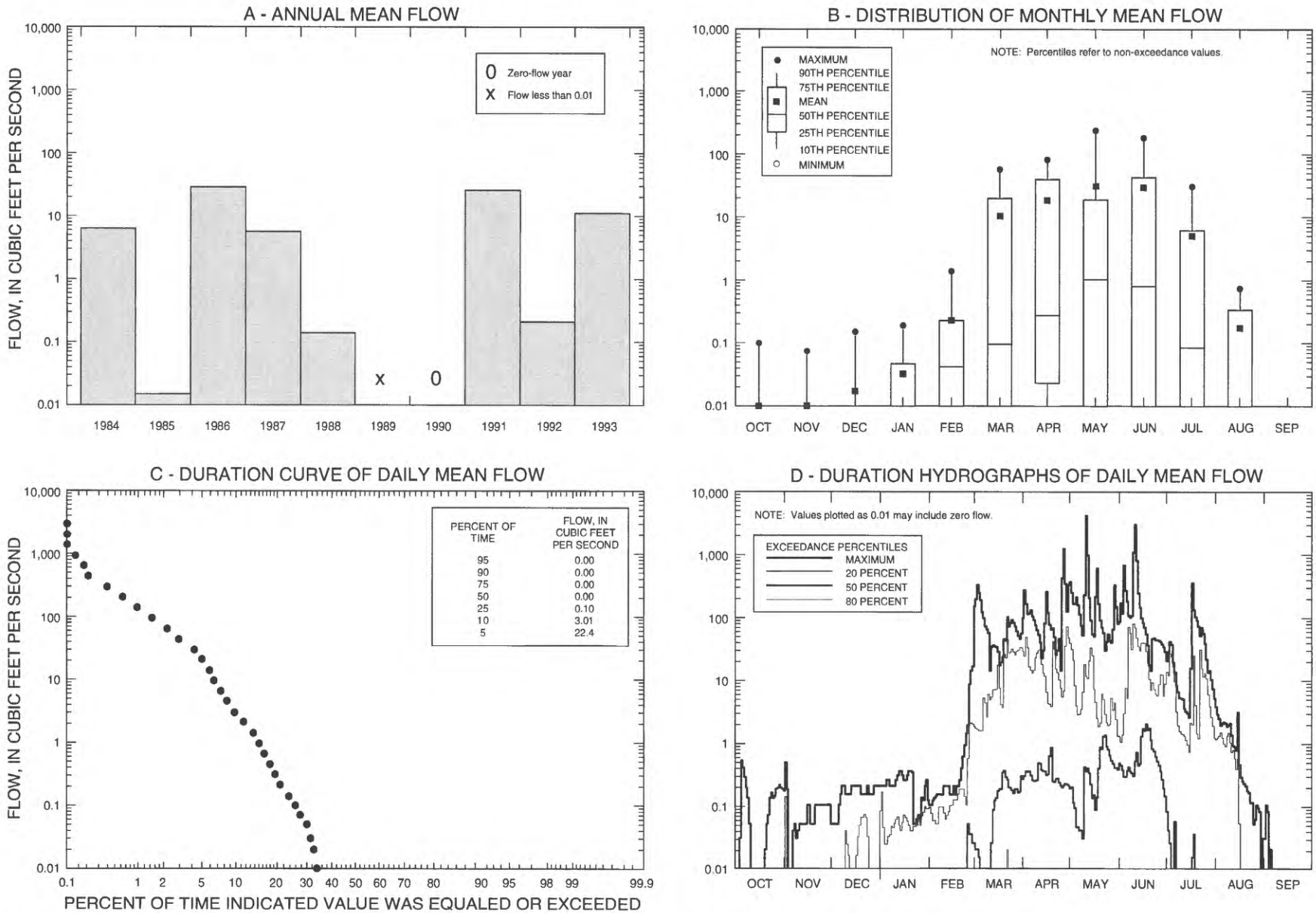


Figure F5. Variations in annual, monthly, and daily mean flow for station 06400875, Horsehead Creek at Oelrichs, water years 1984-93.

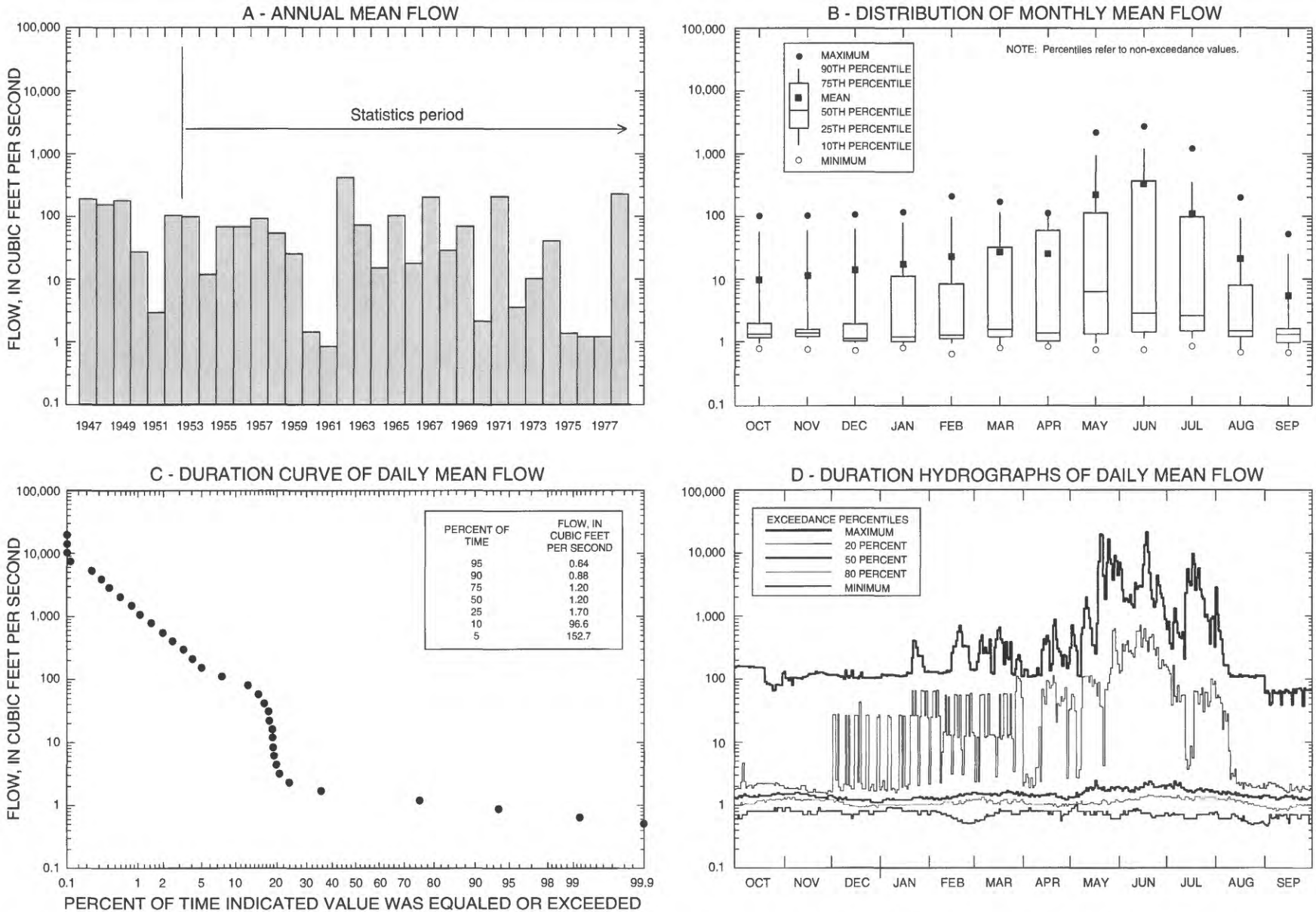


Figure F6. Variations in annual, monthly, and daily mean flow for station 06401500, Cheyenne River below Angostura Dam, water years 1953-78 (annual hydrograph for water years 1947-78).

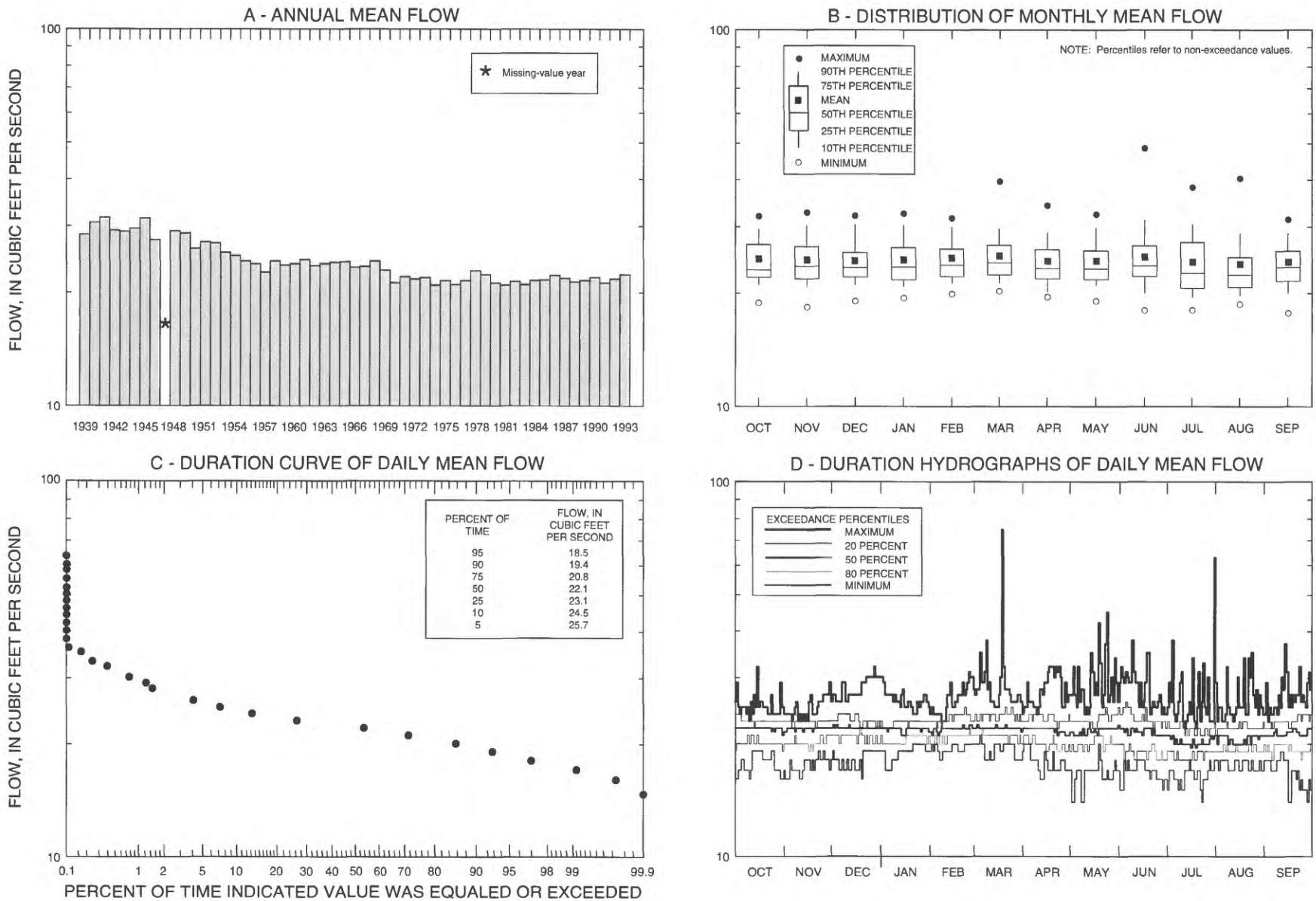


Figure F7. Variations in annual, monthly, and daily mean flow for station 06402000, Fall River at Hot Springs, water years 1939-93 (daily duration curve and hydrographs include only water years 1970-93).

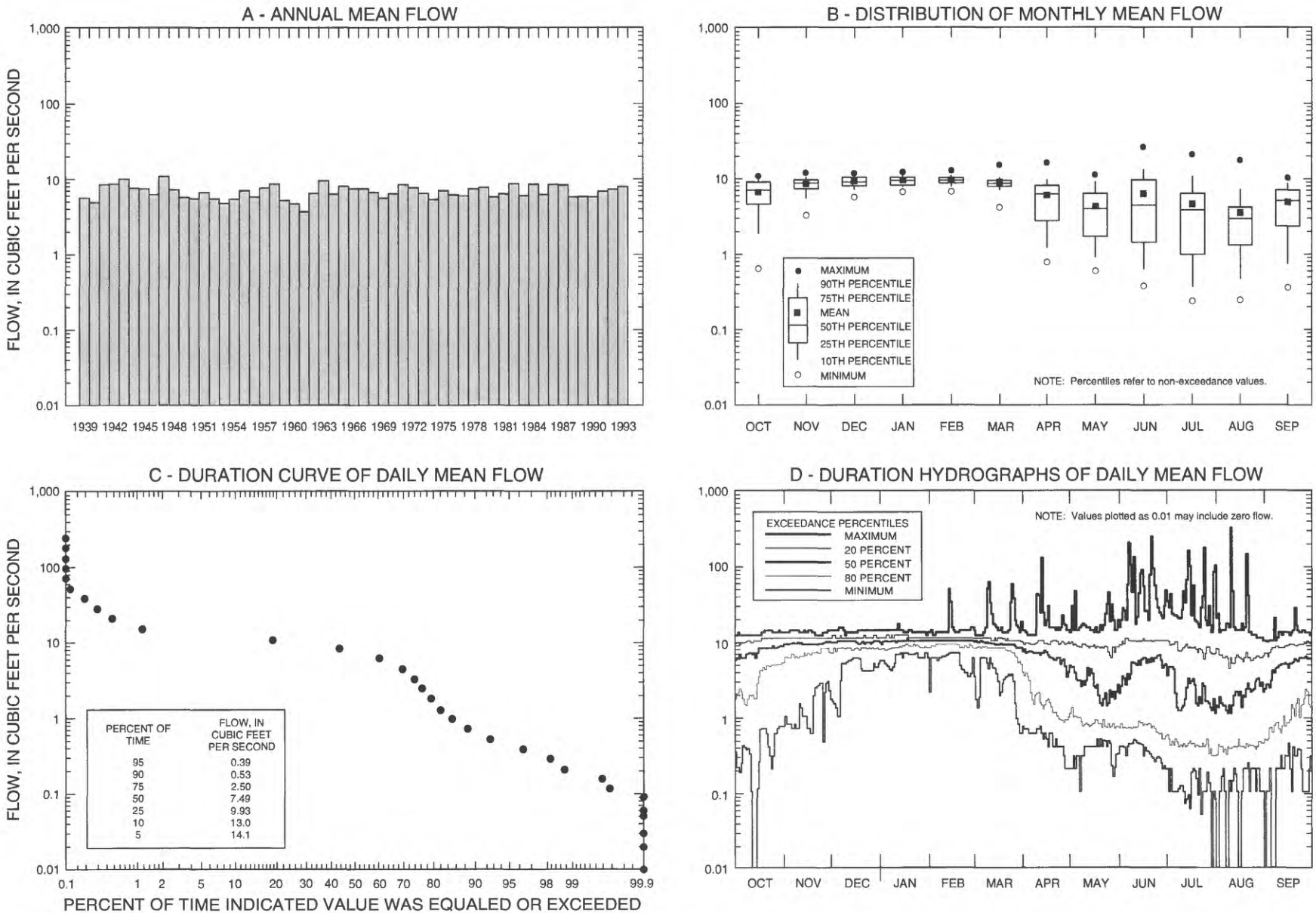


Figure F8. Variations in annual, monthly, and daily mean flow for station 06402500, Beaver Creek near Buffalo Gap, water years 1939-93.

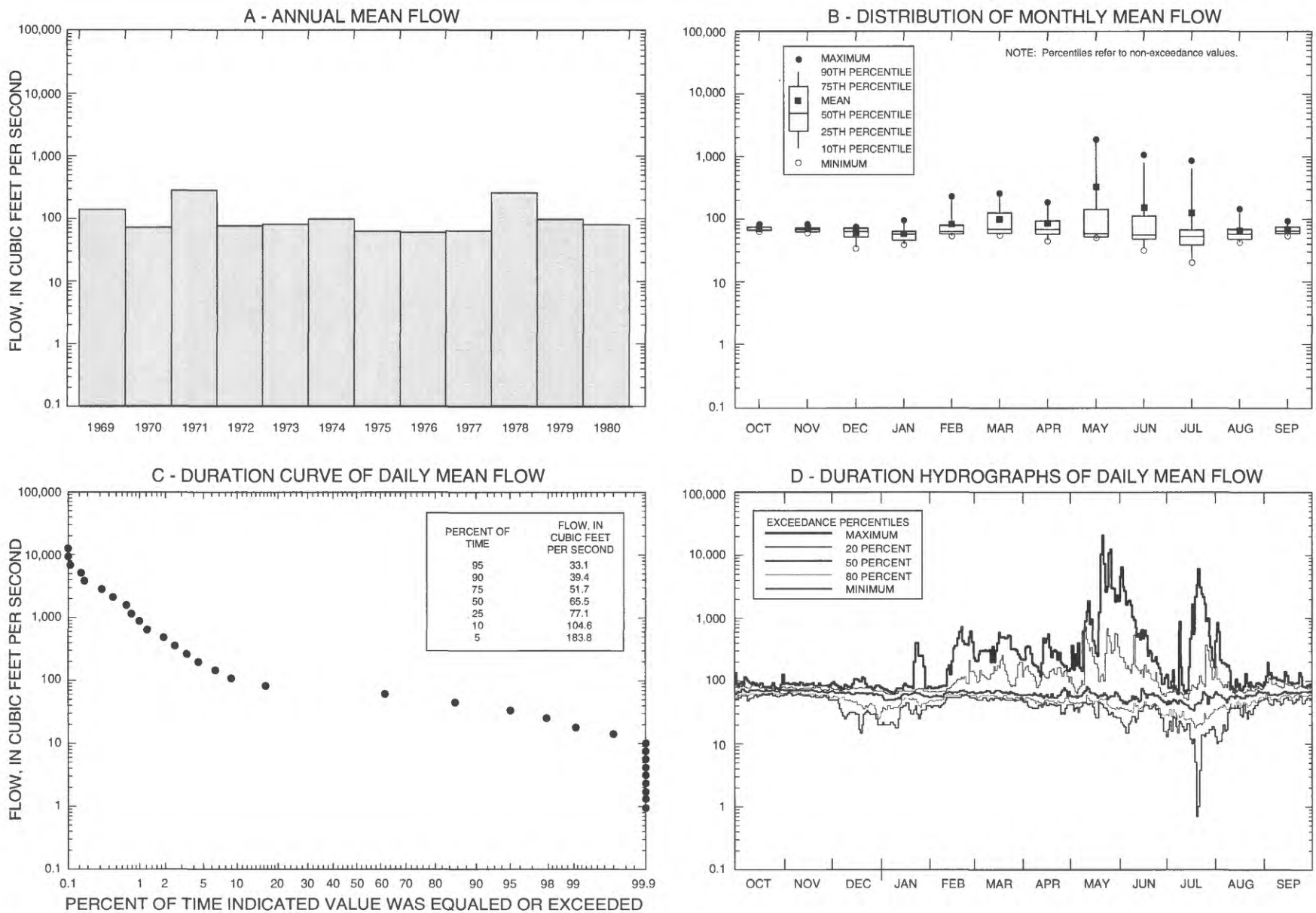


Figure F9. Variations in annual, monthly, and daily mean flow for station 06402600, Cheyenne River near Buffalo Gap, water years 1969-80.

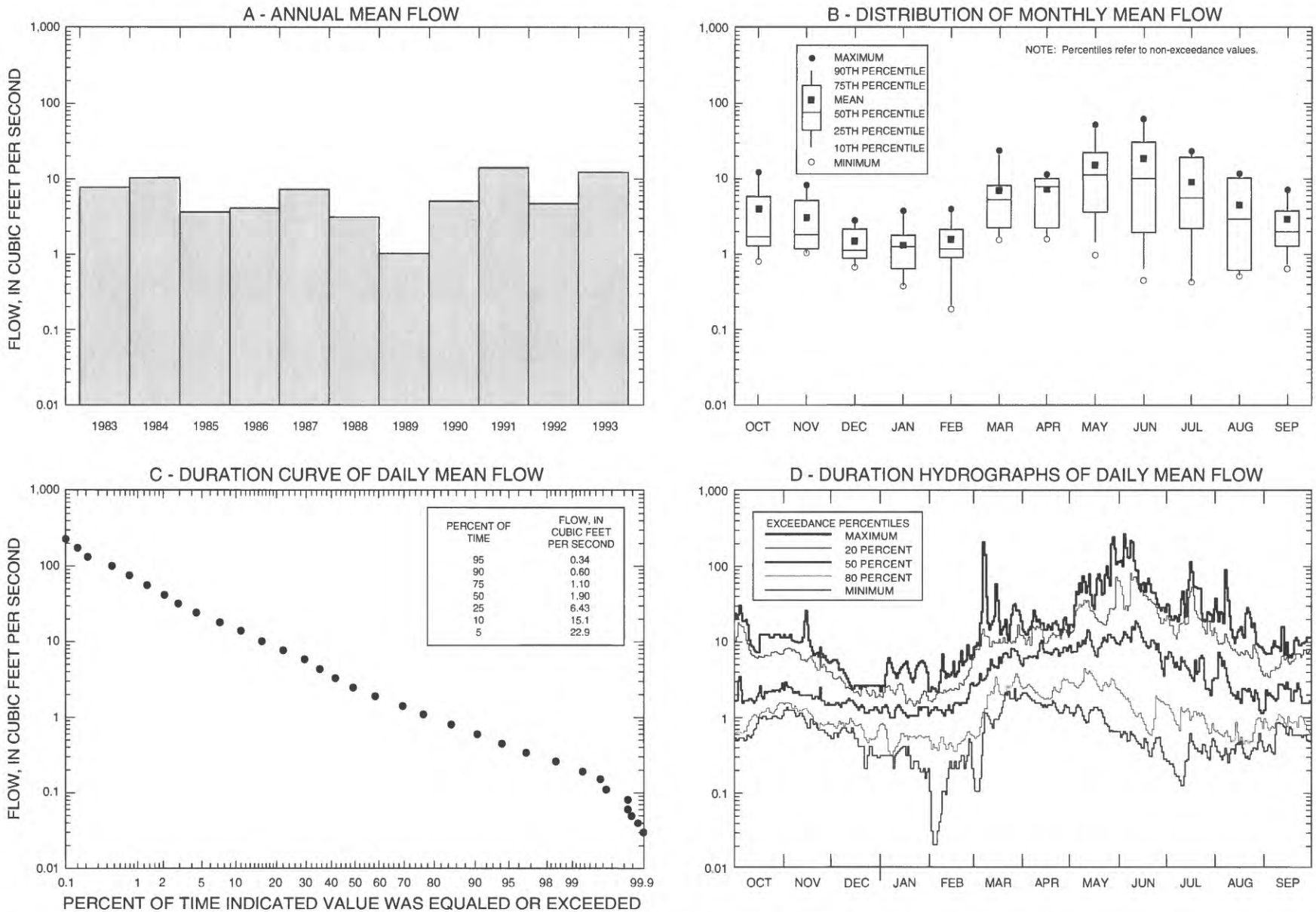


Figure F10. Variations in annual, monthly, and daily mean flow for station 06403300, French Creek above Fairburn, water years 1983-93.

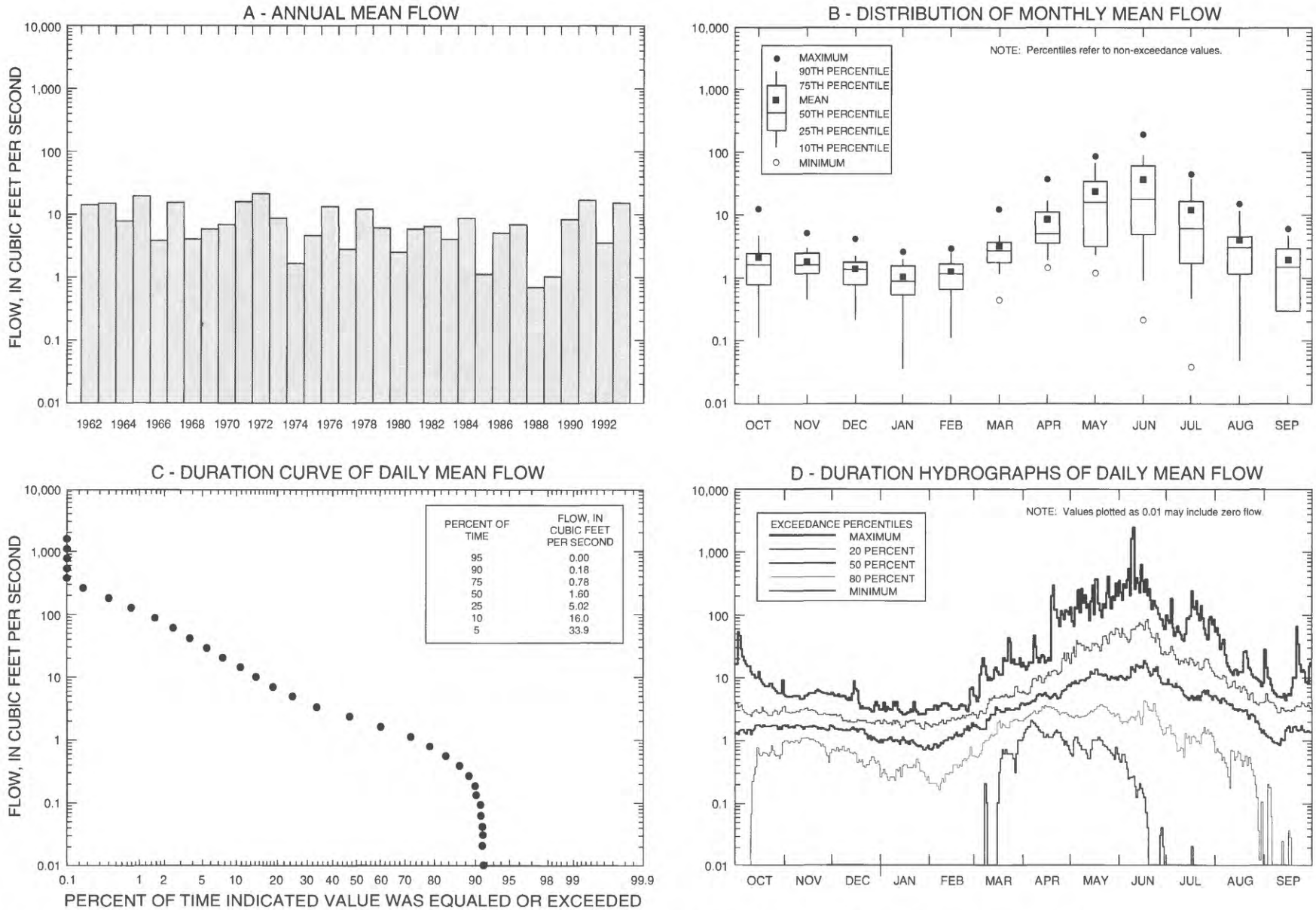


Figure F11. Variations in annual, monthly, and daily mean flow for station 06404000, Battle Creek near Keystone, water years 1962-93.

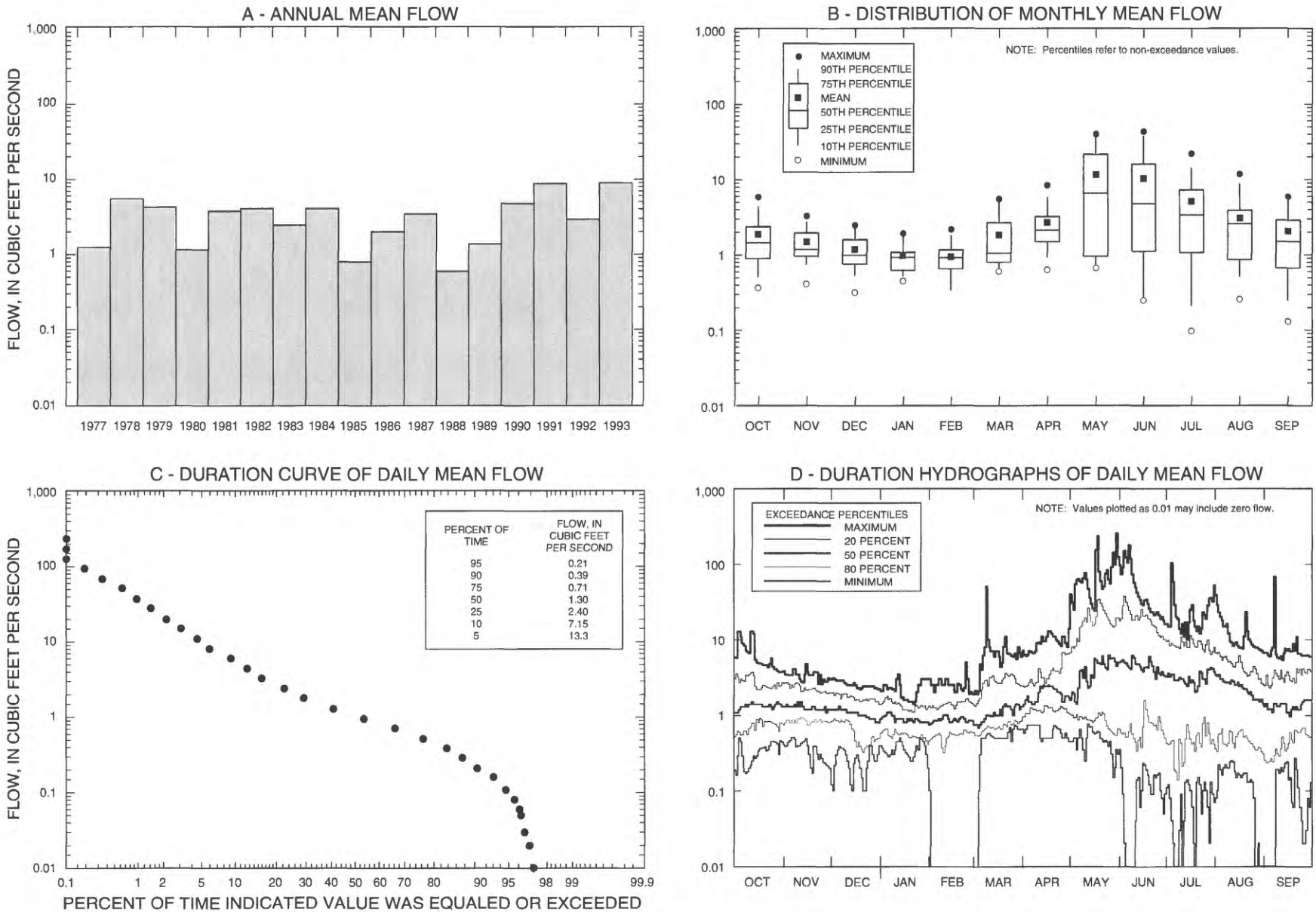


Figure F12. Variations in annual, monthly, and daily mean flow for station 06404998, Grace Coolidge Creek near Game Lodge, near Custer, water years 1977-93.

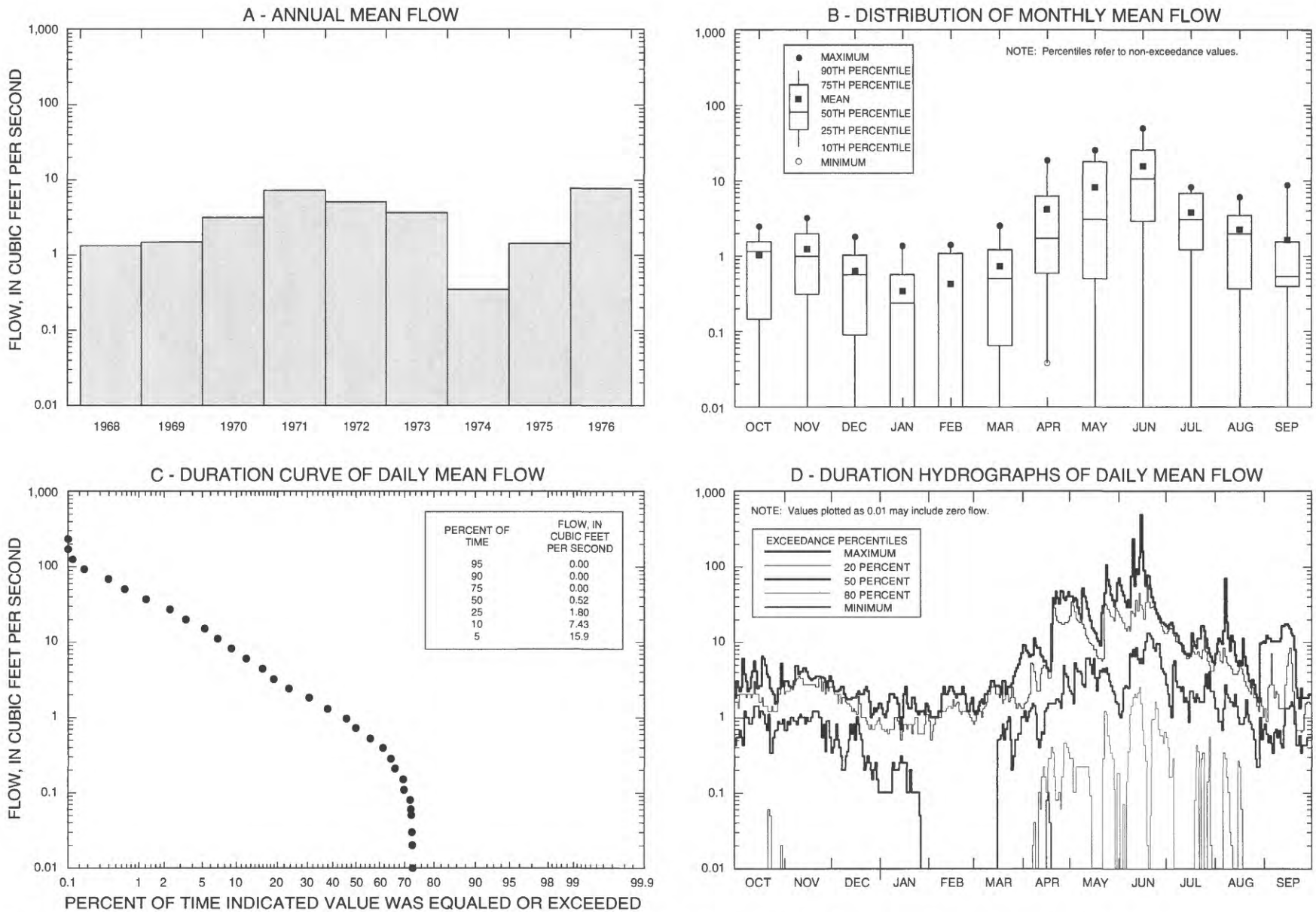


Figure F13. Variations in annual, monthly, and daily mean flow for station 06405000, Grace Coolidge Creek near Custer, water years 1968-76.

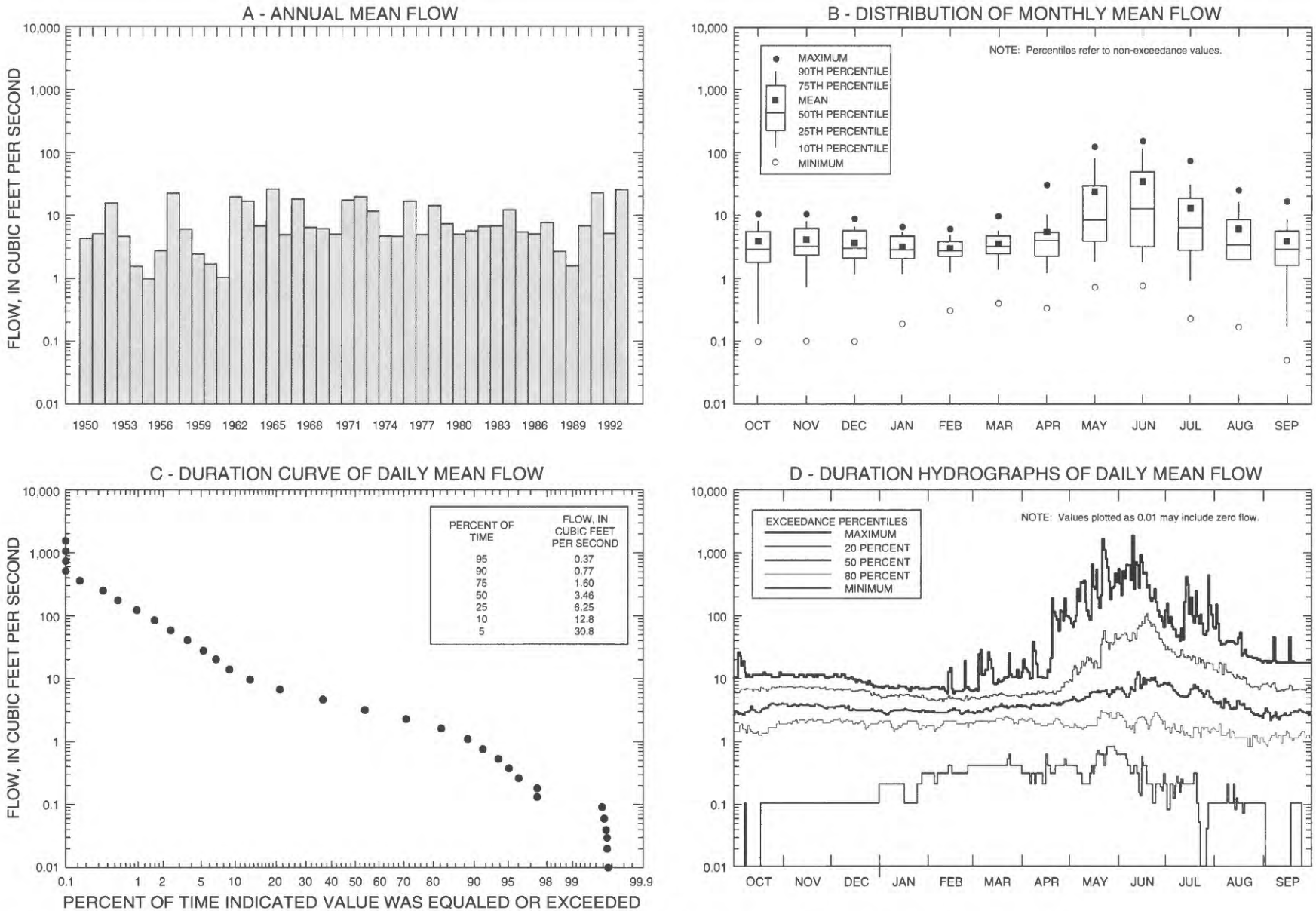


Figure F14. Variations in annual, monthly, and daily mean flow for station 06406000, Battle Creek at Hermosa, water years 1950-93.

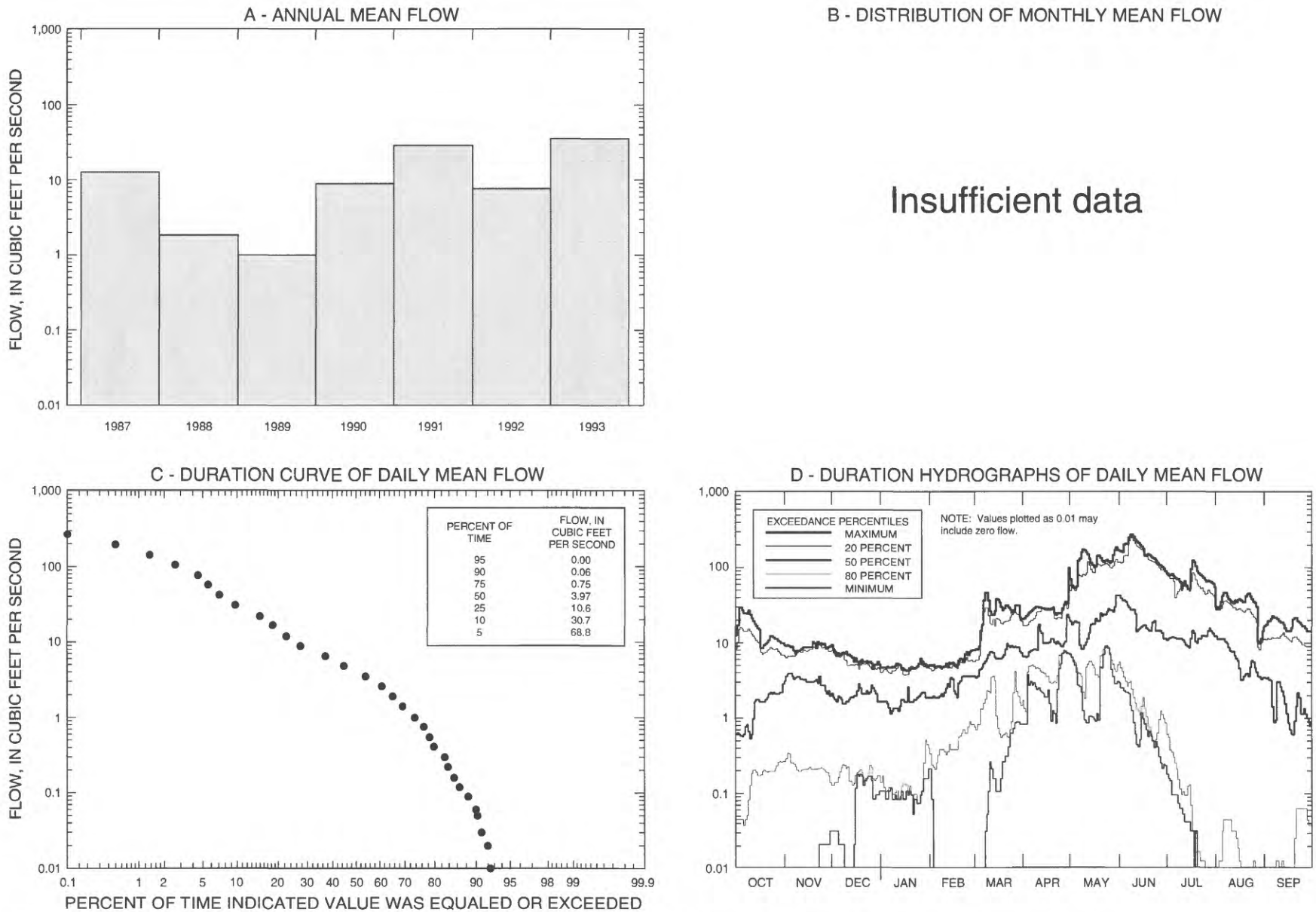


Figure F15. Variations in annual, monthly, and daily mean flow for station 06407500, Spring Creek near Keystone, water years 1987-93.

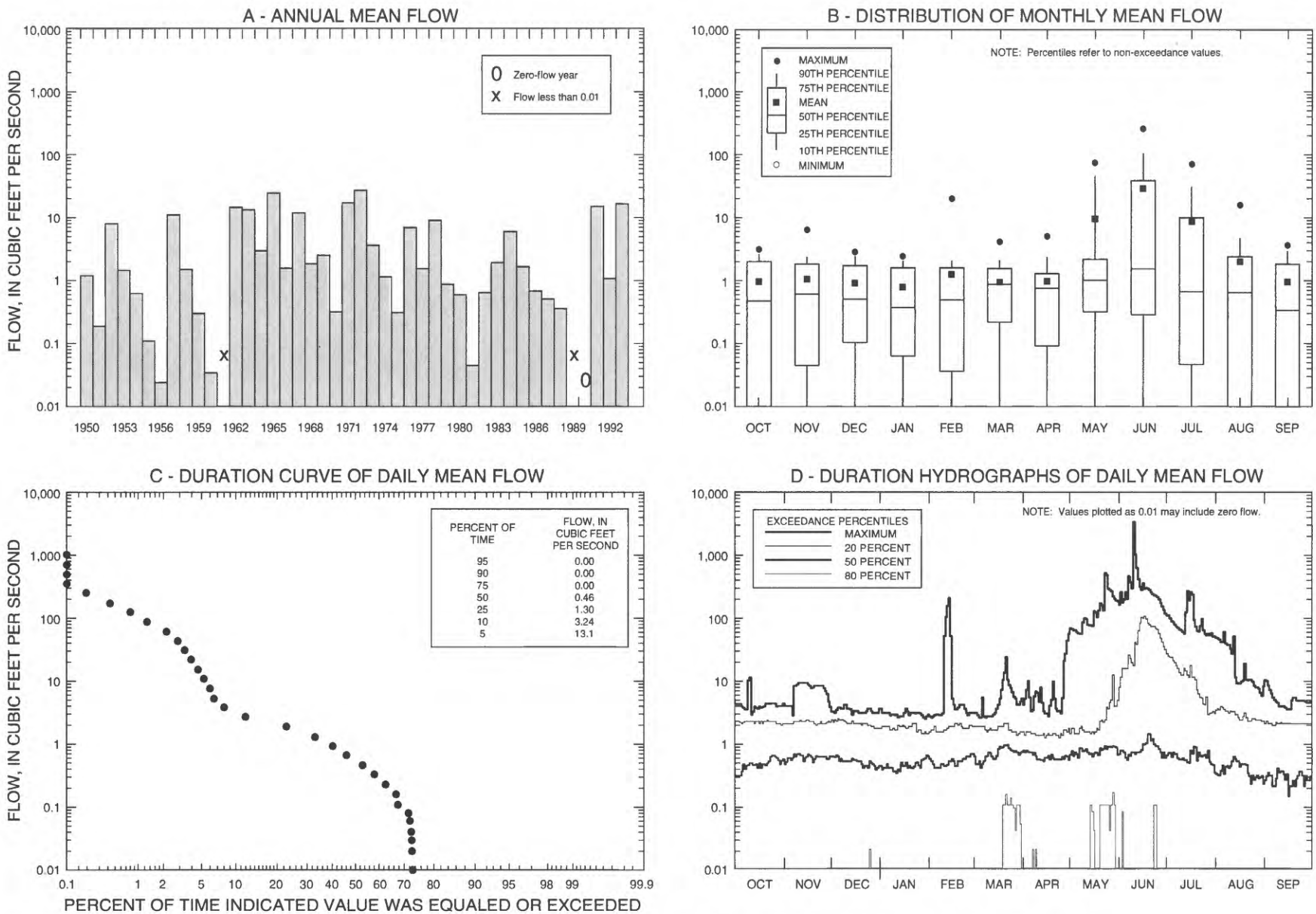


Figure F16. Variations in annual, monthly, and daily mean flow for station 06408500, Spring Creek near Hermosa, water years 1950-93.

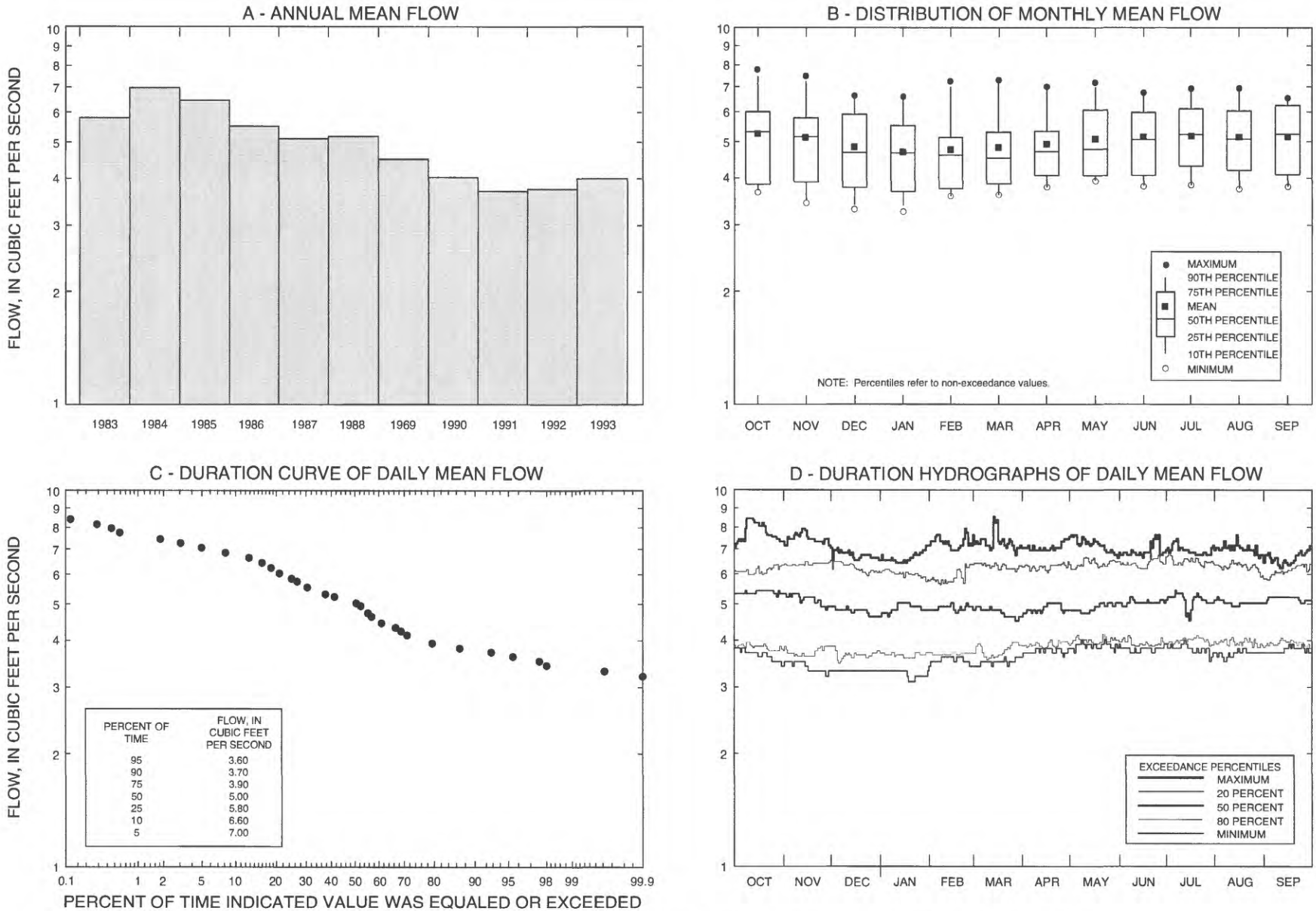


Figure F17. Variations in annual, monthly, and daily mean flow for station 06408700, Rhoads Fork near Rochford, water years 1983-93.

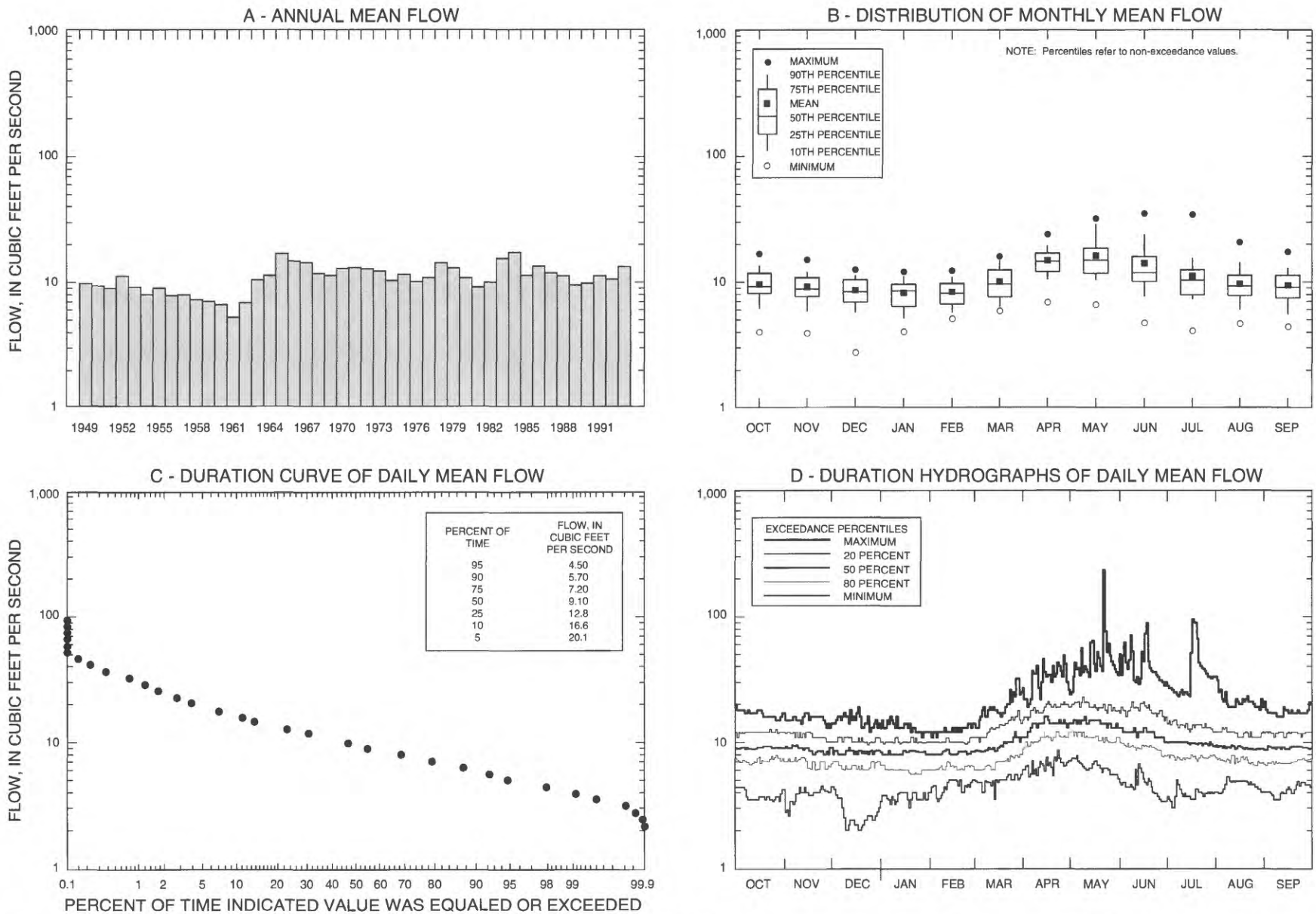


Figure F18. Variations in annual, monthly, and daily mean flow for station 06409000, Castle Creek above Deerfield Reservoir, near Hill City, water years 1949-93.

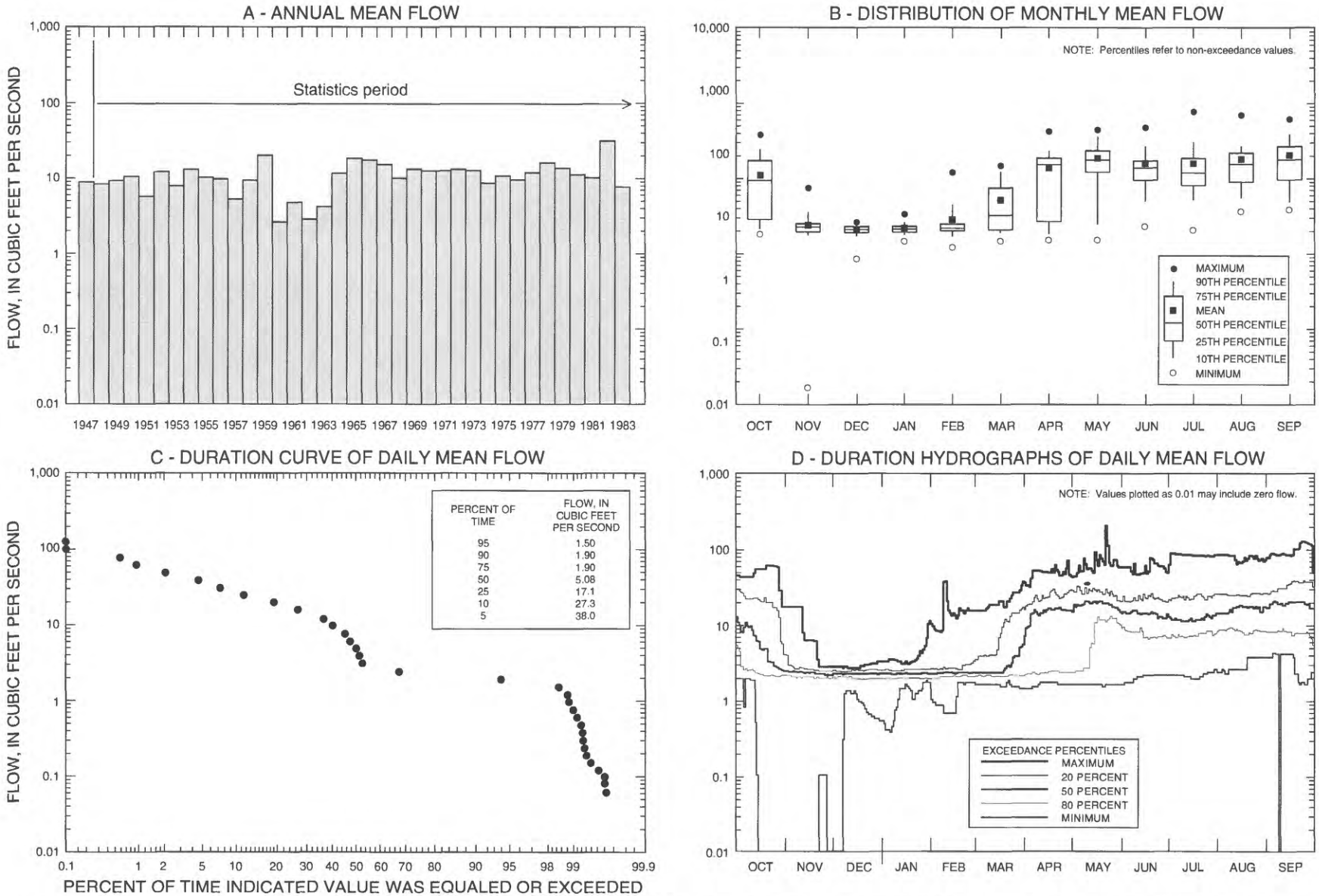


Figure F19. Variations in annual, monthly, and daily mean flow for station 06410000, Castle Creek below Deerfield Dam, water years 1948-83 (annual hydrograph for water years 1947-83).

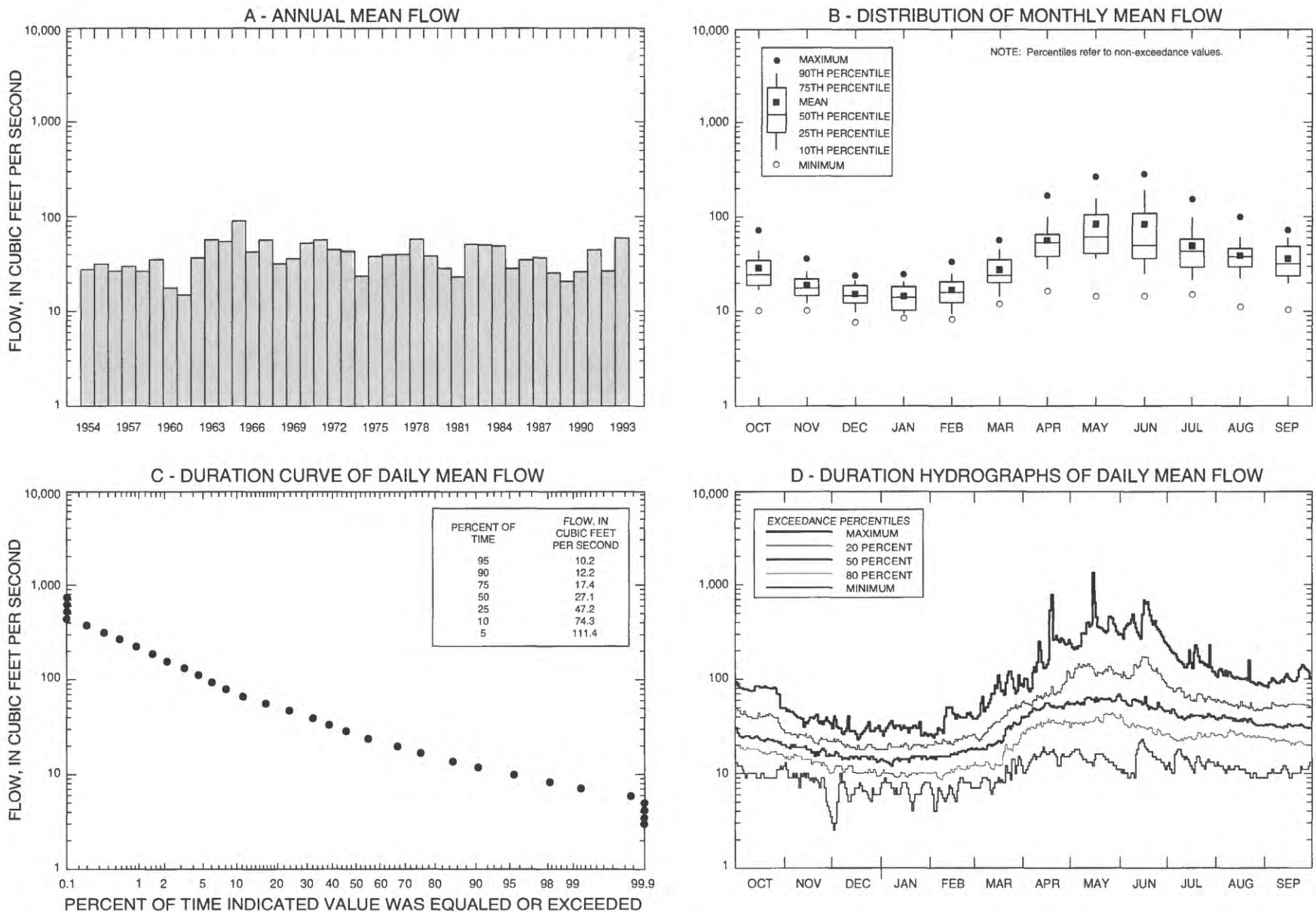


Figure F20. Variations in annual, monthly, and daily mean flow for station 06410500, Rapid Creek above Pactola Reservoir, at Silver City, water years 1954-93.

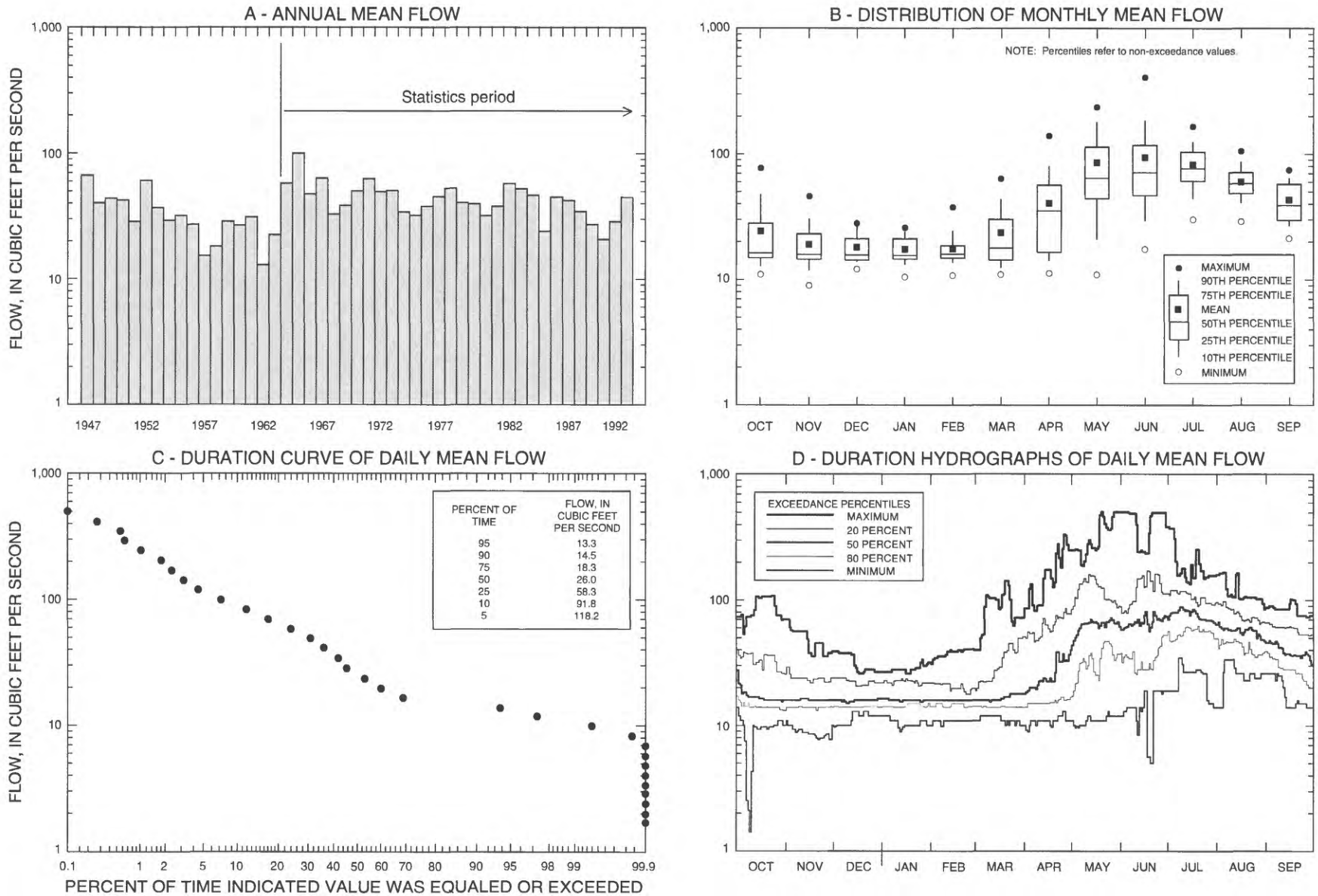
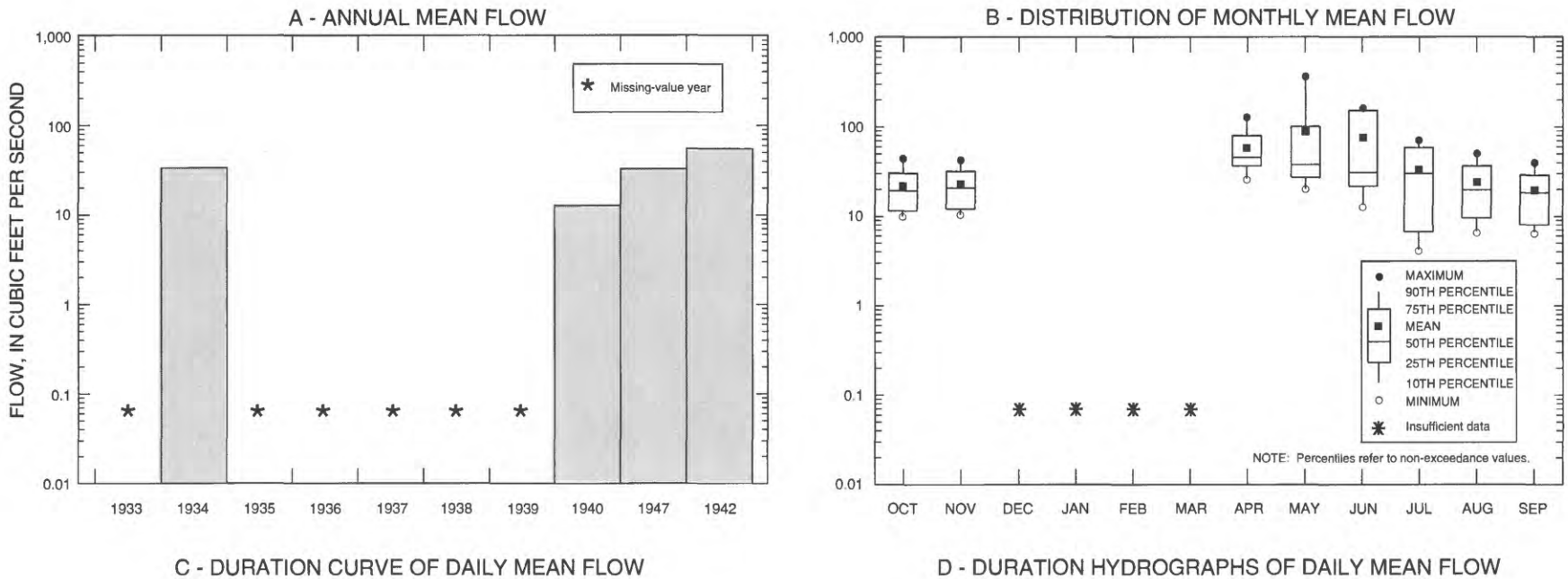


Figure F21. Variations in annual, monthly, and daily mean flow for station 06411500, Rapid Creek below Pactola Dam, water years 1964-93 (annual hydrograph for water years 1947-93).



Duration curve not presented

Duration hydrograph not presented

Figure F22. Variations in annual, monthly, and daily mean flow for station 06412000, Rapid Creek at Big Bend, water years 1933-42.

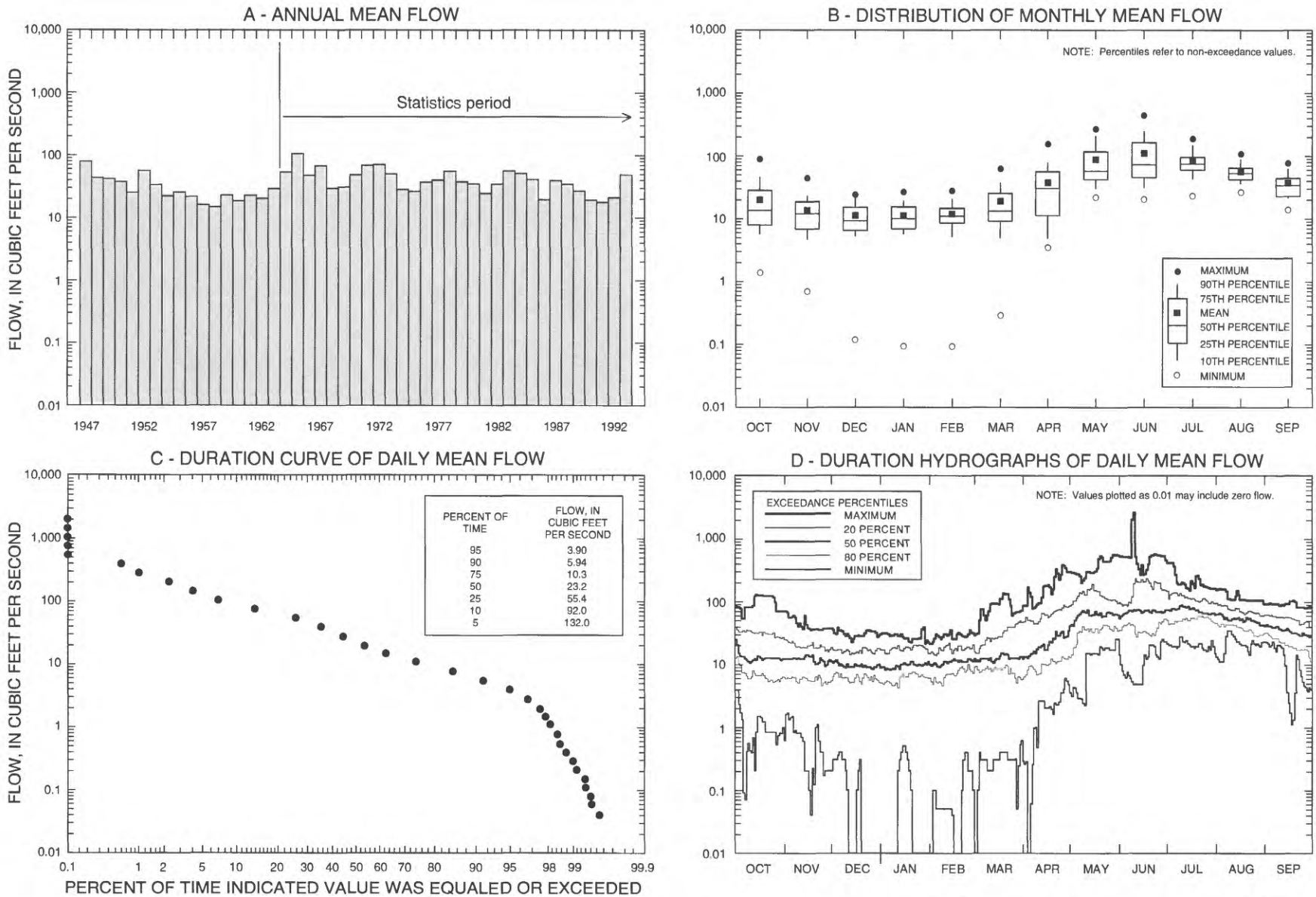


Figure F23. Variations in annual, monthly, and daily mean flow for station 06412500, Rapid Creek above Canyon Lake, near Rapid City, water years 1964-93 (annual hydrograph for water years 1947-93).

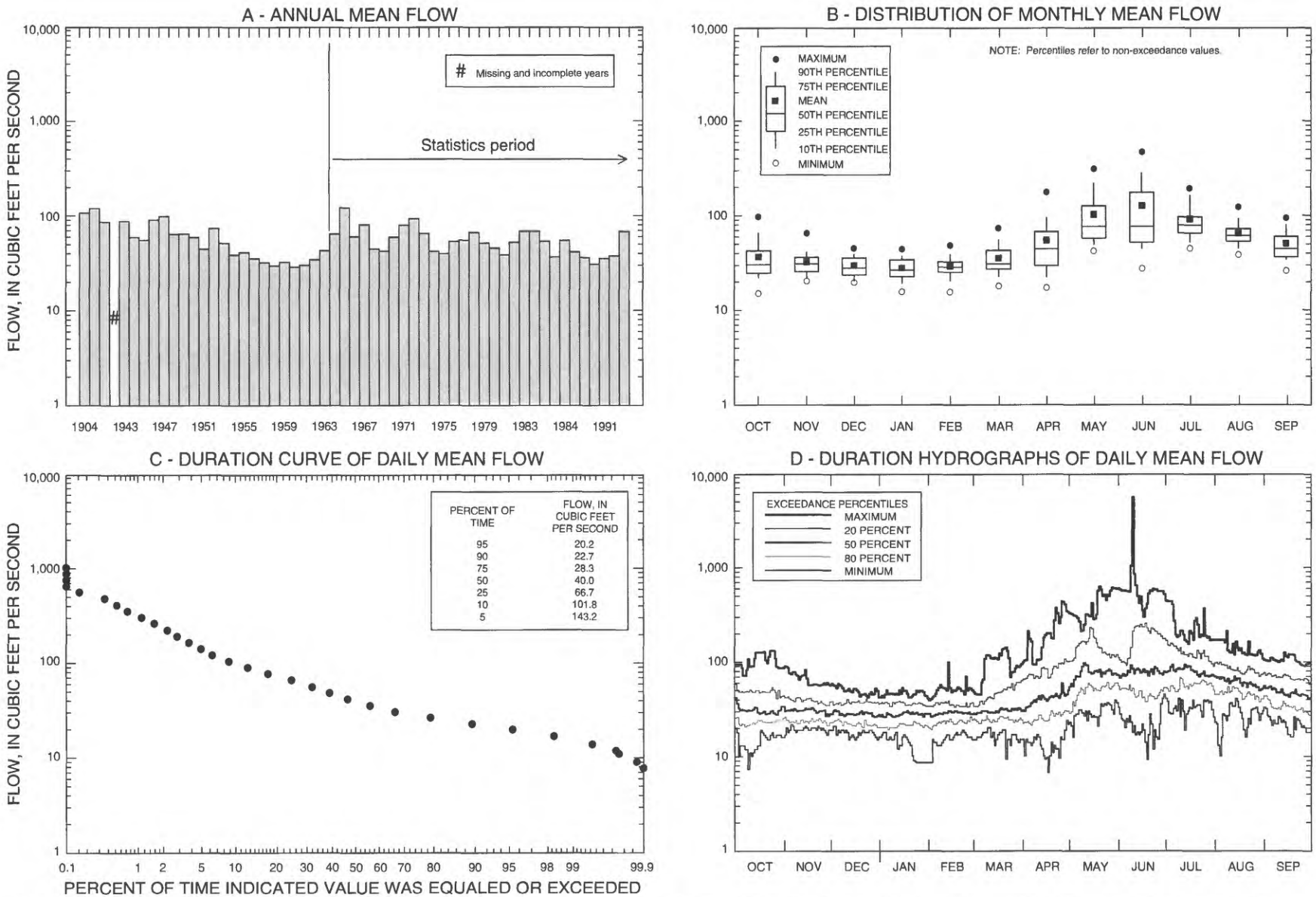


Figure F24. Variations in annual, monthly, and daily mean flow for station 06414000, Rapid Creek at Rapid City, water years 1964-93 (annual hydrograph for water years 1904-06, 1943-93).

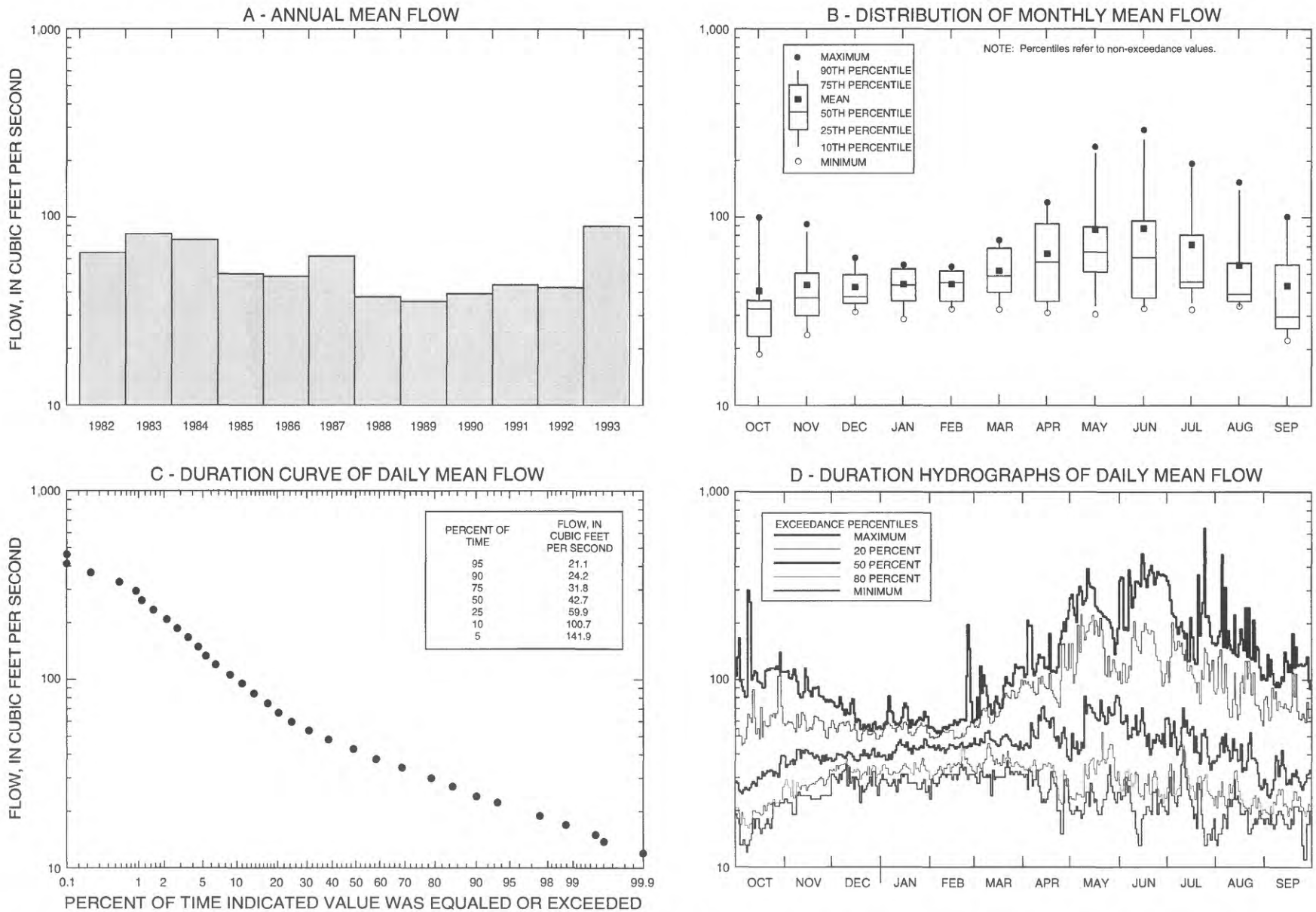


Figure F25. Variations in annual, monthly, and daily mean flow for station 06418900, Rapid Creek below Sewage Plant, near Rapid City, water years 1982-93.

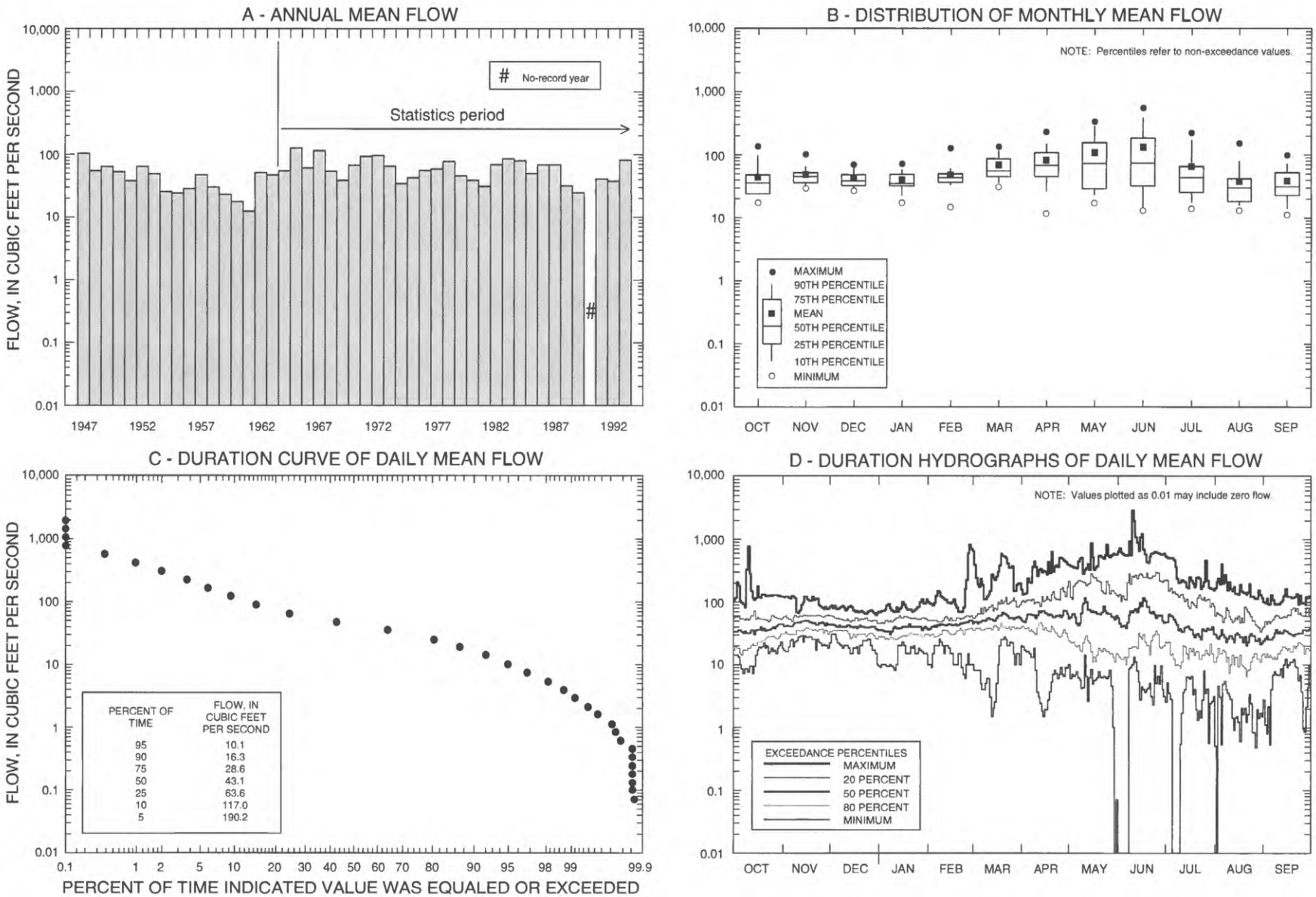


Figure F26. Variations in annual, monthly, and daily mean flow for station 06421500, Rapid Creek near Farmingdale, water years 1964-93 (annual hydrograph for water years 1947-93).

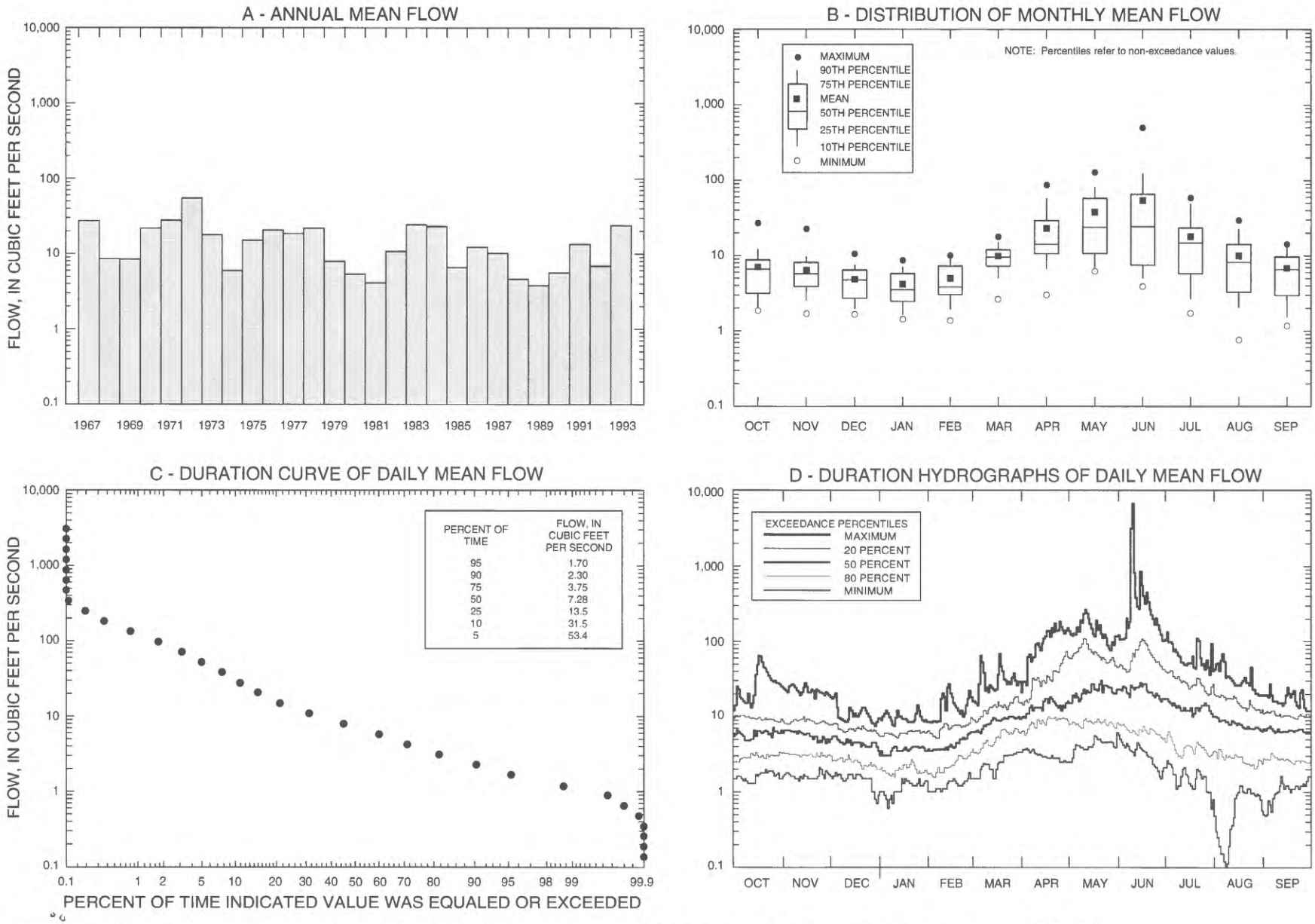


Figure F27. Variations in annual, monthly, and daily mean flow for station 06422500, Boxelder Creek near Nemo, water years 1967-93.

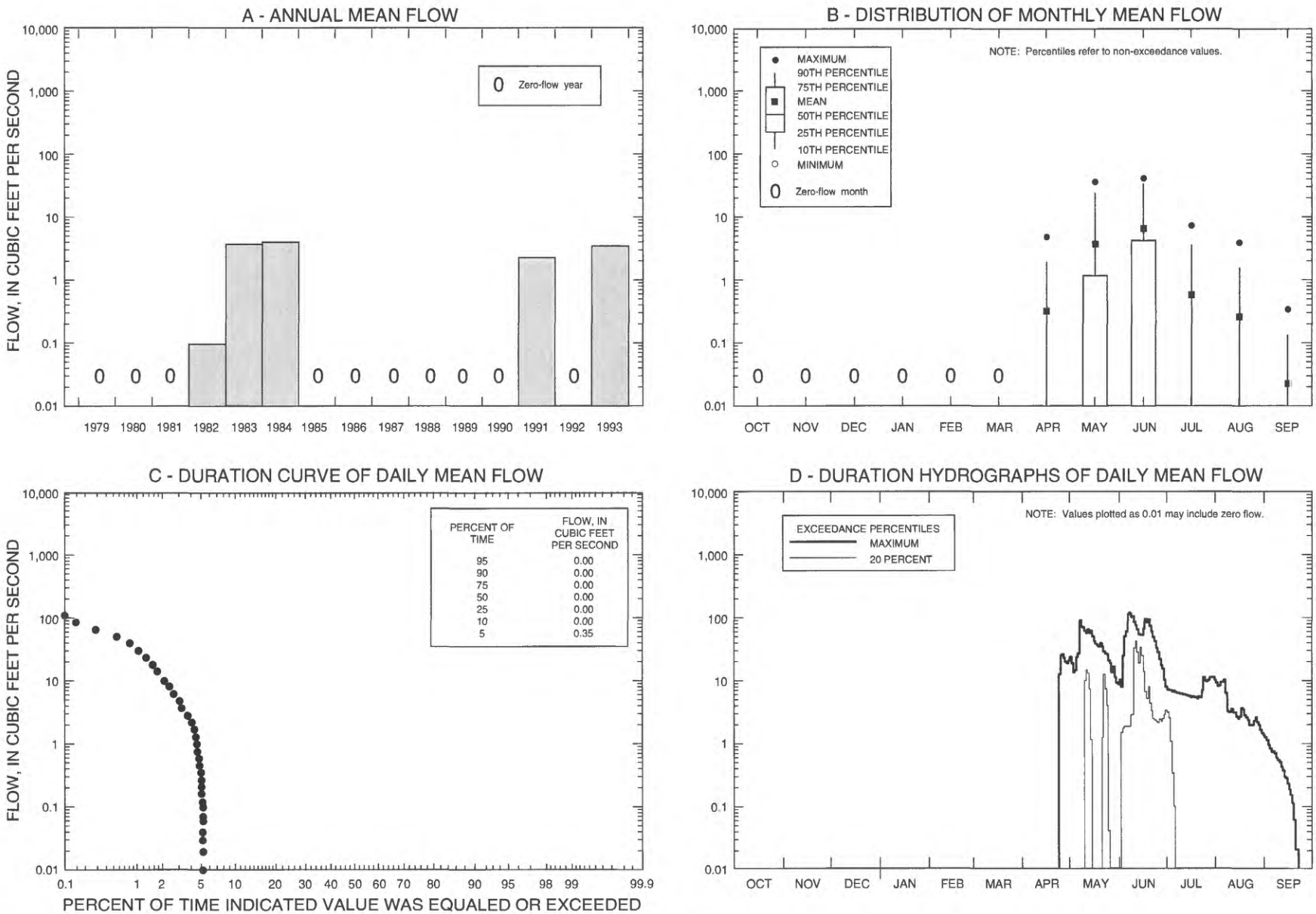


Figure F28. Variations in annual, monthly, and daily mean flow for station 06423010, Boxelder Creek near Rapid City, water years 1979-93.

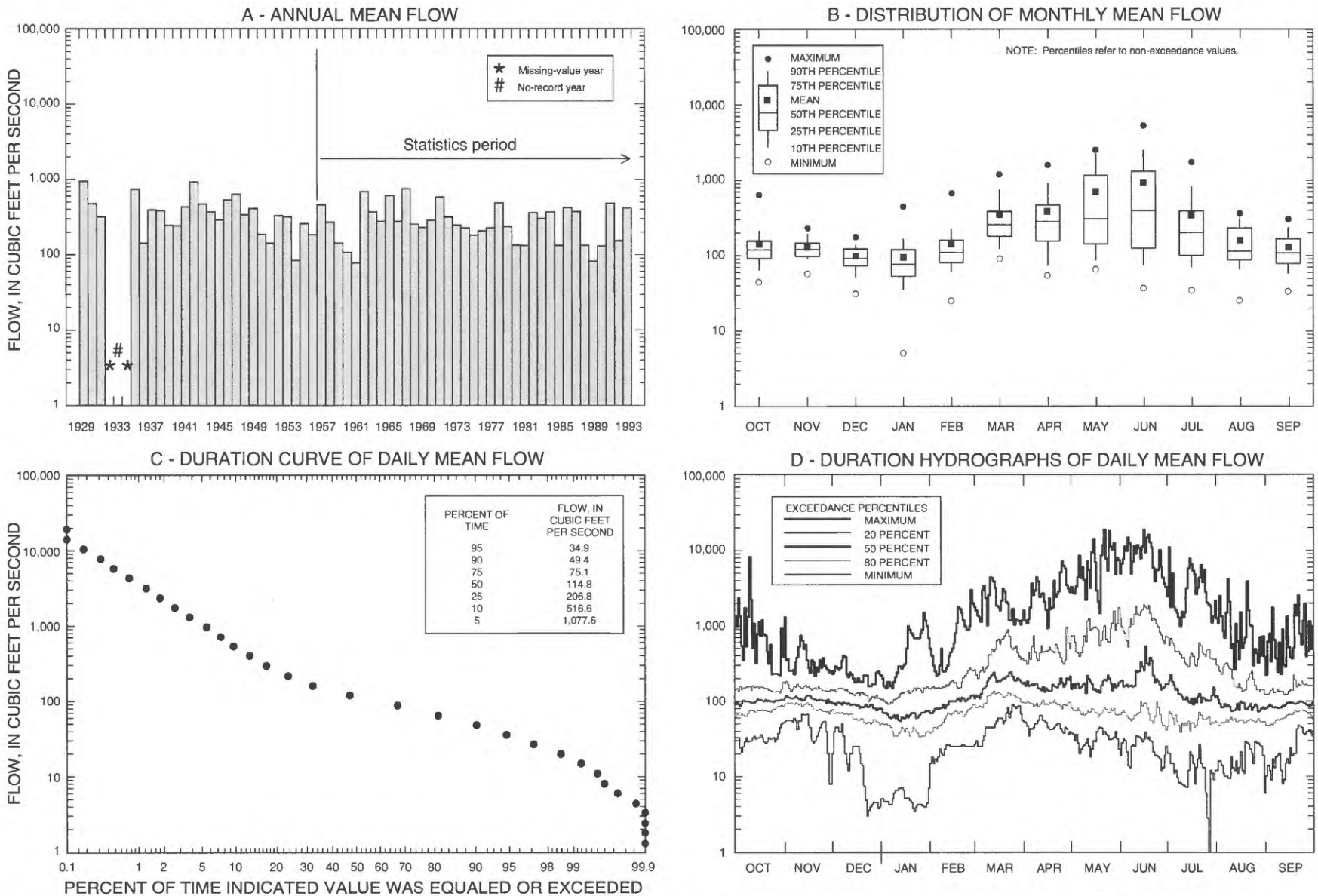


Figure F29. Variations in annual, monthly, and daily mean flow for station 06423500, Cheyenne River near Wasta, water years 1957-93 (annual hydrograph for water years 1929-93).

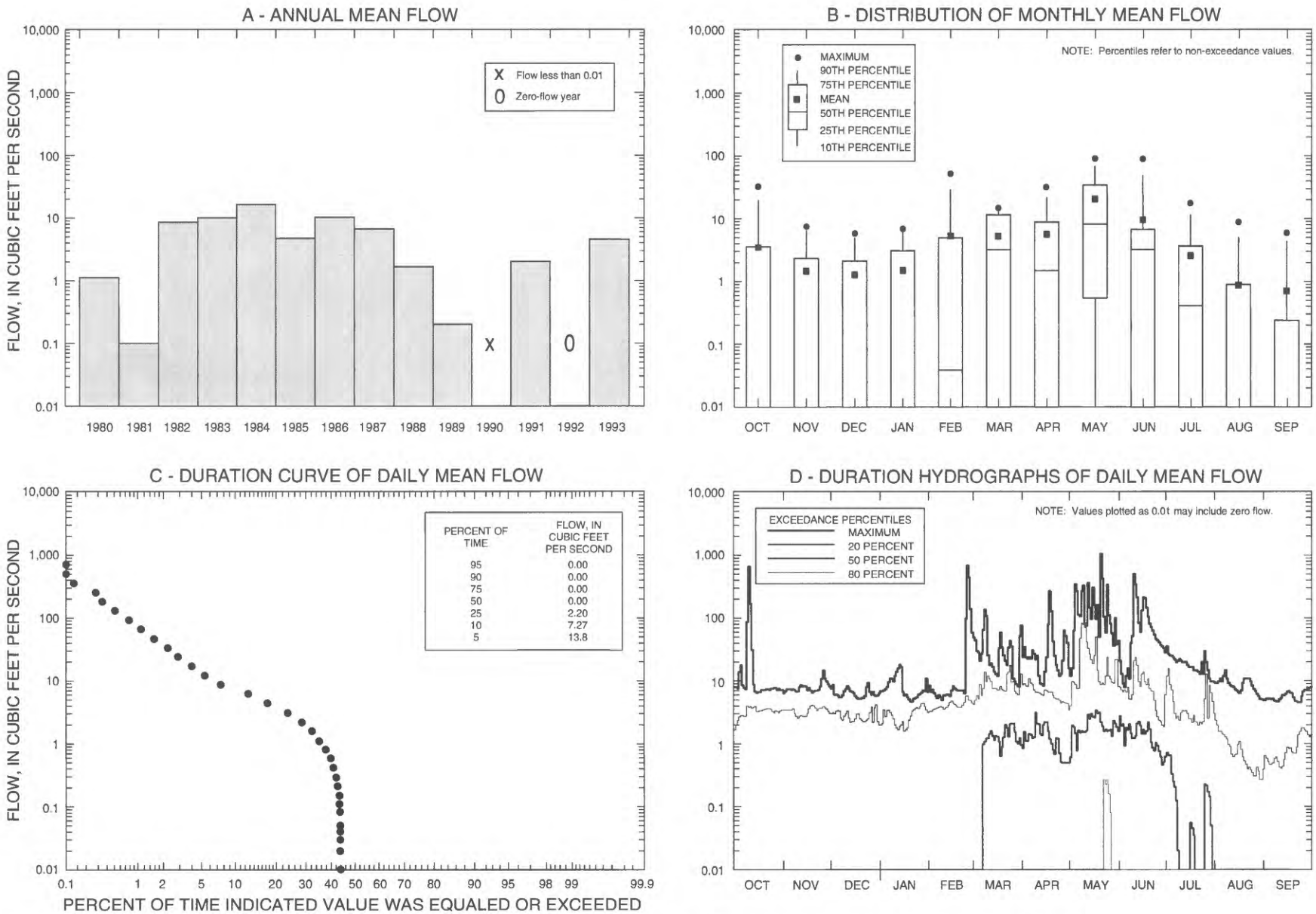


Figure F30. Variations in annual, monthly, and daily mean flow for station 06425100, Elk Creek near Rapid City, water years 1980-93.

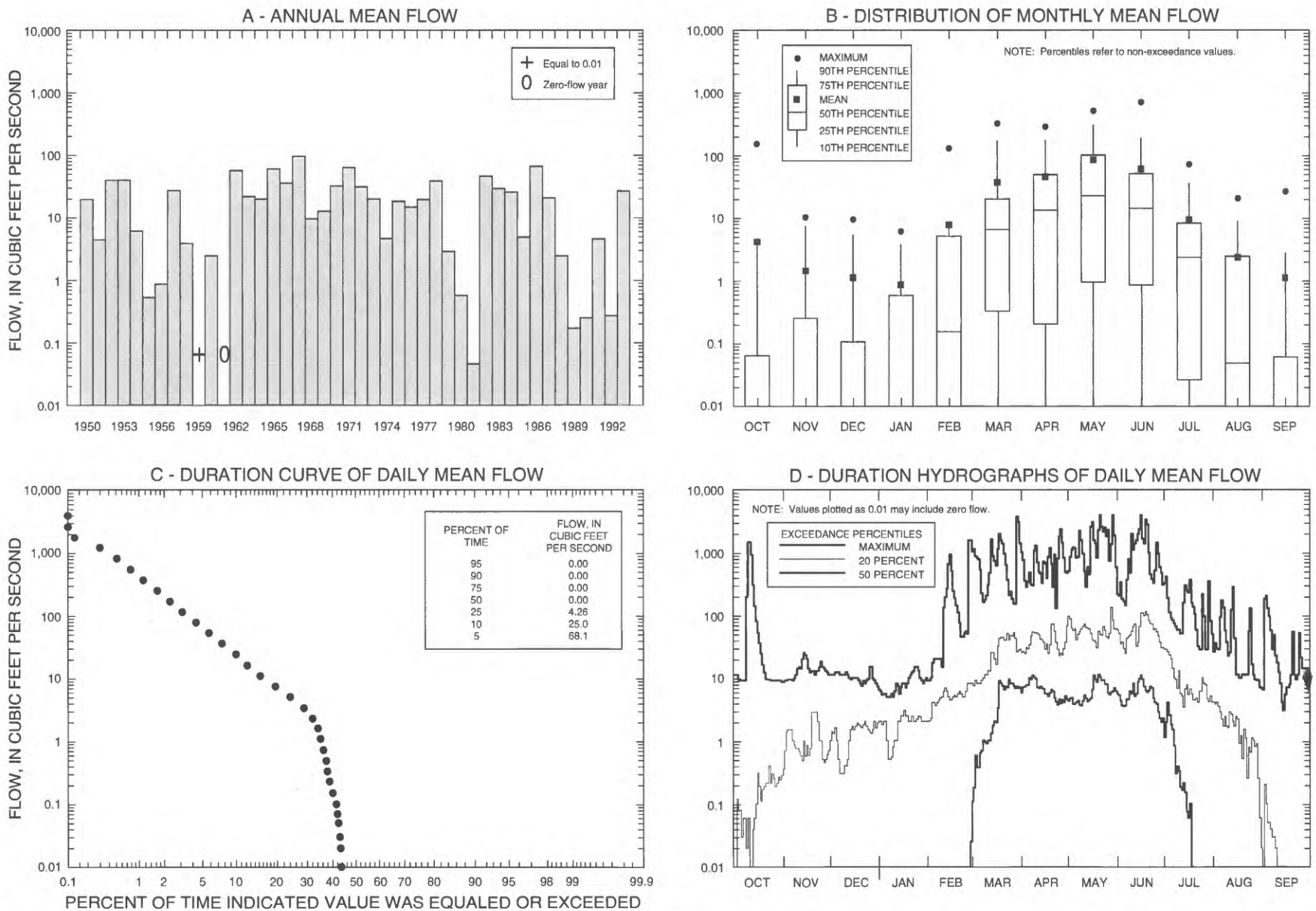


Figure F31. Variations in annual, monthly, and daily mean flow for station 06425500, Elk Creek near Elm Springs, water years 1950-93.

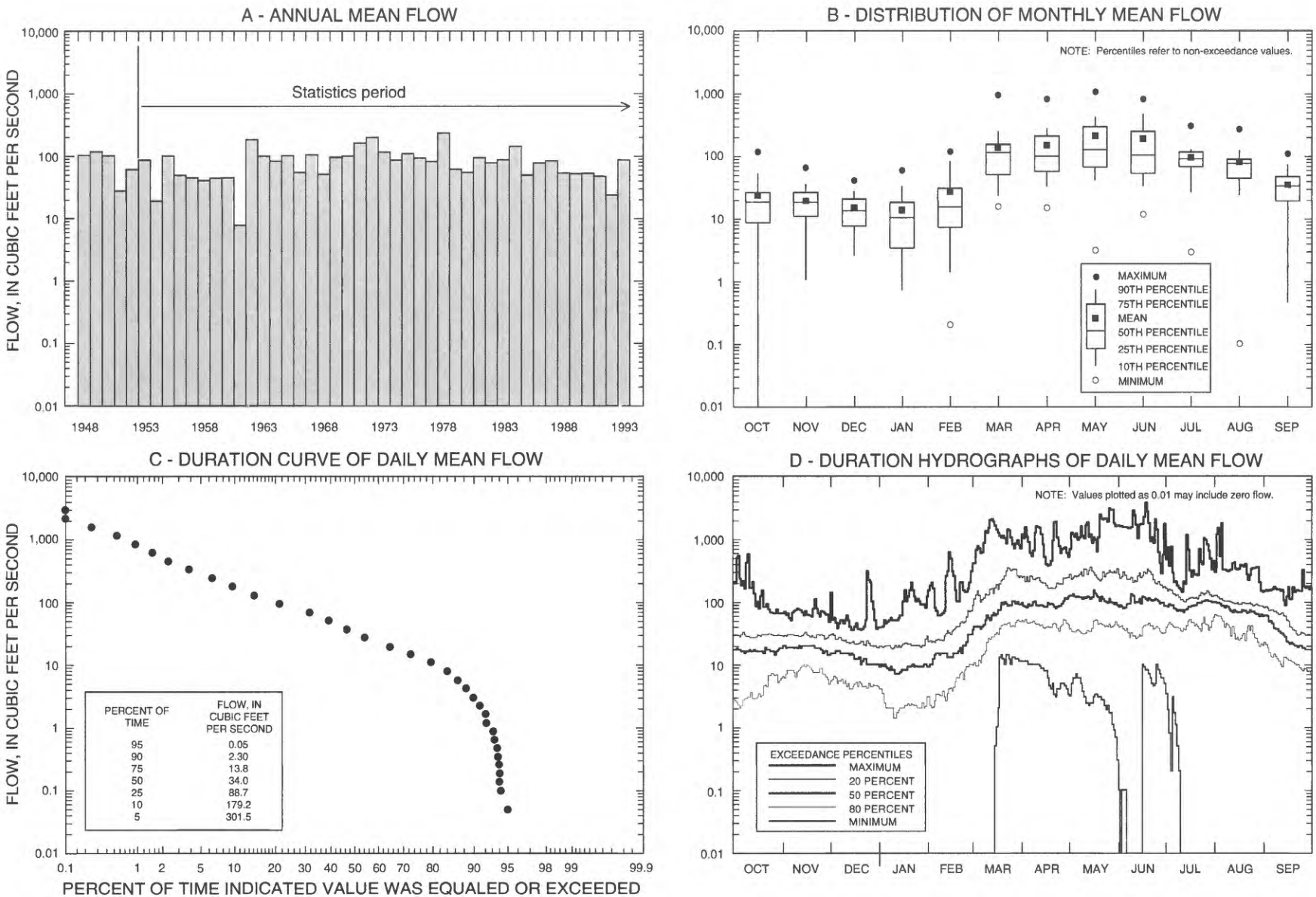


Figure F32. Variations in annual, monthly, and daily mean flow for station 06428500, Belle Fourche River at Wyoming-South Dakota State line, water years 1953-93 (annual hydrograph for water years 1948-93).

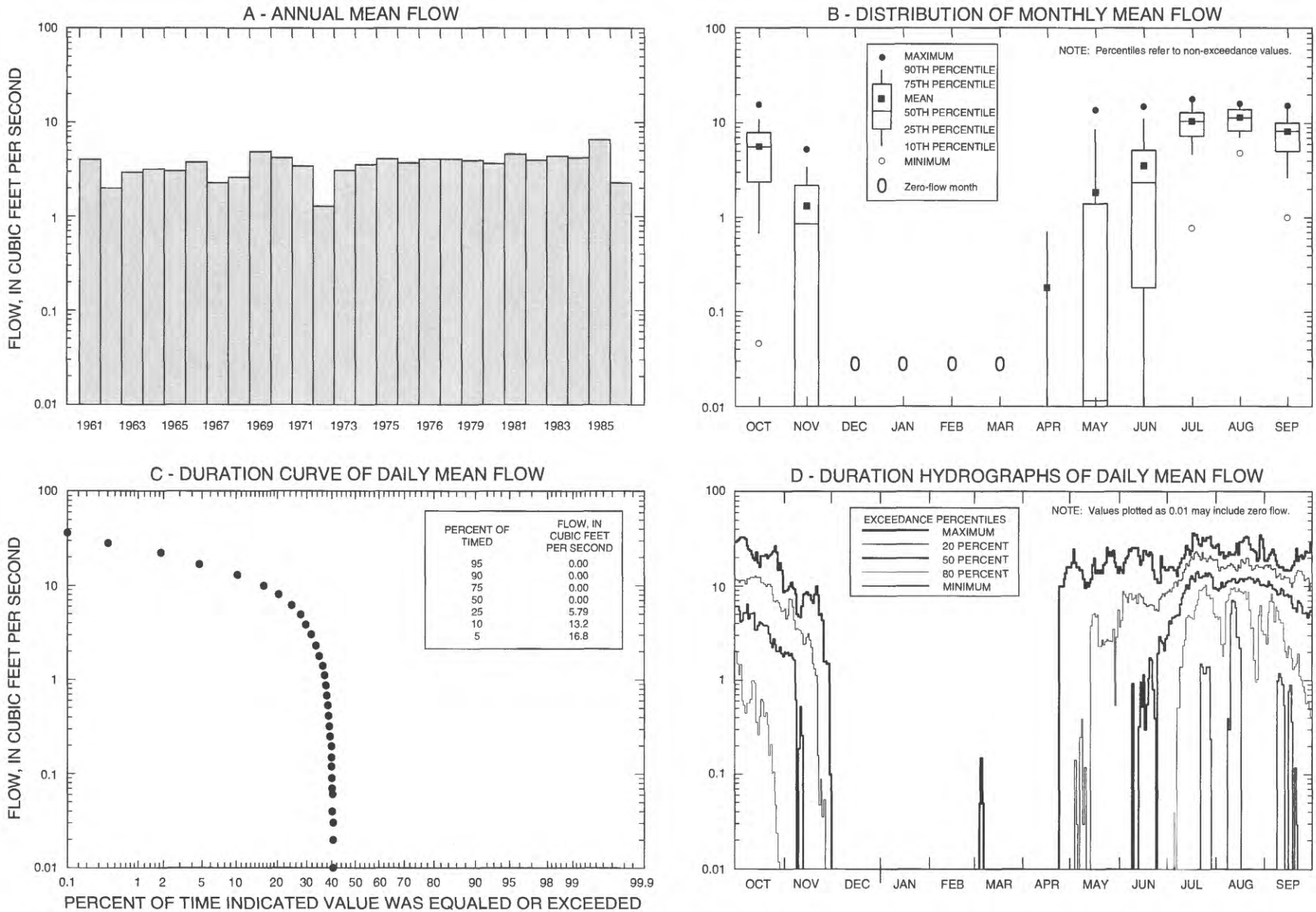


Figure F33. Variations in annual, monthly, and daily mean flow for station 06430000, Murray Ditch at Wyoming-South Dakota State line, water years 1961-86.

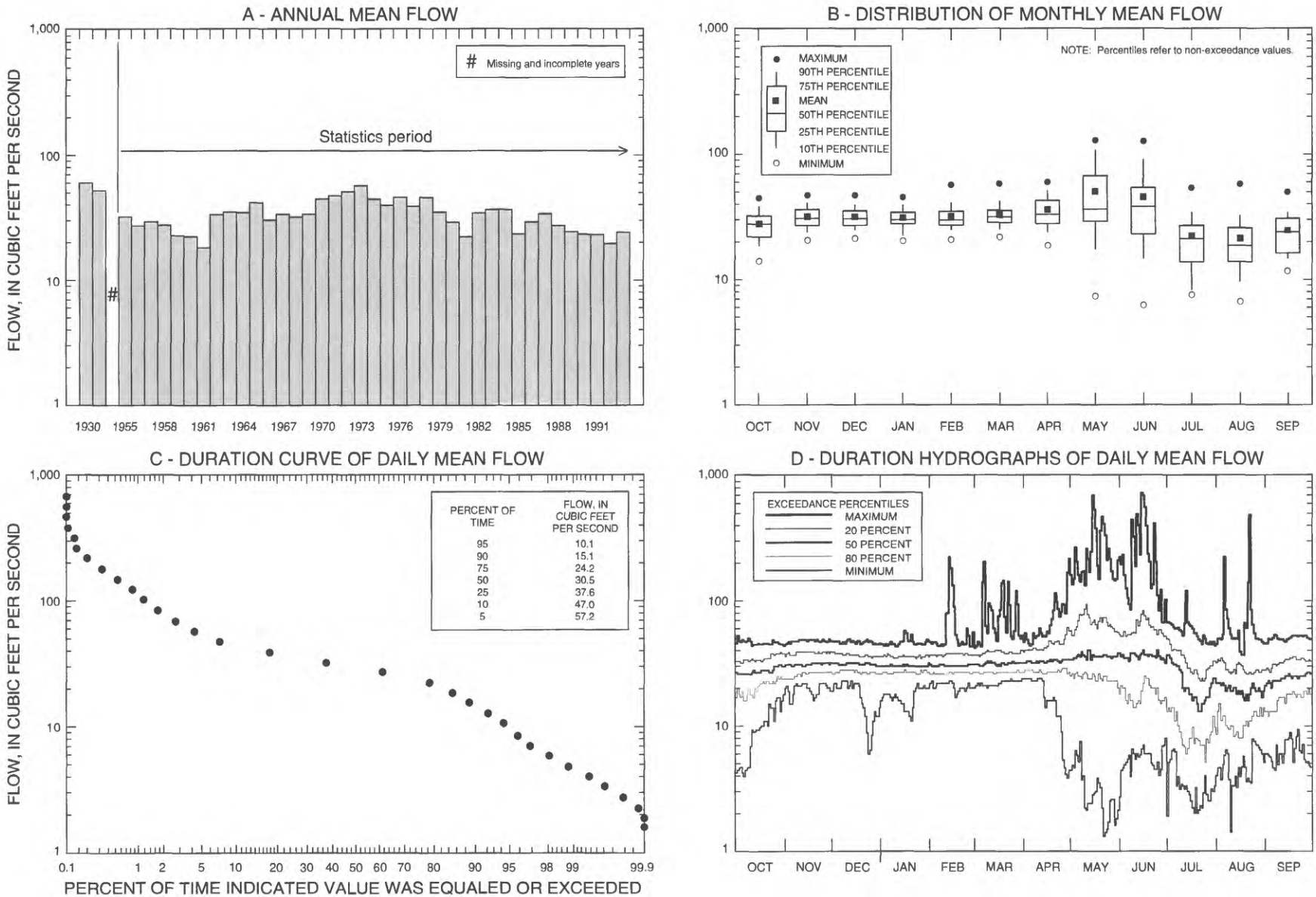


Figure F34. Variations in annual, monthly, and daily mean flow for station 06430500, Redwater Creek at Wyoming-South Dakota State line, water years 1955-93 (annual hydrograph for water years 1930-31, 1955-93).

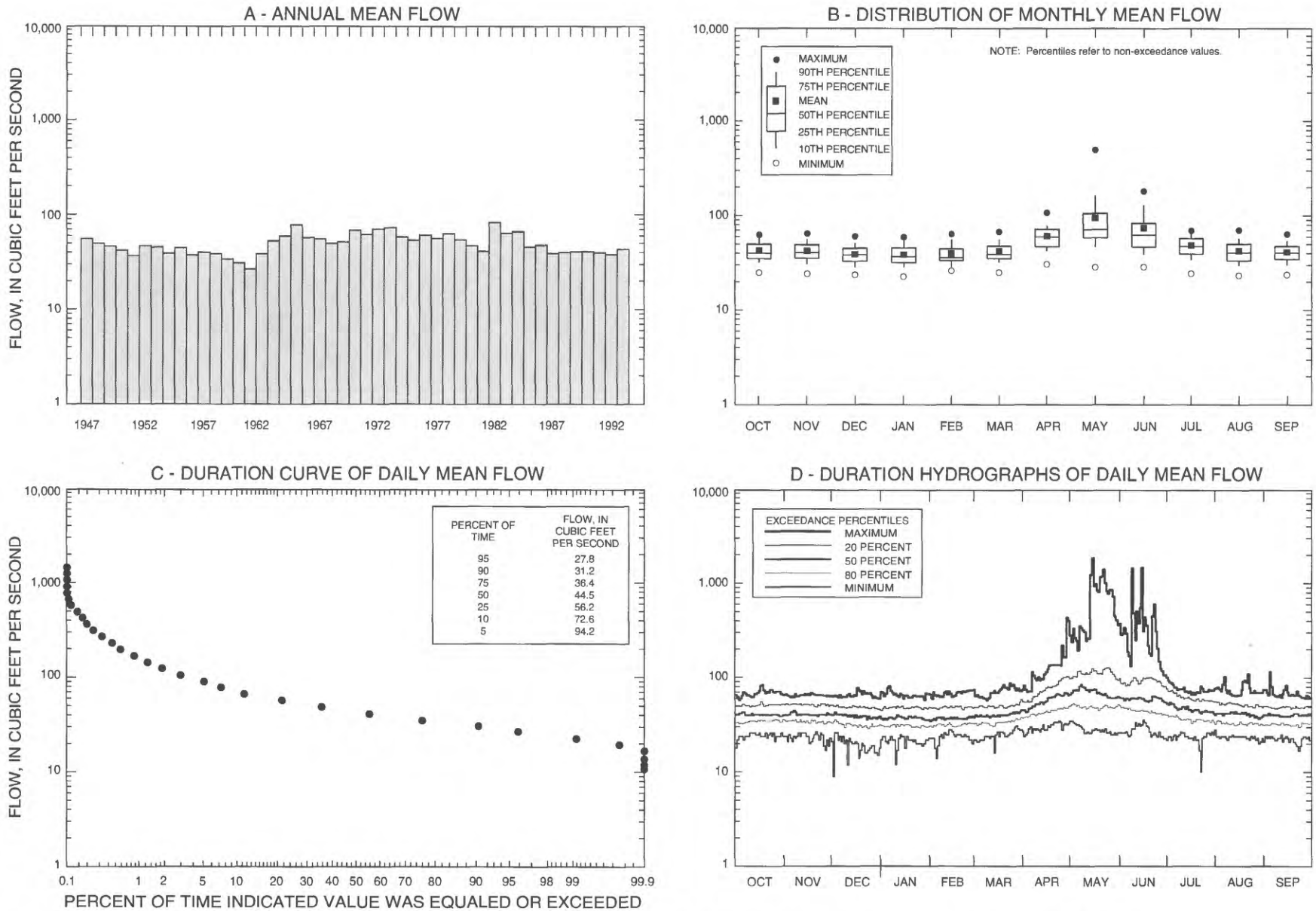


Figure F35. Variations in annual, monthly, and daily mean flow for station 06431500, Spearfish Creek at Spearfish, water years 1947-93.

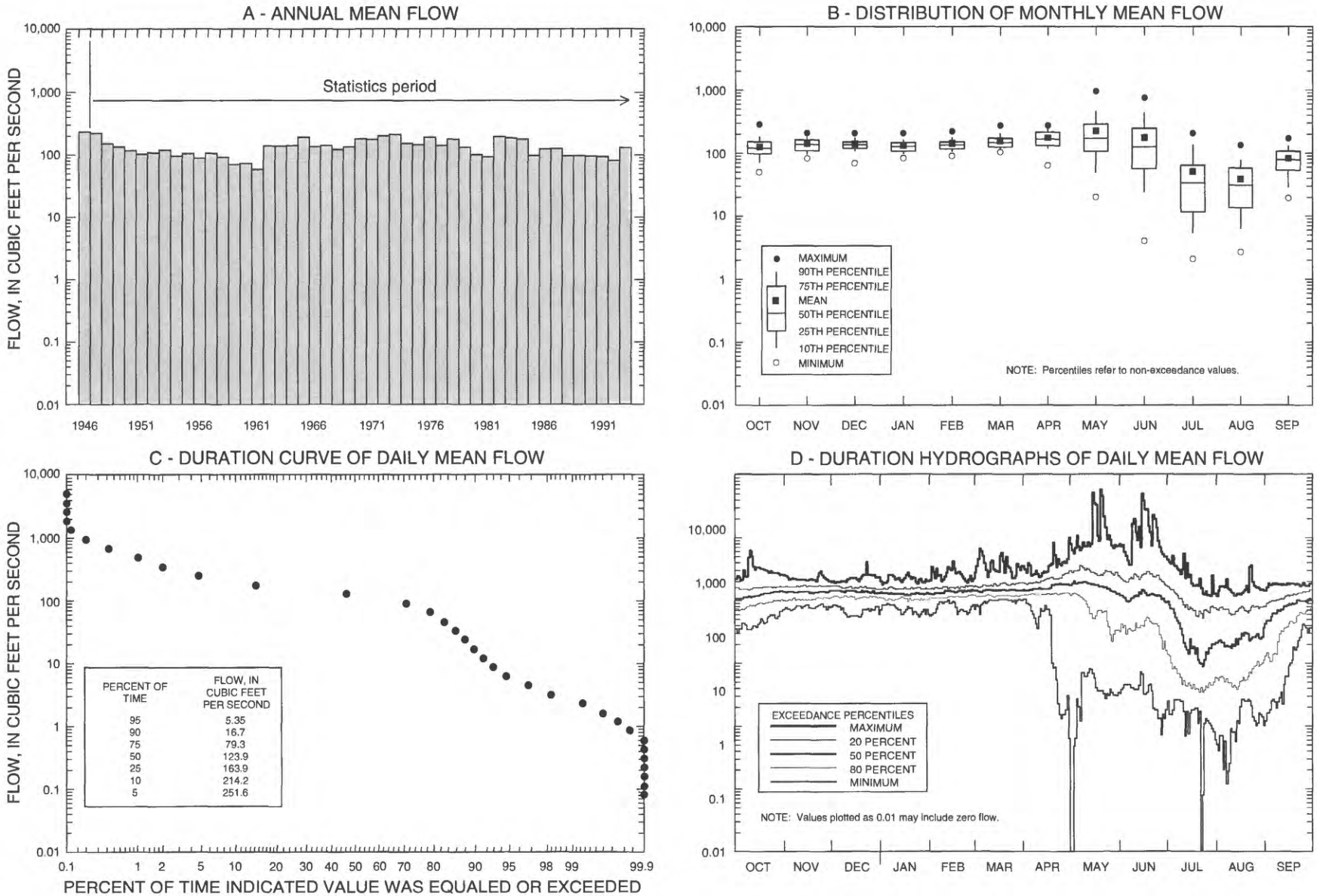


Figure F36. Variations in annual, monthly, and daily mean flow for station 06433000, Redwater River above Belle Fourche, water years 1947-93 (annual hydrograph for water years 1946-93).

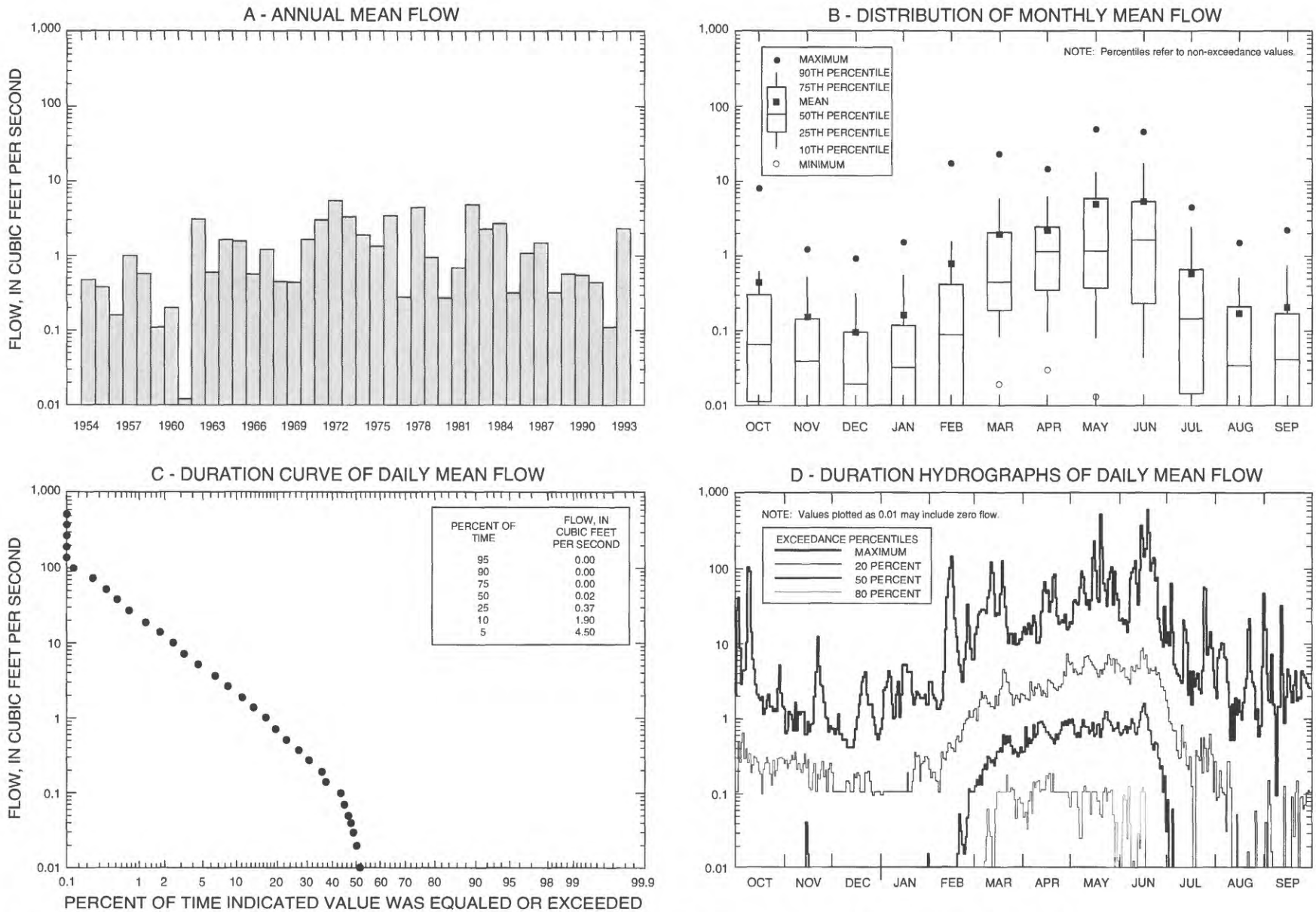


Figure F37. Variations in annual, monthly, and daily mean flow for station 06433500, Hay Creek at Belle Fourche, water years 1954-93.

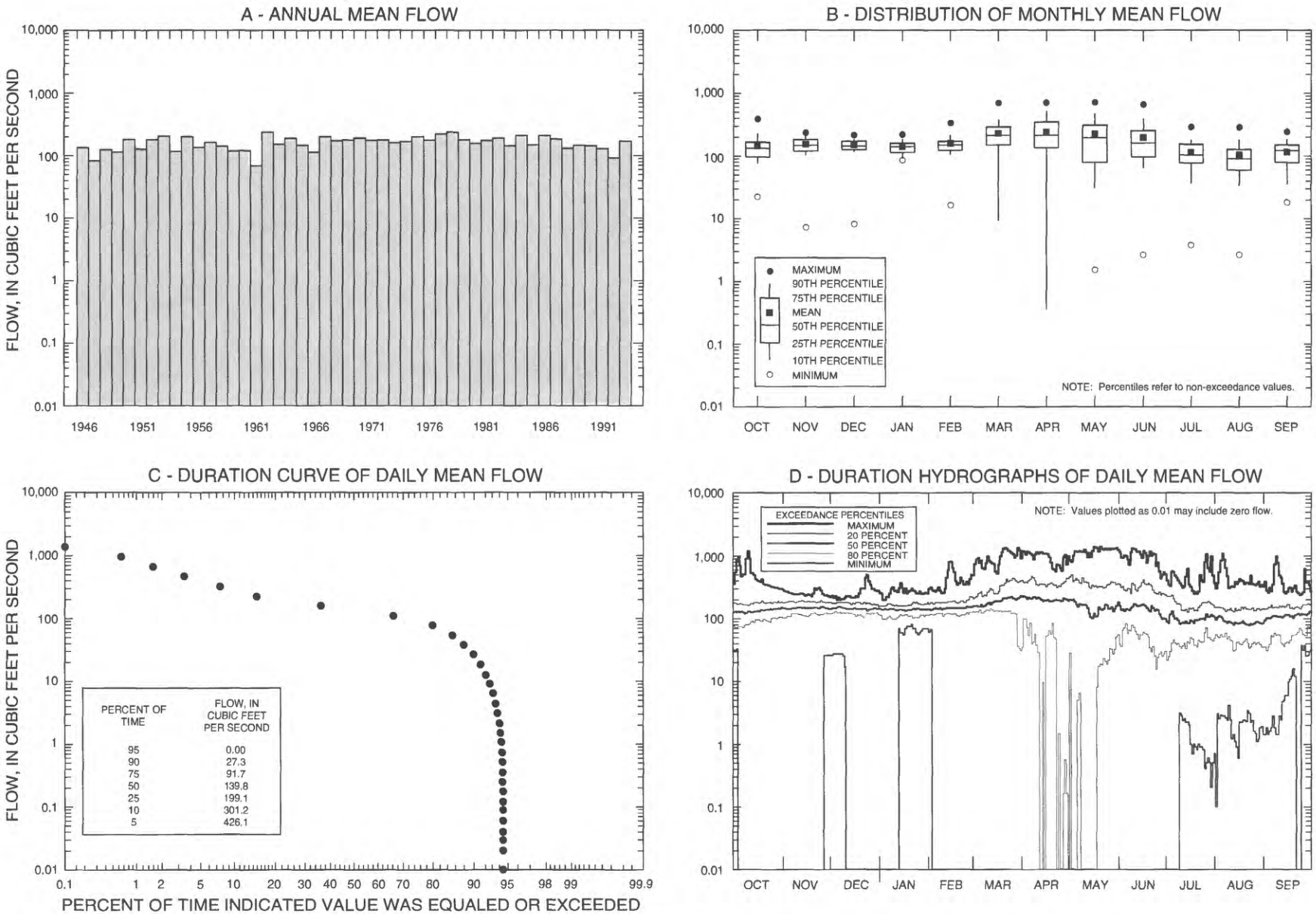


Figure F38. Variations in annual, monthly, and daily mean flow for station 06434500, Inlet Canal near Belle Fourche, water years 1946-93.

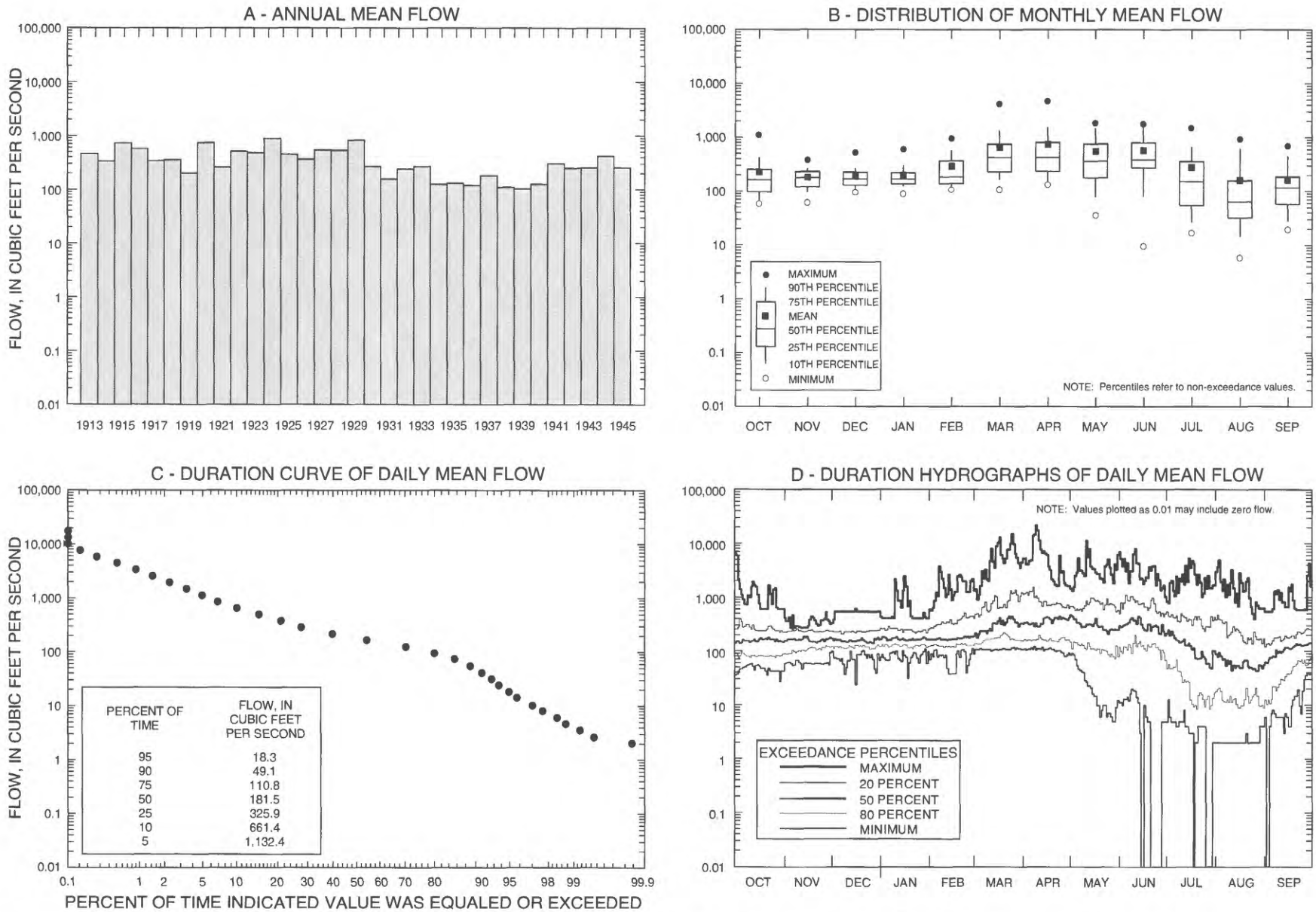


Figure F39. Variations in annual, monthly, and daily mean flow for station 06435500, Belle Fourche River near Belle Fourche, water years 1913-45.

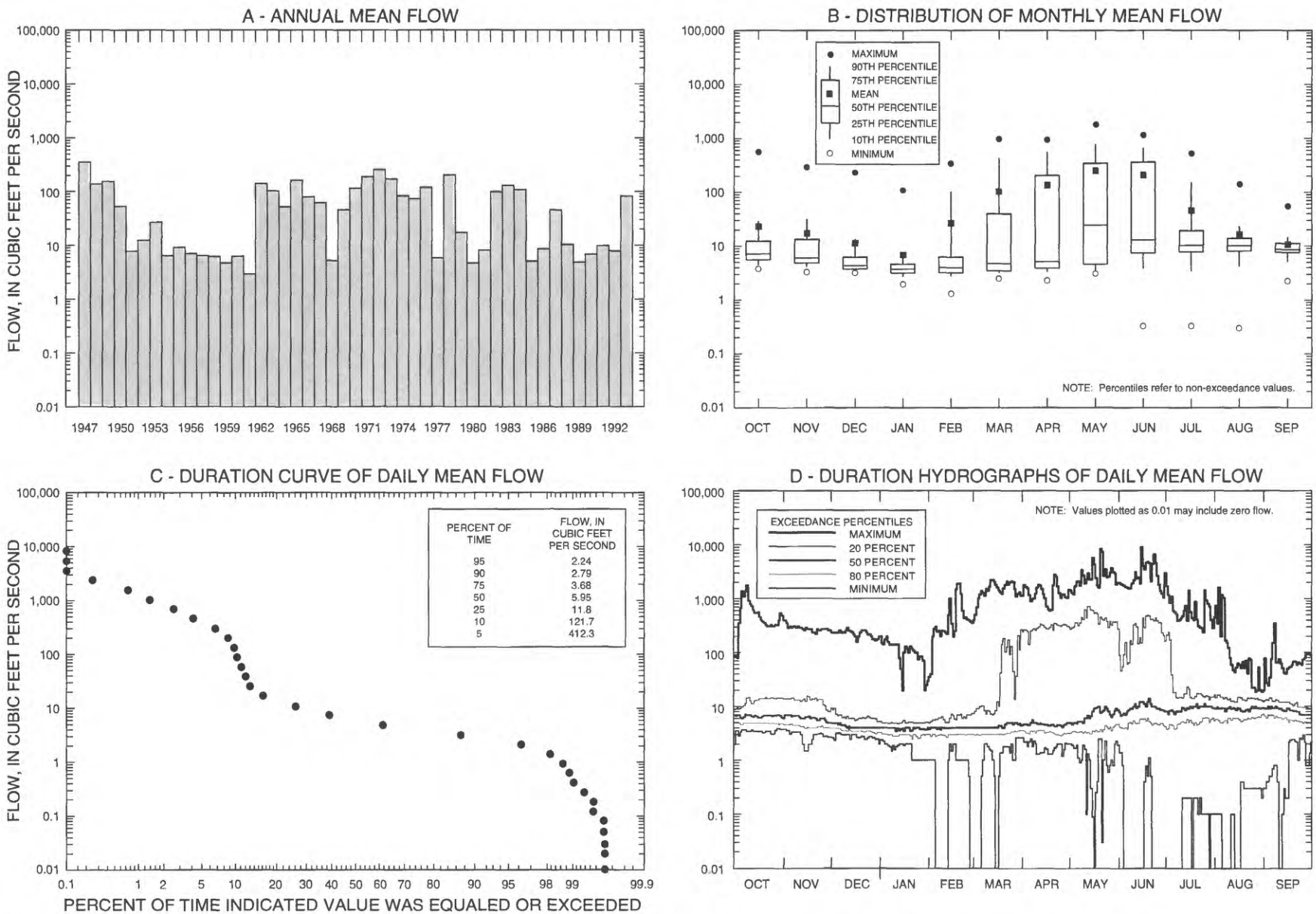


Figure F40. Variations in annual, monthly, and daily mean flow for station 06436000, Belle Fourche River near Fruitdale, water years 1947-93.

z

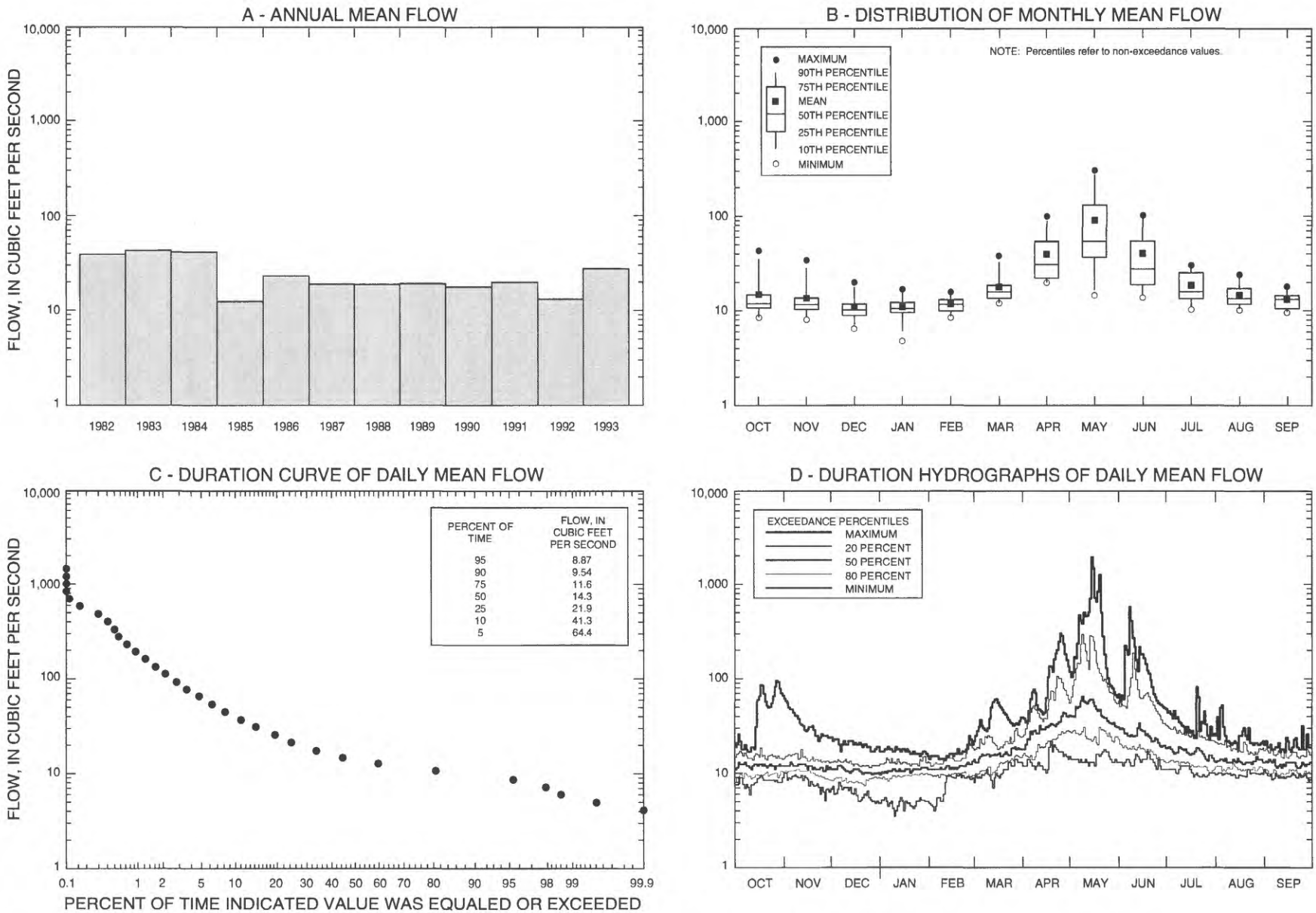


Figure F41. Variations in annual, monthly, and daily mean flow for station 06436170, Whitewood Creek at Deadwood, water years 1982-93.

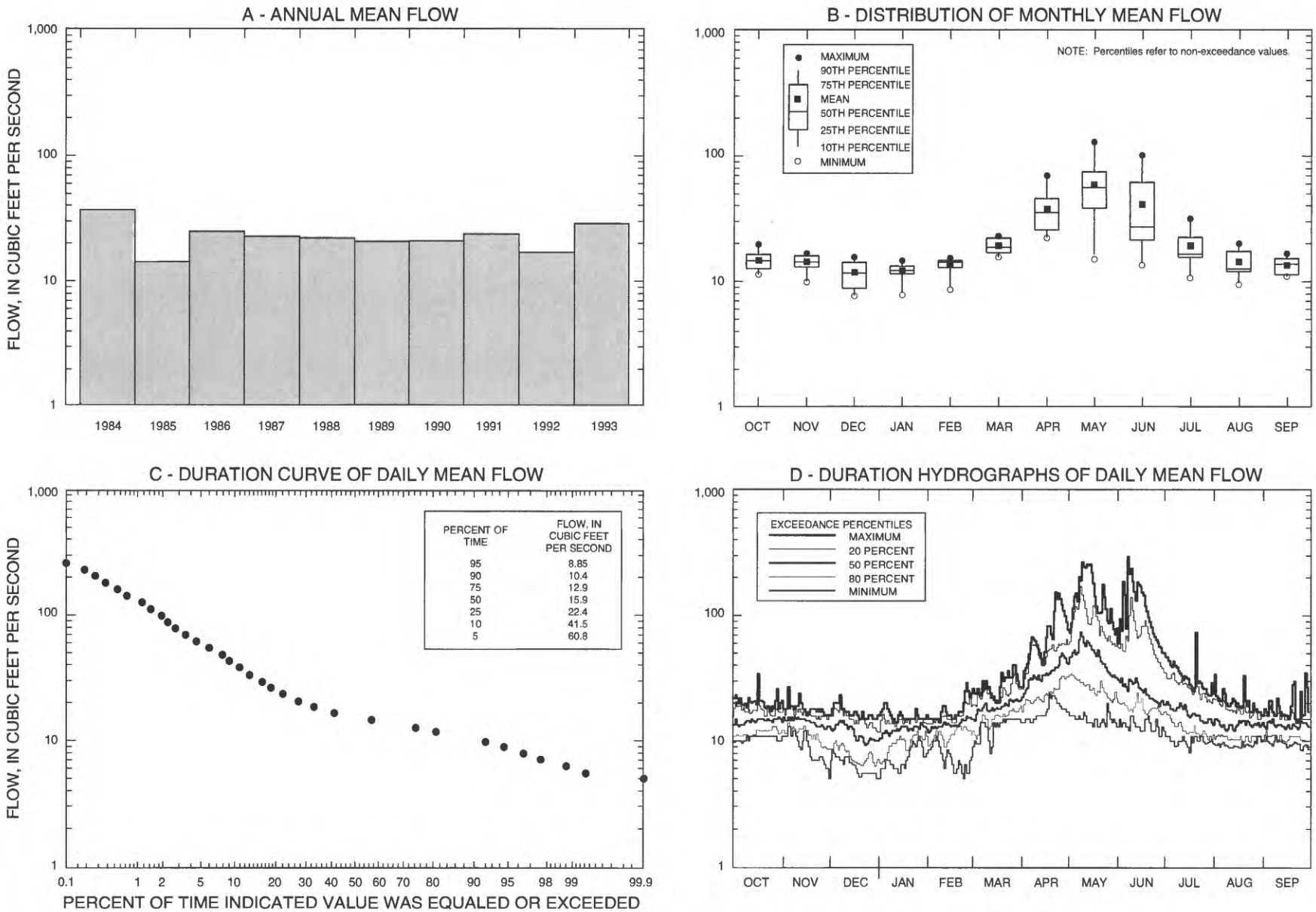


Figure F42. Variations in annual, monthly, and daily mean flow for station 06436180, Whitewood Creek above Whitewood, water years 1984-93.

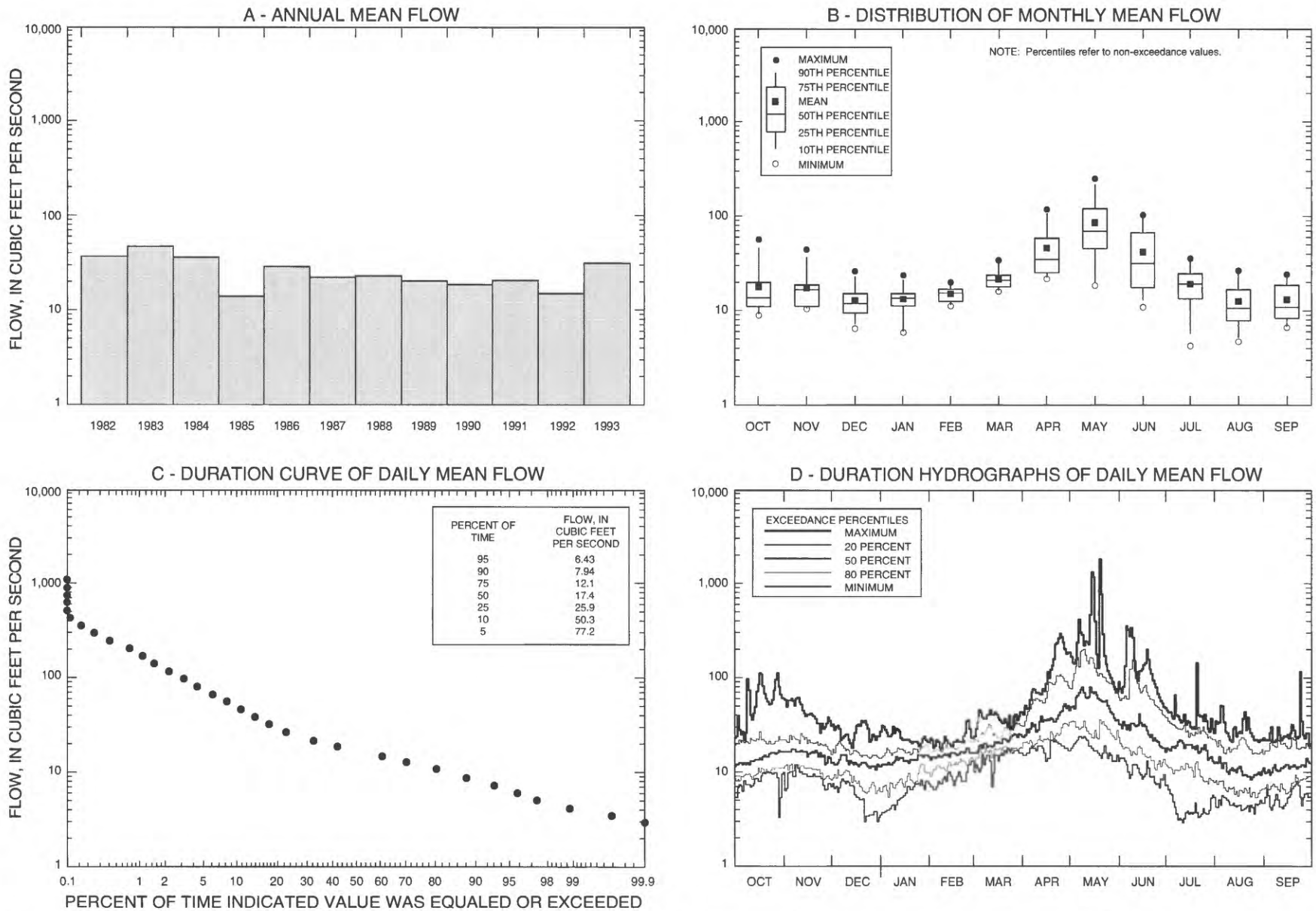


Figure F43. Variations in annual, monthly, and daily mean flow for station 06436190, Whitewood Creek near Whitewood, water years 1982-93.

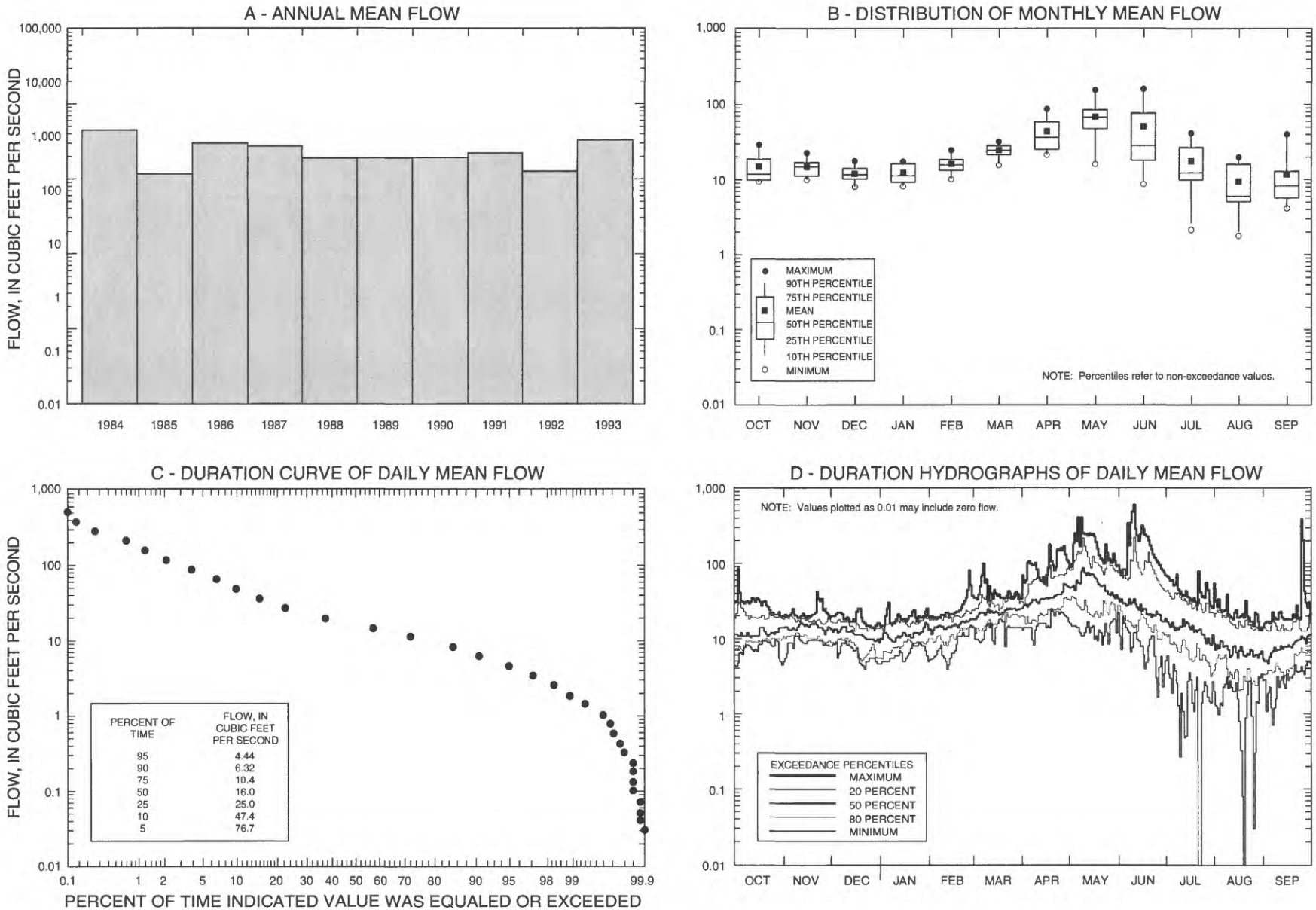


Figure F44. Variations in annual, monthly, and daily mean flow for station 06436198, Whitewood Creek above Vale, water years 1984-93.

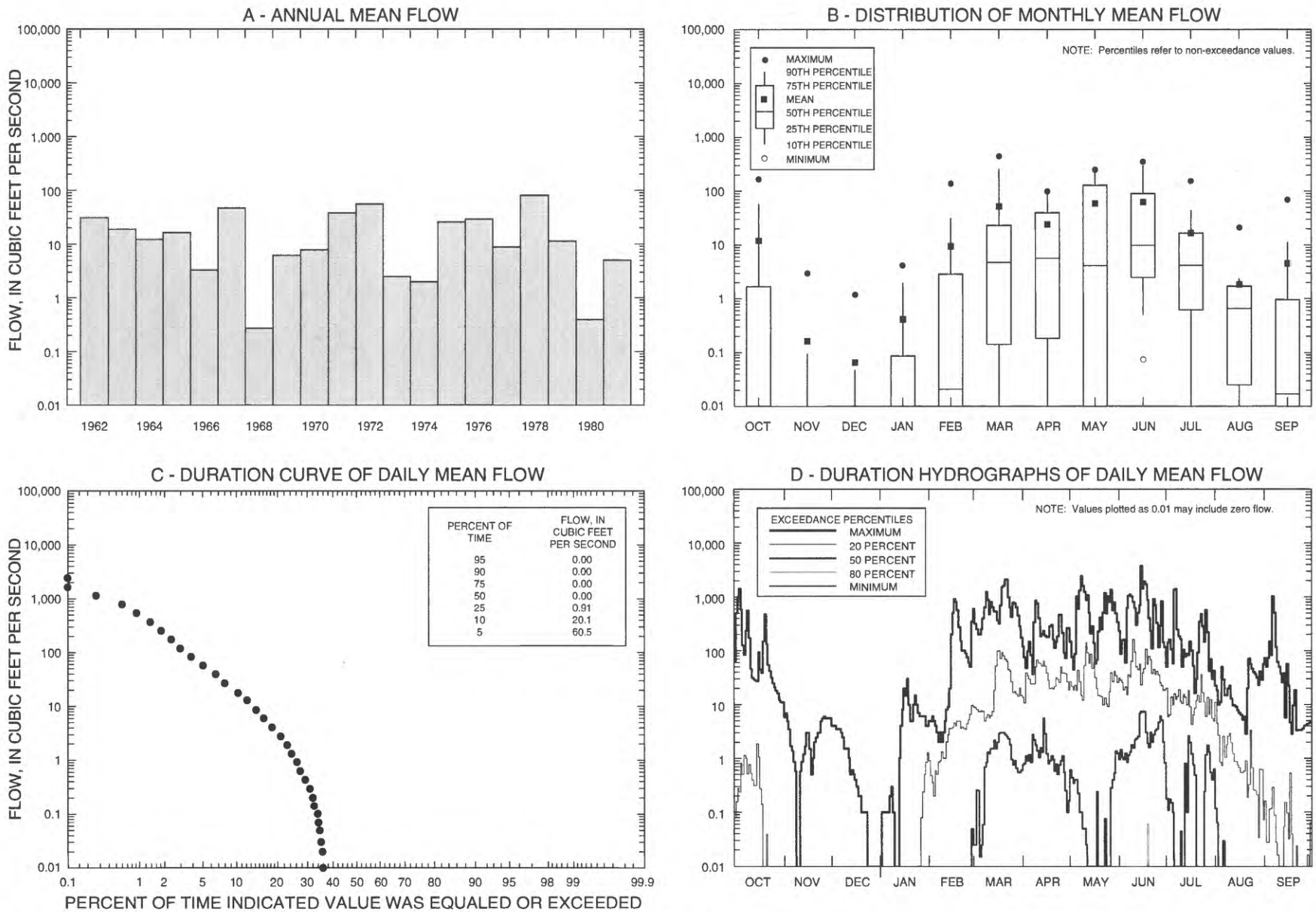


Figure F45. Variations in annual, monthly, and daily mean flow for station 06436700, Indian Creek near Arpan, water years 1962-81.

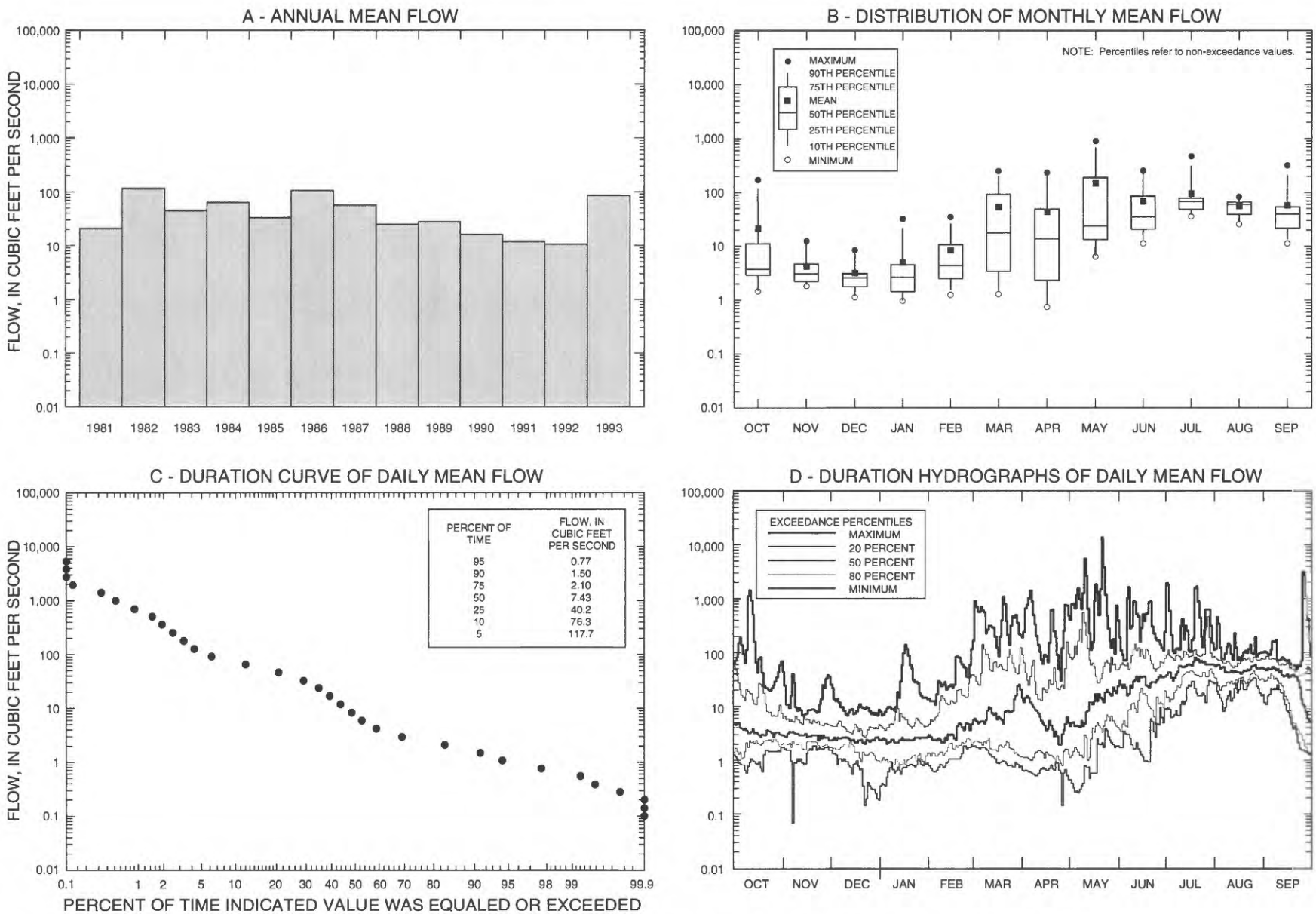


Figure F46. Variations in annual, monthly, and daily mean flow for station 06436760, Horse Creek above Vale, water years 1981-93.

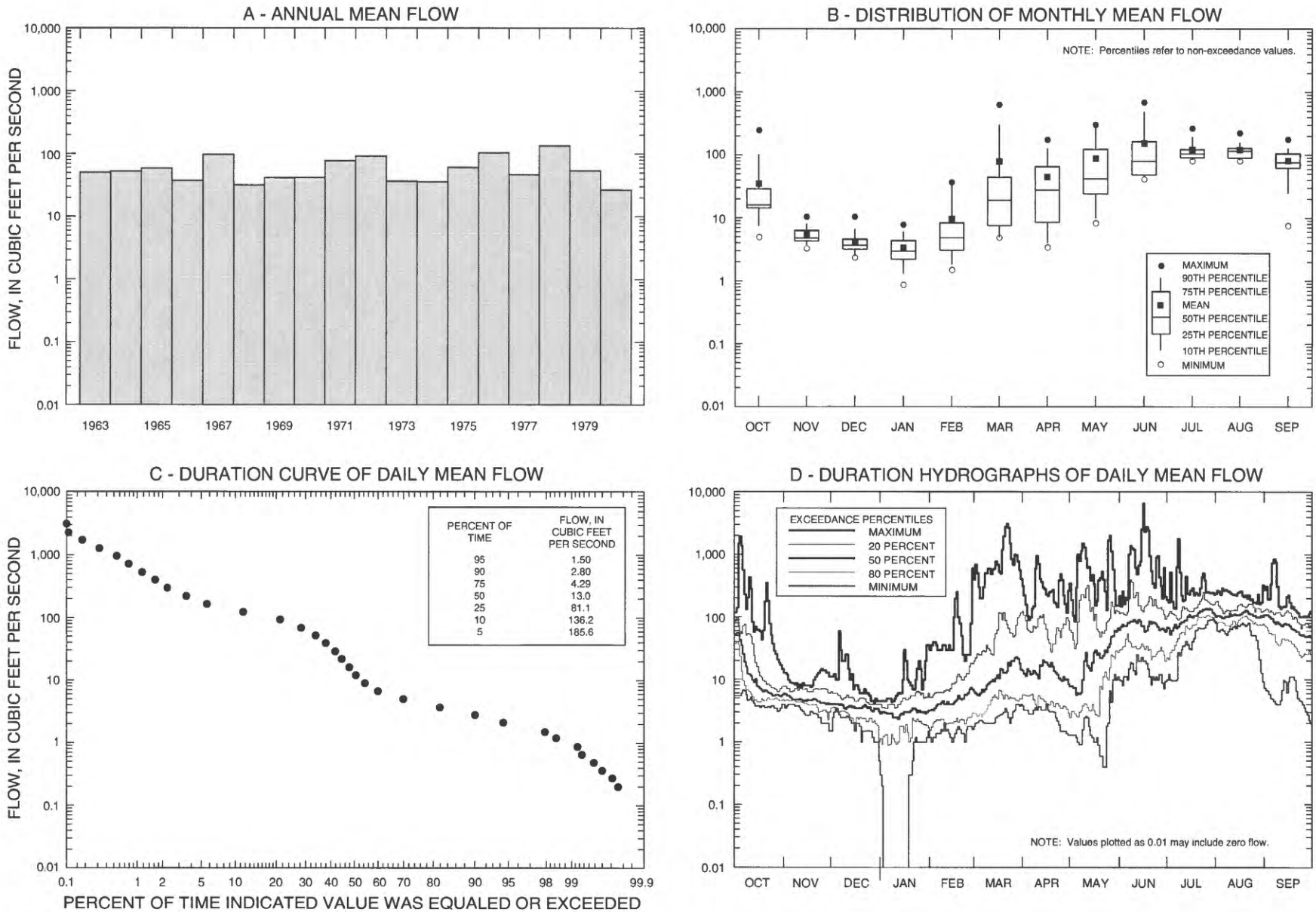


Figure F47. Variations in annual, monthly, and daily mean flow for station 06436800, Horse Creek near Vale, water years 1963-80.

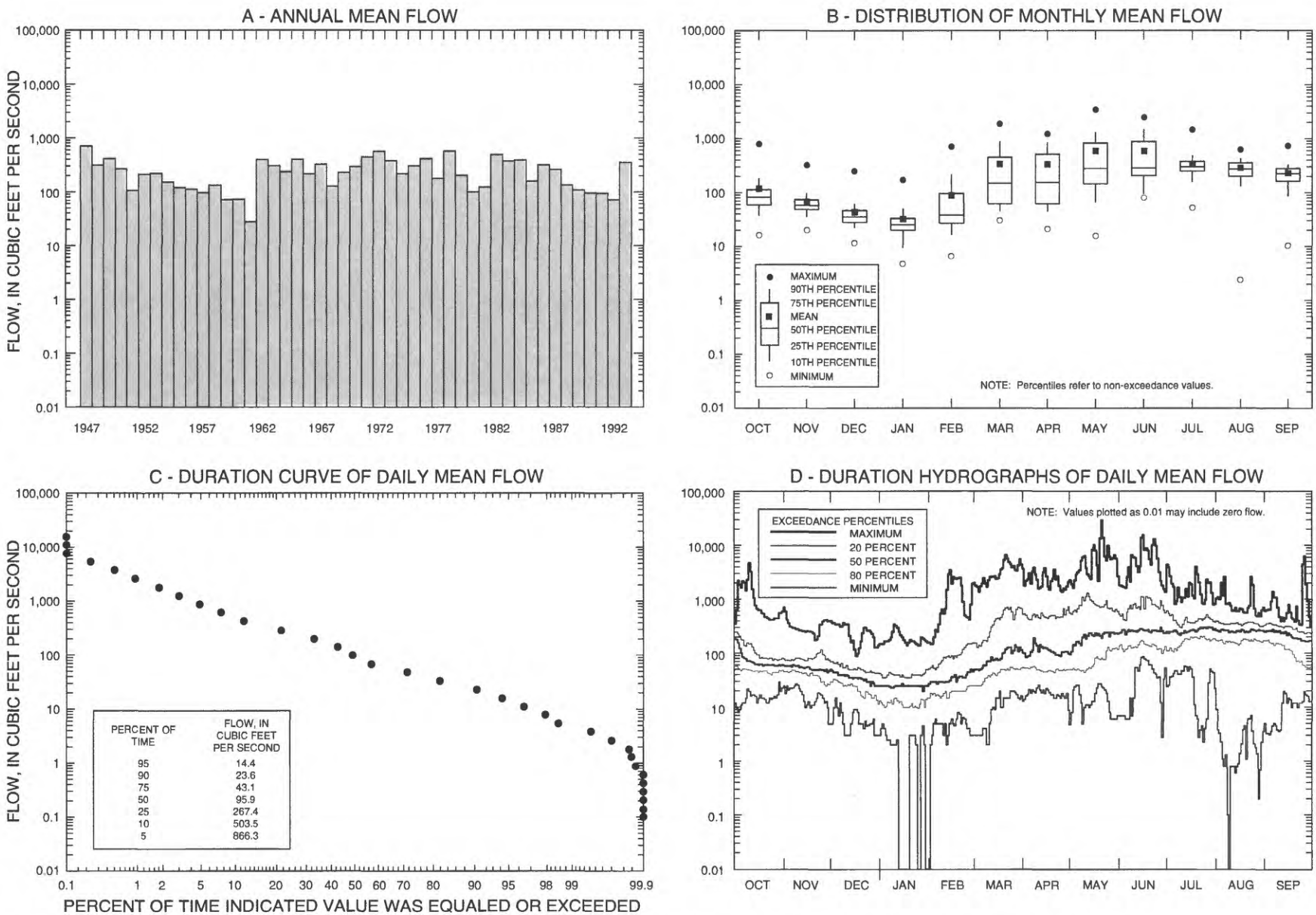


Figure F48. Variations in annual, monthly, and daily mean flow for station 06437000, Belle Fourche River near Sturgis, water years 1947-93.

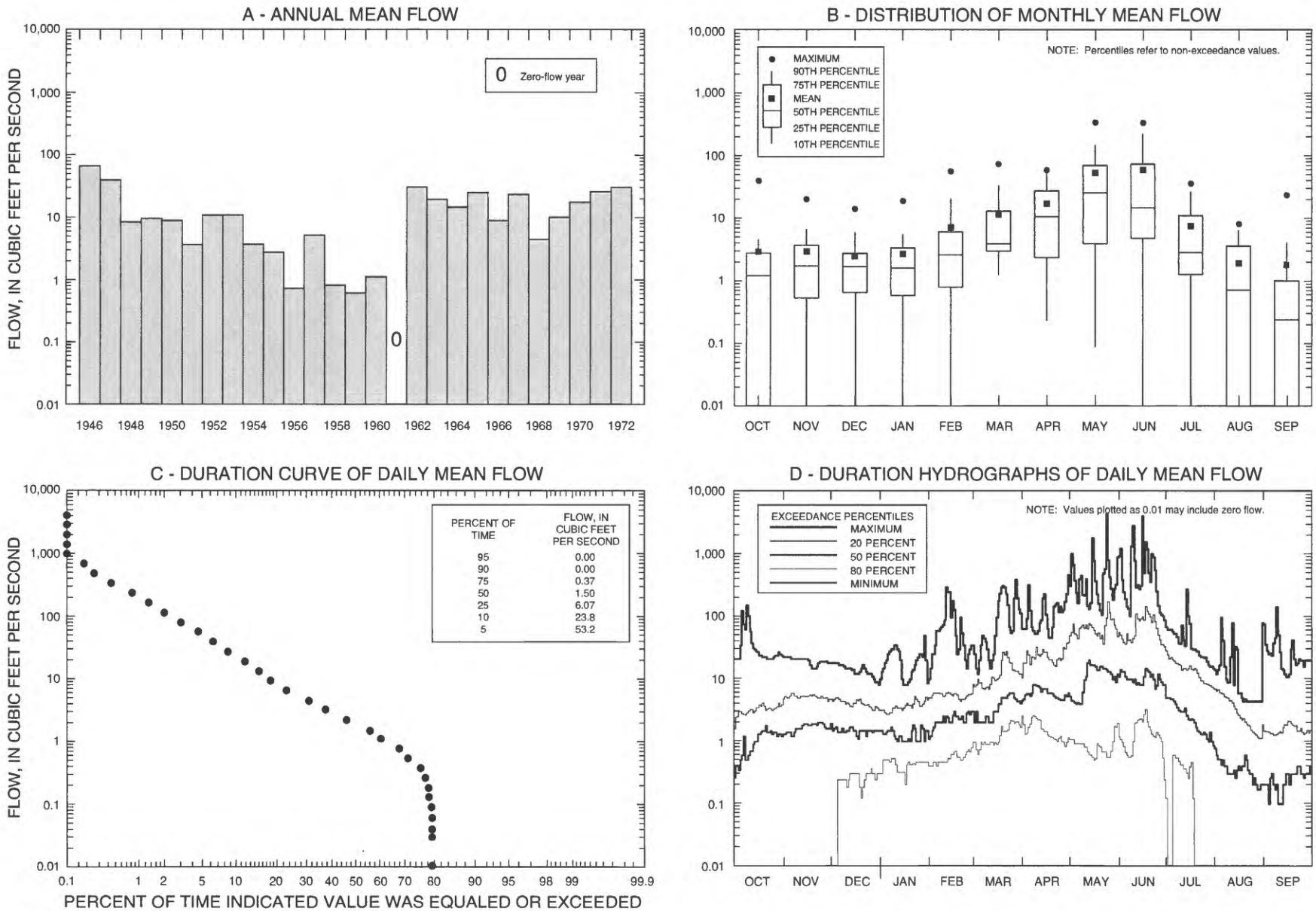


Figure F49. Variations in annual, monthly, and daily mean flow for station 06437500, Bear Butte Creek near Sturgis, water years 1946-72.

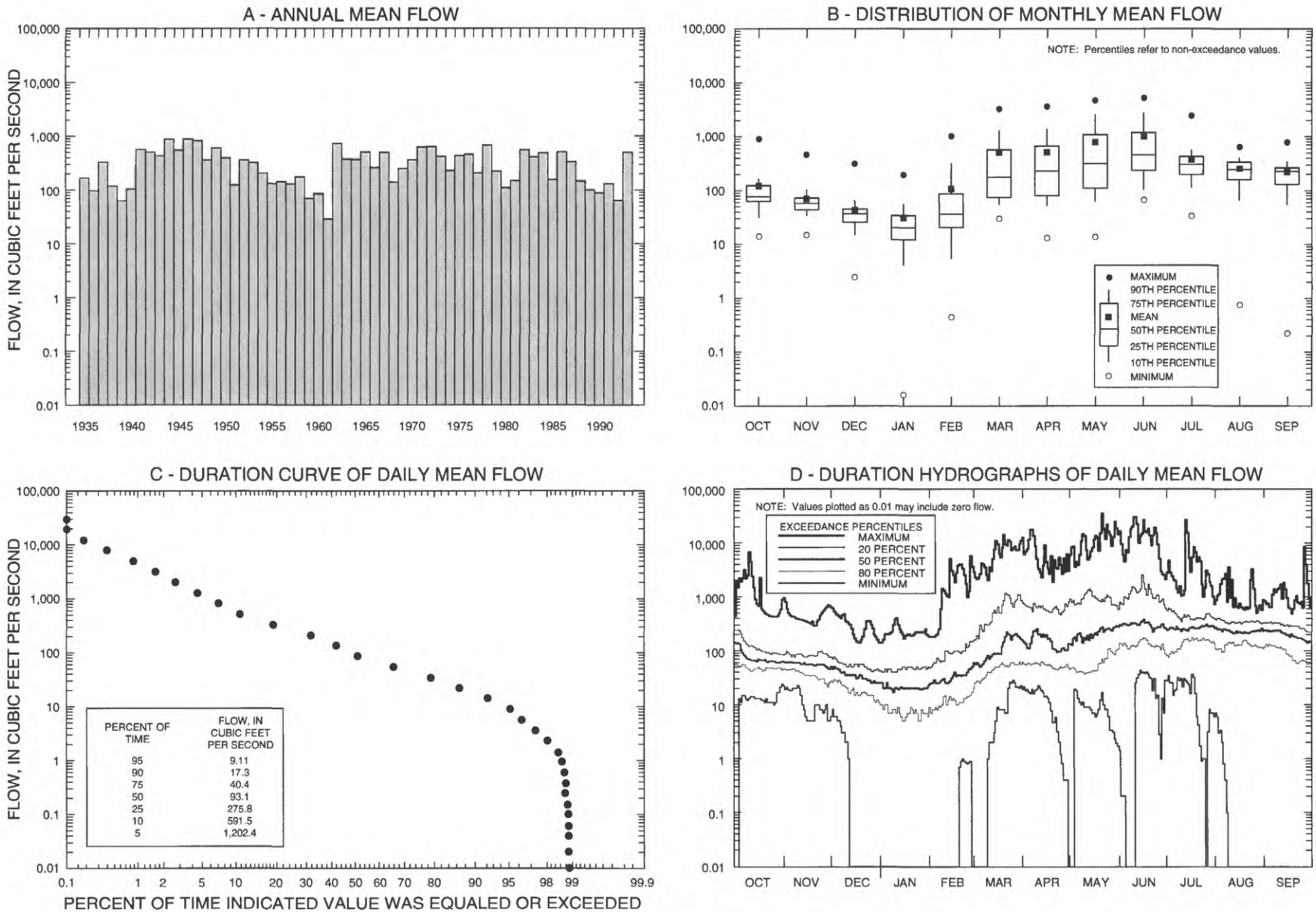


Figure F50. Variations in annual, monthly, and daily mean flow for station 06438000, Belle Fourche River near Elm Springs, water years 1935-93.

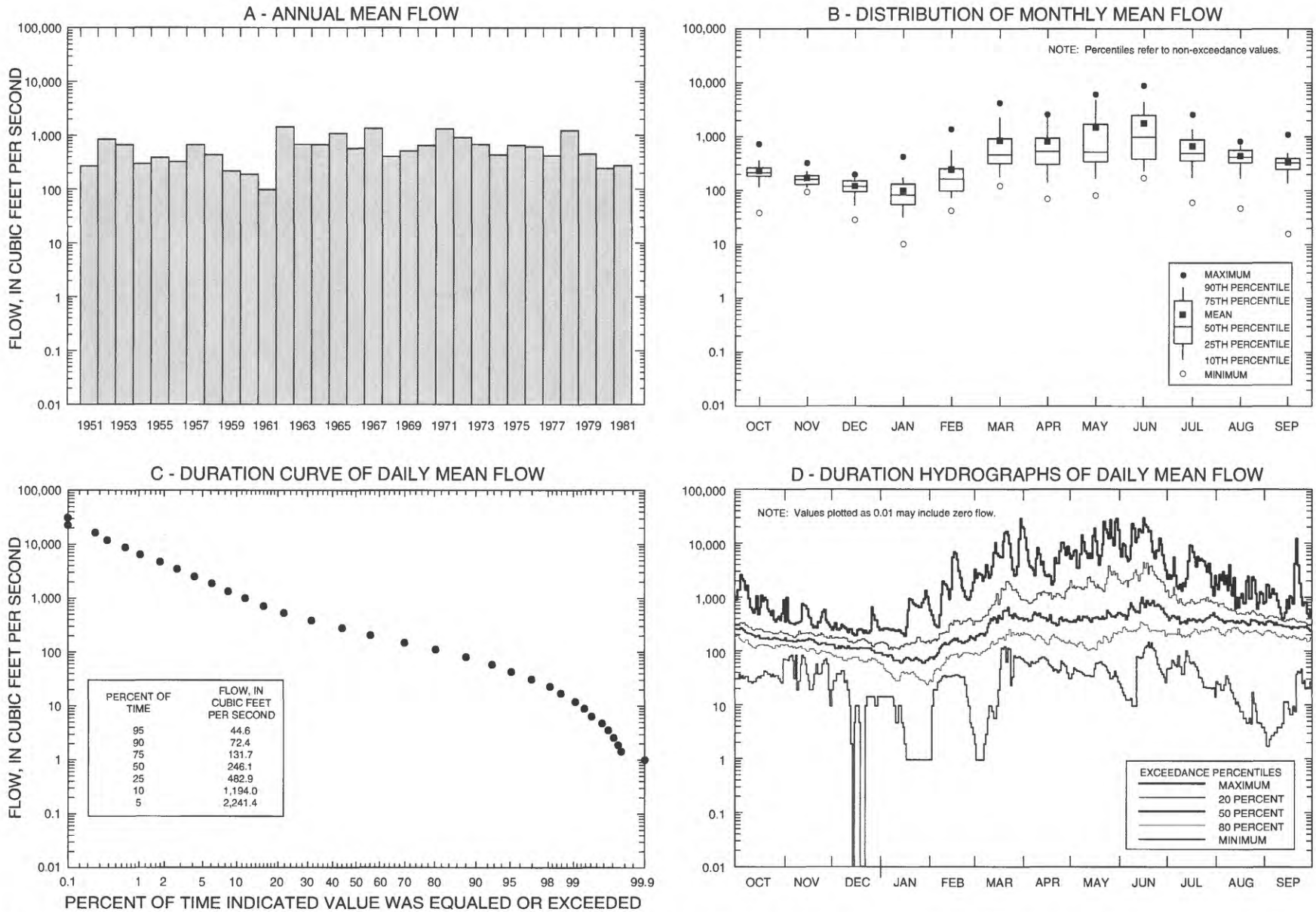


Figure F51. Variations in annual, monthly, and daily mean flow for station 06438500, Cheyenne River near Plainview, water years 1951-81.

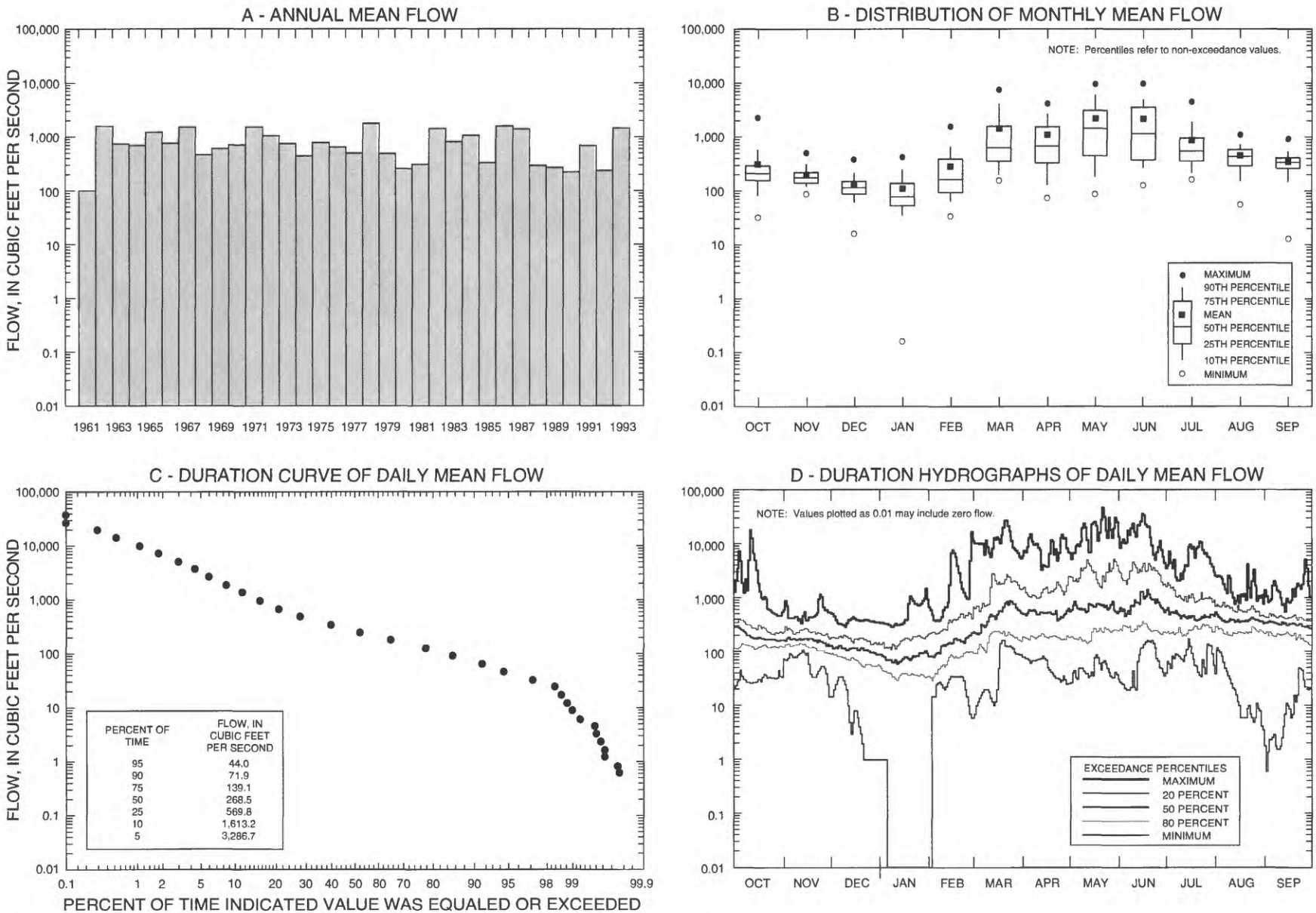


Figure F52. Variations in annual, monthly, and daily mean flow for station 06439300, Cheyenne River at Cherry Creek, water years 1961-93.

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