HISTORY OF IRRIGATION AND CHARACTERISTICS OF STREAMFLOW IN NEBRASKA PART OF THE NORTH AND SOUTH PLATTE RIVER BASINS

U.S. GEOLOGICAL SURVEY

Open-File Report 76-167

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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By F. B. Shaffer

Open-File Report 76-167

Lincoln, Nebraska

June 1976

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ILLUSTRATIONS

CONVERSION FACTORS

Factors to convert English units published herein to metric units, using the International System of Units (SI), are given below:

Multiply English units	By	To obtain metric units
Acres	0.4047	Square hectometres (hm^2)
Acre-feet (acre-ft)	1233	Cubic metres (m^3)
	1.233×10	Cubic hectometres (hm^3)
	1.233×10	Cubic kilometres (km^3)
Cubic feet (ft^3)	0.02832	Cubic metres (m^3)
Cubic feet per second (ft^3/s)	0.02832	Cubic metres per second (m^3/s)
Feet (ft)	0.3048	Metres (m)
Feet per mile (ft/mi)	0.1894	Metres per kilometre (m/km)
Inches (in)	0.0254	Metres (m)
Miles (mi)	1.609	Kilometres (km)
Square miles (mi^2)	2.590	Square kilometres (km^2)

HISTORY OF IRRIGATION AND CHARACTERISTICS OF STREAMFLOW IN NEBRASKA PART OF THE NORTH AND SOUTH PLATTE RIVER BASINS

By F. B. Shaffer

ABSTRACT

More than 80 years of streamflow records have been collected in Nebraska. Such records are essential in planning water developments and managing water resources. Their value can be enhanced if the records are analyzed statistically. This report presents statistics on the flow of streams in the North and South Platte River basins. Major irrigation projects have been constructed in the basins since gaging of streams was begun, and the records of stream discharge at gaging stations show the effects on streamflow of those developments. Streamflow records presented in this report were computed from data that represent 1973 conditions.

All reservoirs on the North Platte River above Lake McConaughy are in Wyoming. The operation of those reservoirs and irrigation projects has a direct effect on the characteristics of streamflow in the Nebraska part of the basin. A brief description of the present river system is presented.

INTRODUCTION

This report presents historical and geographical data pertinent to streamflow and summarizes water-resources data that are representative of current hydrologic conditions. Such records are essential in planning water developments and managing water resources. No published report gives a complete historical record and description of the organization and operation of the principal irrigation projects in the Nebraska part of the basins.

Nebraska's streams have been gaged for more than 80 years under a variety of State, Federal, and State-Federal cooperative programs. The programs, which were sporadic from 1894 to 1931, have been more or less continuous since 1931. As the mass of data accumulated, analysis became more difficult. Before computers were developed, it was very time-consuming to make statistical analyses of stream-discharge records.

Now, however, data can be processed and evaluated speedily once an appropriate computer program is written. Presented in this report are statistical analyses of streamflow data from 22 gaging stations on the North Platte River and its tributaries, from 5 stations on the South Platte River and its tributaries, and from 1 synthetic station on the Platte River below confluence of the North and South Platte Rivers. The description of station 06690000 Lake McConaughy is also included. Locations of the stations and upstream installations affecting the streamflow are shown in figure 1. Analyses are for the entire period of record except when upstream development materially altered the streamflow. Locations of gaging stations and canals are shown in figure 2.

Statistical analyses of data at gaging stations include tables of monthly and annual mean discharges, duration of daily mean discharges, and probability of annual high and low flows.

SOURCES OF DATA

U.S. Geological Survey publications containing records of daily discharges at gaging stations analyzed in this report are as follows:

Water year	Water-Supply Paper	Water year	Water-Supply Paper	Water year	Water-Supply Paper	Water year	Water-Supply Paper
1928	666	1941	926	1954	1340	1966	
1929	686	1942	956	1955	1390	1967	
1930	701	1943	976	1956	1440	1968	2118
1931	716	1944	1006	1957	1510	1969	
1932	731	1945	1036	1958	1560	1970	
1933	746	1946	1056	1959	1630		
1934	761	1947	1086	1960	1710	1971	
1935	786	1948	1116			1972	Annual reports[1/]
1936	806	1949	1146	1961		1973	
1937	826	1950	1176	1962		1974	
1938	856	1951	1210	1963	1918		
1939	876	1952	1240	1964			
1940	896	1953	1280	1965			

[1/] Entitled "Water Resources Data for Nebraska, Part 1." Prepared in cooperation with State and other Federal agencies.

Records of monthly and annual mean discharges through September 1950 at all stream-gaging stations are published in Water-Supply Paper 1310 and those for the period October 1950 to September 1960 are published in Water-Supply Paper 1730.

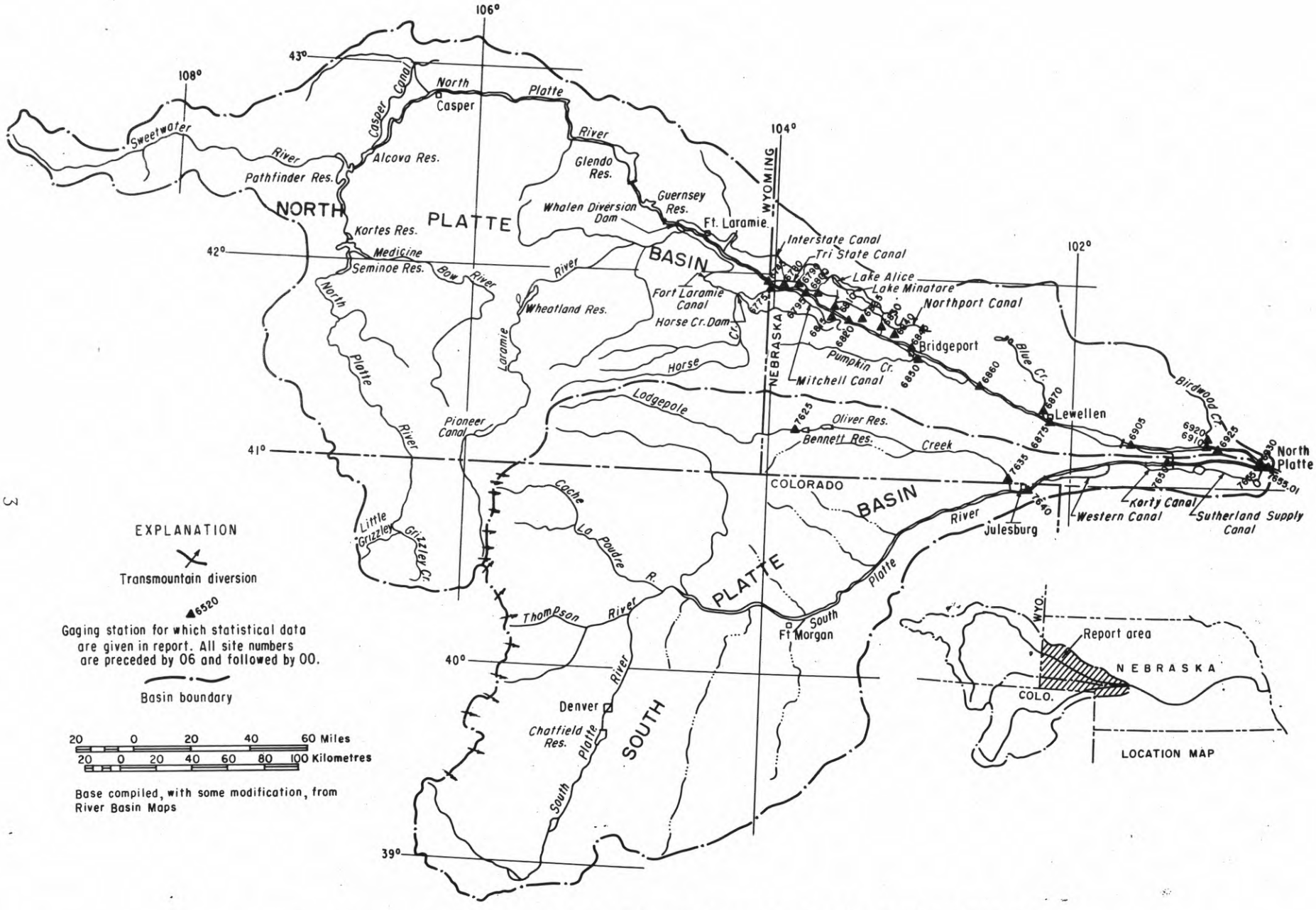

Figure 1.--North and South Platte River drainage basins showing locations of stream-gaging stations and installations that affect streamflow in Nebraska.

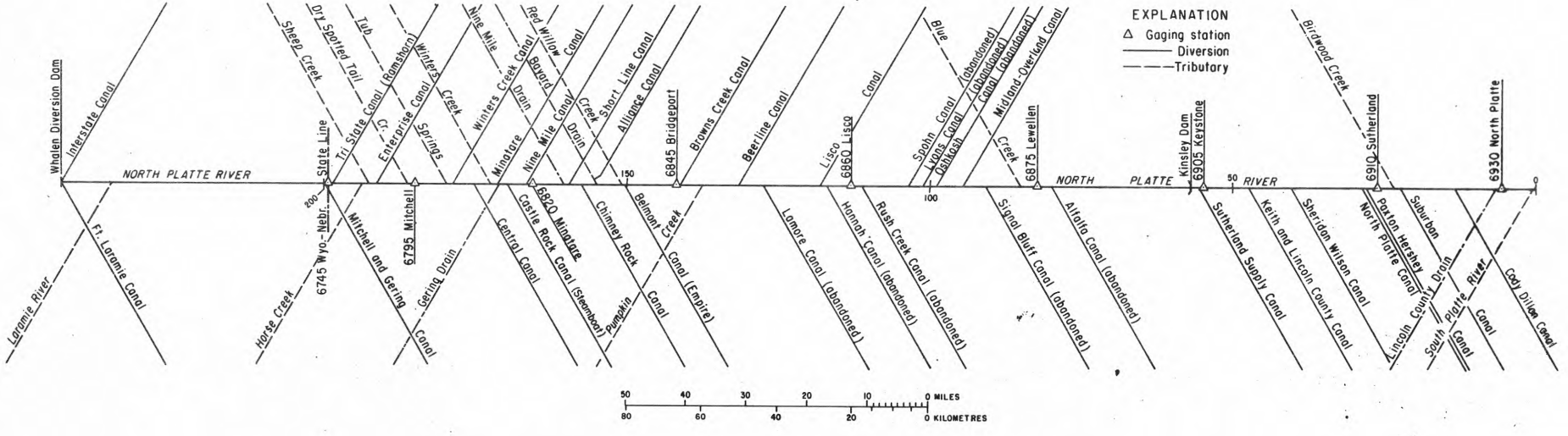

Figure 2.--Gaging stations on the North Platte River and locations of tributaries to and diversions from the North Platte River.

Sources of other information used in preparing this report are:

Water rights and diversions--Hydrographic and Biennial Reports of Nebraska Department of Water Resources

Irrigation well registrations--Files of Nebraska Department of Water Resources

Irrigation well locations--Files of Conservation and Survey Division of University of Nebraska

Acreage reports--Files of Nebraska Department of Water Resources

Climatological Data--Climatological Summaries and Annual Reports of U.S. Weather Bureau and National Oceanic and Atmospheric Administration

DEFINITION OF TERMS

Terms used in this report are defined as follows:

Acre-foot (acre-ft) is amount of water necessary to cover 1 acre to a depth of 1 ft and is equivalent to 43,560 ft^3 (1,234 m^3).

Acre-feet delivered to farms is total water diverted less main canal and lateral losses.

Climatic year is a continuous 12-month period beginning April 1, ending March 31. It is used in low-flow probability analyses and is designated by the calendar year in which it ends. (See water year.)

Cubic foot per second (ft^3/s) is the unit of measurement used in determining stream discharge, sometimes referred to as second-foot (sec-ft). It is a volume of 1 cubic foot (ft^3) passing a given point during 1 second of time and is equivalent to 7.48 gallons per second (gal/s) or 448.8 gallons per minute (gal/min) or 0.02832 cubic metres per second (m^3/s).

Duration table shows the percentage of time that specified discharges are equaled or exceeded.

Evapotranspiration is the vaporization of water from a land area. It includes evaporation from moist surfaces plus that transpired by vegetation.

Exceedence probability is the percent chance that the discharge will exceed that indicated in a given unit of time. (See recurrence interval.)

Net diversion is the arithmetic difference between the measured quantity of water diverted from a stream into the upper end of a canal and the quantity of unused water returned to that stream.

Nonexceedence probability is the percent chance that the discharge will be less than that indicated in any climatic year. (See recurrence interval.) The mean 7-day low flow having a 10-percent nonexceedence probability (10-year recurrence interval) is used in applying Nebraska water-quality criteria to water pollution studies (Nebr. Dept. of Health, 1969, p. 18).

Recurrence interval (return period) is the average interval of time that a high-flow event will be equaled or exceeded only once, or that a low-flow event will be equaled or not exceeded only once. It is equal to the reciprocal of the exceedence or nonexceedence probability multiplied by 100.

Total diversion is the measured quantity of water diverted from a stream into the upper end of a canal.

Water year is the 12-month period beginning October 1 and ending September 30. It is used in analyzing surface-water supply and is designated by the calendar year in which it ends. (Also see climatic year.)

LIMITATIONS ON USE OF STATISTICAL DATA ON STREAMFLOW

The reliability of the statistics tabulated in this report depend on the length of record and the changes in use of water, diversions, and storage. The statistics are valid as long as water use remains the same as during the period on which the statistics are based.

NORTH PLATTE RIVER DRAINAGE SYSTEM

The North Platte River drains an area of about 34,900 mi^2 (90,400 km^2), 27,700 mi^2 (71,700 km^2) in Colorado and Wyoming and 7,200 mi^2 (18,600 km^2) in Nebraska.

The headwaters of the river are in north-central Colorado, about 90 mi (144 km) northwest of Denver, and the principal source of streamflow is snowmelt. Altitudes range from about 11,500 ft (3,500 m) in the uppermost reaches to 2,800 ft (853 m) at the lower end where it joins the South Platte River near North Platte, Nebr.

Grizzley and Little Grizzley Creeks join in Colorado to form the North Platte River, which flows generally toward central Wyoming, then veers to the northeast, then east, and finally southeast into Nebraska.

River distance from the river's source to the Colorado-Wyoming State line is about 30 mi (48 km); from the Colorado-Wyoming State line to the Wyoming-Nebraska State line, about 435 mi (700 km); and from the Wyoming-Nebraska State line to the junction of the North Platte with the South Platte, about 200 mi (322 m). The gradient of the Nebraska reach is 6.15 ft/mi (1.16 m/km).

History of irrigation

Small ditches to divert stream water to crops in Wyoming were constructed in the North Platte River basin as early as 1850. By 1870, several privately owned projects had been developed. The Pioneer Canal that diverted water from the Laramie River was dug in 1879, and in 1883 the Wheatland and Riverside projects were built in the Laramie River basin. Irrigation expanded rapidly through the 1880's. Today (1975) about 176,000 acres (71,200 hm^2) are irrigated in the Laramie River basin. The upstream use of water has reduced the flow of the North Platte River where it enters Nebraska.

The first known irrigation project built in Nebraska was a small ditch near North Platte, constructed in 1859 to divert water from the South Platte River. The next known project was the 4-mi (6.4-km) canal along the south side of the Platte River about 15 mi (24 km) east of North Platte. This project, which served only about 4 acres (1.6 hm^2), was built and operated in the 1870's by John Burke to irrigate vegetable crops that he sold to soldiers at nearby Ft. McPherson. Construction of larger privately financed irrigation projects in Nebraska began in the 1880's and continued until about 1904 (fig. 3), when gravity-type irrigation in the North Platte River basin approached full development. Virtually all land accessible for irrigation was being served in 1904, and low flows in summer already were overappropriated.

Prior to 1893, a right to divert water from any stream in Nebraska for irrigation was acquired simply by posting a notice on the bank of a stream at the proposed point of diversion and filing a copy of the notice with the county clerk of the county where the diversion was to be made. Priority of such a right carried the date of posting and was identified by docket number.

Under the Comprehensive State Code Act of April 1895, water in streams of the State not previously appropriated for beneficial use was declared to be publicly owned. Right to the water was acquired by making application to the State Board of Irrigation (now Department of Water Resources). A right was granted if waters of the stream were not being used beneficially. These rights are identified by an appropriation or water-right number and are listed in biennial reports of the Nebraska Department of Water Resources.

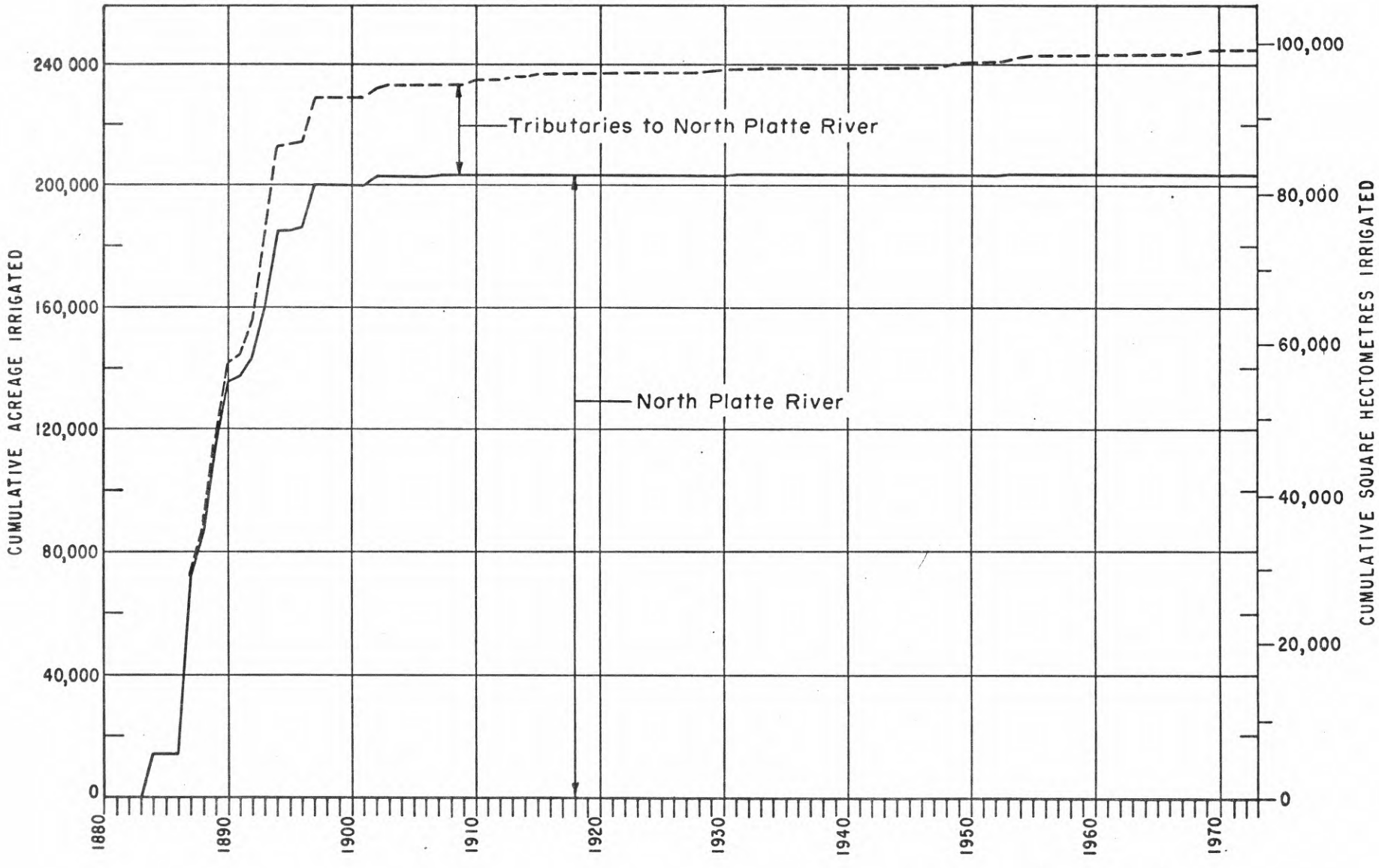

Figure 3.--Cumulative acreage irrigated with water from the North Platte River and its tributaries in Nebraska.

The North Platte project, built under direction of the U.S. Bureau of Reclamation, was the first major publicly financed irrigation project constructed on the River. It was authorized March 14, 1903, under the Reclamation Act of 1902, and its priority date is April 14, 1904. Pathfinder Dam in south-central Wyoming, the principal feature of the North Platte project, was completed in April 1909. Its purpose was to store floodwaters and release them to three major irrigation projects, namely, the Interstate, the Fort Laramie, and the Northport projects, which include lands in Nebraska. Storage capacity of the Pathfinder Reservoir is 1,016,000 acre-ft (1,253 hm^3). Releases for the Interstate and Fort Laramie Canals are diverted from the river at Whalen Dam in Wyoming, about 190 mi (306 km) downstream from the reservoir, and for the Northport Canal at Tri-State Dam, 1 mi (1.6 km) downstream from the Wyoming-Nebraska State line.

In addition to supplying water for the North Platte project, Pathfinder Reservoir stores water for diversion into several other canals in Wyoming and Nebraska. On June 21, 1911, under an agreement known as the Warren Act, the U.S. Bureau of Reclamation entered into contracts to supply water to three canals in Wyoming and six canals in Nebraska for periods when natural flow was inadequate to meet irrigation requirements.

Guernsey Reservoir in Wyoming, situated about 180 mi (290 km) downstream from Pathfinder, was completed in July 1927. Its initial capacity was 70,000 acre-ft (86 hm^3), and its purpose was to store peak flows originating below Pathfinder Dam to provide head for the generation of hydroelectric power and to regulate streamflow. Sediment deposition gradually reduced the capacity of Guernsey Reservoir to its present volume of 45,228 acre-ft (55.8 hm^3).

After completing the North Platte project, the Bureau of Reclamation built Kendrick and Glendo projects, both in Wyoming. Principal features of the Kendrick project are the Alcova Reservoir, capacity 190,700 acre-ft (235 hm^3), and Seminoe Reservoir, capacity 1,011,000 acre-ft (1,247 hm^3). Completion dates were 1938 and 1939, respectively. In addition to providing additional storage space for spring runoff, the Kendrick project also supplies water to the Casper Irrigation District, which serves 35,000 acres (14,000 hm^2) north of Casper, Wyo. Features of the Glendo project are the Glendo Reservoir, completed in 1957, the Fremont Canyon Powerplant, and the Gray Reefs Regulating Reservoir, completed in 1961. Glendo Reservoir, located about 17 mi (27 km) above Guernsey Dam and 58 mi (93 km) upstream from the Wyoming-Nebraska State line, has a capacity of 786,000 acre-ft (969 hm^3). (See fig. 4.) It provides storage for flood control, generation of hydroelectric power, and irrigation.

Spills, drains, and ground-water seepage downstream from Tri-State Dam near the Nebraska-Wyoming line contribute about 600,000 acre-ft (740 hm^3) annually to the flow of the North Platte River before it reaches

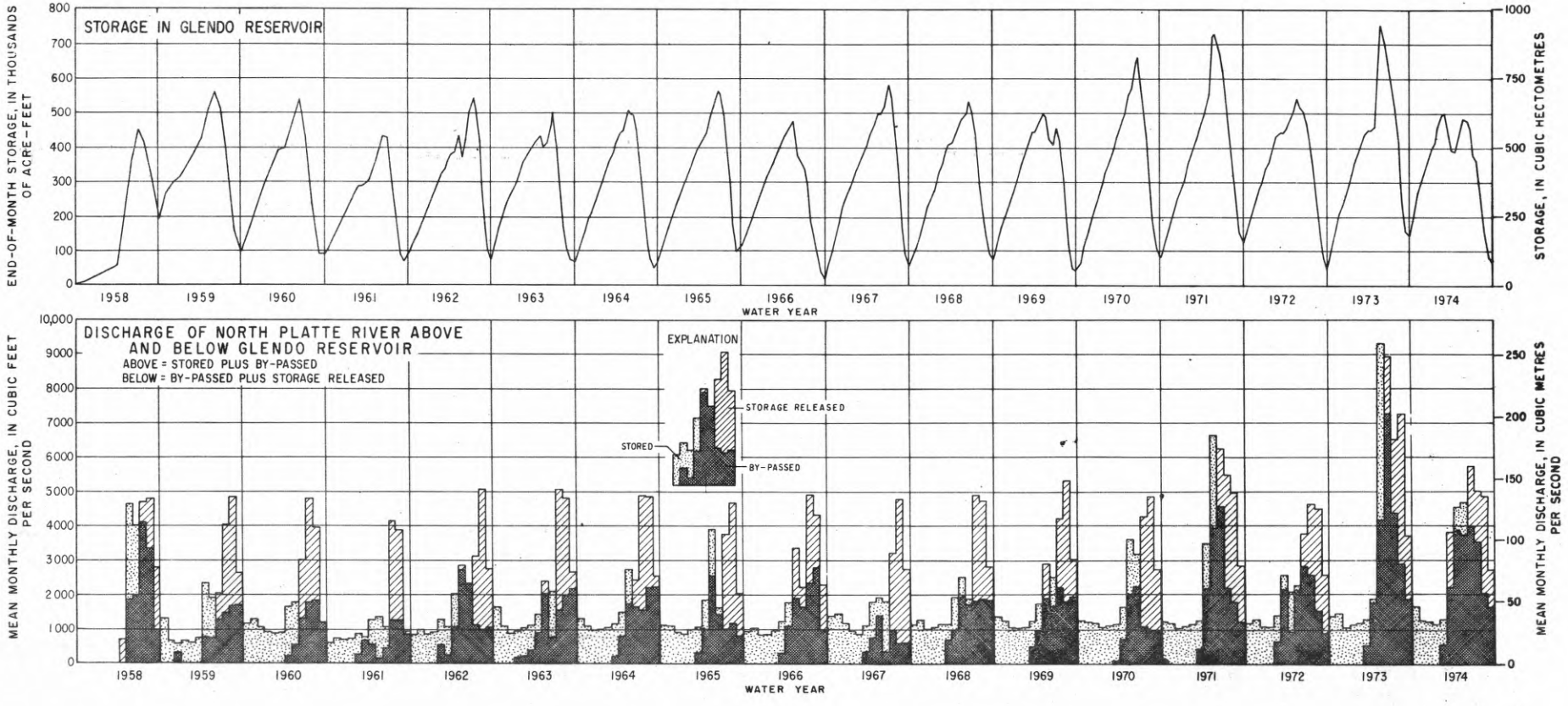

Figure 4.--Storage in Glendo Reservoir and discharge of North Platte River above and below reservoir during water years 1958-74.

the upper end of Lake McConaughy. Much of this return flow is from water diverted at Whalen Dam. Supplemented by runoff from precipitation, streamflow in this reach ordinarily is adequate to supply all irrigation canals that divert water from the North Platte River in Nebraska above McConaughy.

That the flow of the North Platte River at Lewellen constitutes almost the entire inflow to McConaughy Reservoir is shown in figure 5. Streamflow records at Lewellen, about 7 mi (11 km) above the upper end of Lake McConaughy, are considered to represent inflows to the reservoir. Outflows are the sum of North Platte River at Keystone and the Sutherland Supply Canal. Sutherland Diversion Dam is 2 mi (3 km) below Kingsley Dam, and the North Platte River at Keystone is 1/4 mi (0.4 km) below the diversion. During the period 1958-73, subsequent to completion of Glendo Reservoir, net gain in streamflow between the Wyoming-Nebraska State line and Lewellen averaged 477,000 acre-ft (588 hm^3) and flow at Lewellen averaged 1,036,000 acre-ft (1,277 hm^3).

Approximately 198,600 acres (80,100 hm^2) are irrigated with water diverted from the North Platte River between the Wyoming-Nebraska State line and Kingsley Dam. This includes the Mitchell-Gering Diversion a short distance above the State line. If headgate diversions are assumed to be the same as the average for 1974 which was 3.0 acre-ft/acre (0.91 m/hm^2), diversions for irrigation of this acreage in 1974 totaled about 595,800 acre-ft (735 hm^3). Some of the diversions consisted of return flow and spills from water diverted at upstream points in the same reach.

The following table shows the Nebraska acreage irrigated by the canal system extending from Whalen Dam in Wyoming to North Platte, Nebr.

Whalen Dam to Wyoming-Nebraska State line:		
Interstate Canal	100,940	
Fort Laramie Canal	54,090	
Mitchell Canal	13,560	
Gering Canal	13,510	
Subtotal--acres irrigated with water diverted from North Platte River in Wyoming for irrigation in Nebraska		182,100
Wyoming-Nebraska State line to Mitchell	86,960	
Mitchell to Minatare	23,740	
Minatare to Bridgeport	37,040	
Bridgeport to Lisco	14,490	
Lisco to Kingsley Dam	9,300	
Subtotal--acres irrigated with water diverted from North Platte River, State line to Kingsley Dam		171,530
Kingsley Dam to North Platte		43,670
Total--acres irrigated with water diverted from North Platte River		397,300

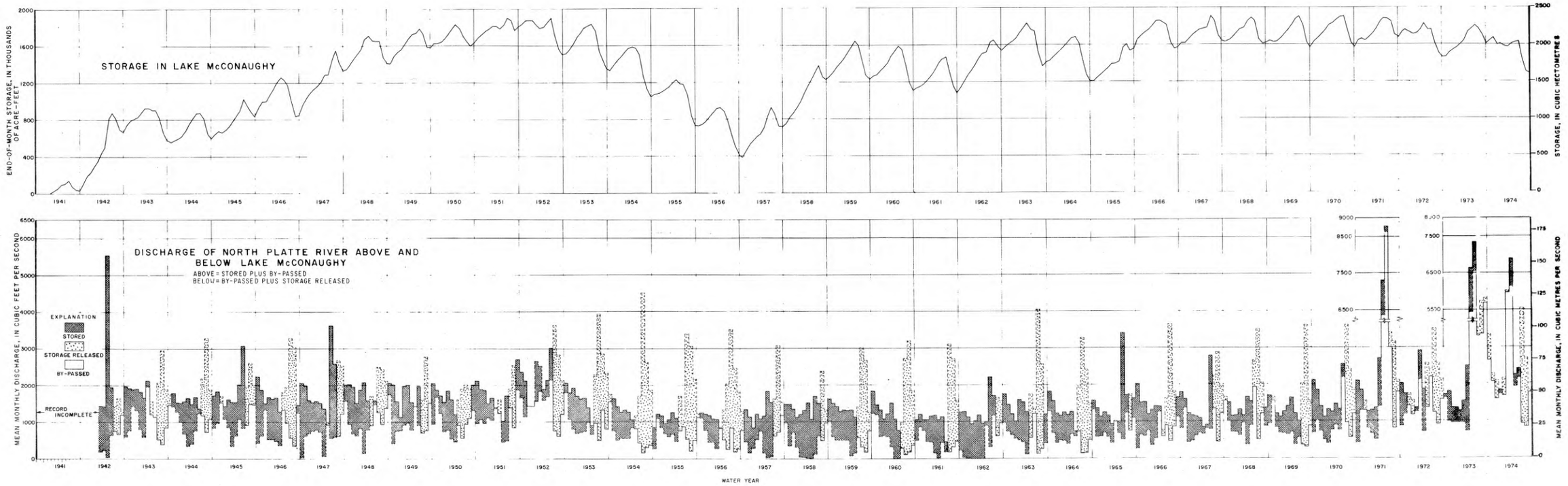

Figure 5.--Storage in Lake McConaughy and discharge of North Platte River above and below reservoir during water years 1942-74.

Irrigation with ground water has extended to all parts of the North Platte River basin with the greatest concentration of wells in Scotts Bluff, Morrill, Keith, and Lincoln Counties (fig. 6). Irrigation from wells progressed rather uniformly from 1934 until 1953; then, a pronounced increase in the number of well installations occurred. Seventy-four percent of the wells in the basin were installed during the period 1953-74 (fig. 7). Some of these wells are used to provide supplemental water to lands also irrigated from streams. Approximately 134,000 acres (54,000 hm^2) in the basin are served wholly or in part by ground water.

Floods

Severe flooding has not occurred on the North Platte River since recordkeeping began. Widespread heavy rainfall seldom occurs on the upper reaches of the river basin. Peak discharges, normally in mid-June, are the result of snowmelt in the mountains. The maximum discharge of record--29,600 ft^3/s (838 m^3/s) at North Platte on June 11, 1909--occurred prior to the building of upstream reservoirs. At the Wyoming-Nebraska State line, the highest recorded discharge since 1909 was 11,500 ft^3/s (326 m^3/s) on June 27, 1955.

The combined usable capacity of the Wyoming reservoirs in the North Platte River basin is about 3.4 million acre-ft (4.2 km^3), and the usable capacity of Lake McConaughy on the North Platte in Nebraska is about 1.95 million acre-ft (2.40 km^3), (fig. 8). Although only the Glendo Reservoir contains specifically reserved space for flood control (273,000 acre-ft or 337 hm^3), all the reservoirs normally have some reserve capacity for storage of floodflows. In 1971 and in 1973, however, a combination of hydrologic events did result in minor flooding along the North Platte. In 1971, because of large holdovers in the reservoirs and extra large volumes of inflow due to rapid snowmelt, the excess water was passed through the reservoirs. Making conditions worse, heavy rains fell on the Nebraska part of the drainage basin. Peak discharges recorded during early June of that year were as follows: 9,860 ft^3/s (279 m^3/s) at the Wyoming-Nebraska State line on June 6 (highest since June 27, 1955) and 13,500 ft^3/s (382 m^3/s) at Lewellen, Nebr., on June 4 (highest since record began in 1940). In 1973, peak discharges occurred in late May and were somewhat less: 8,700 ft^3 (246 m^3/s) at the State line on May 26 and 9,770 ft^3 (277 m^3/s) at Lewellen on May 27.

Because of extensive water-resources developments in the basin, streamflow has been smaller in recent years. As a result, the carrying capacity of some reaches of the North Platte River has been greatly reduced by encroachment of vegetation into the river channel. Developments that restrict the channel increase the flood hazard because overflow now occurs at lower discharges than formerly. Also, to add to the problem, some residential and commercial buildings have been constructed on the flood plain.

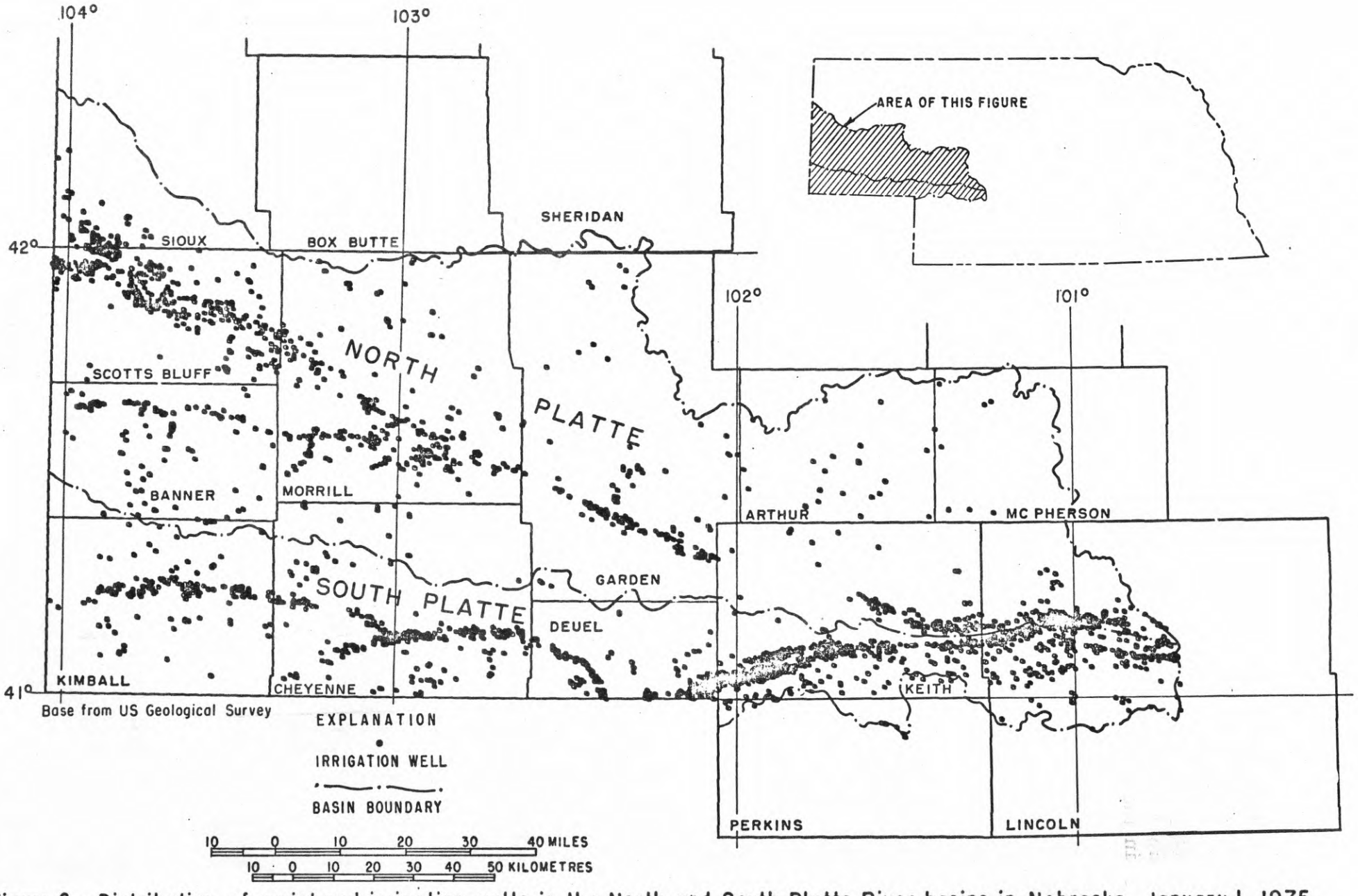

Figure 6.--Distribution of registered irrigation wells in the North and South Platte River basins in Nebraska, January 1, 1975.

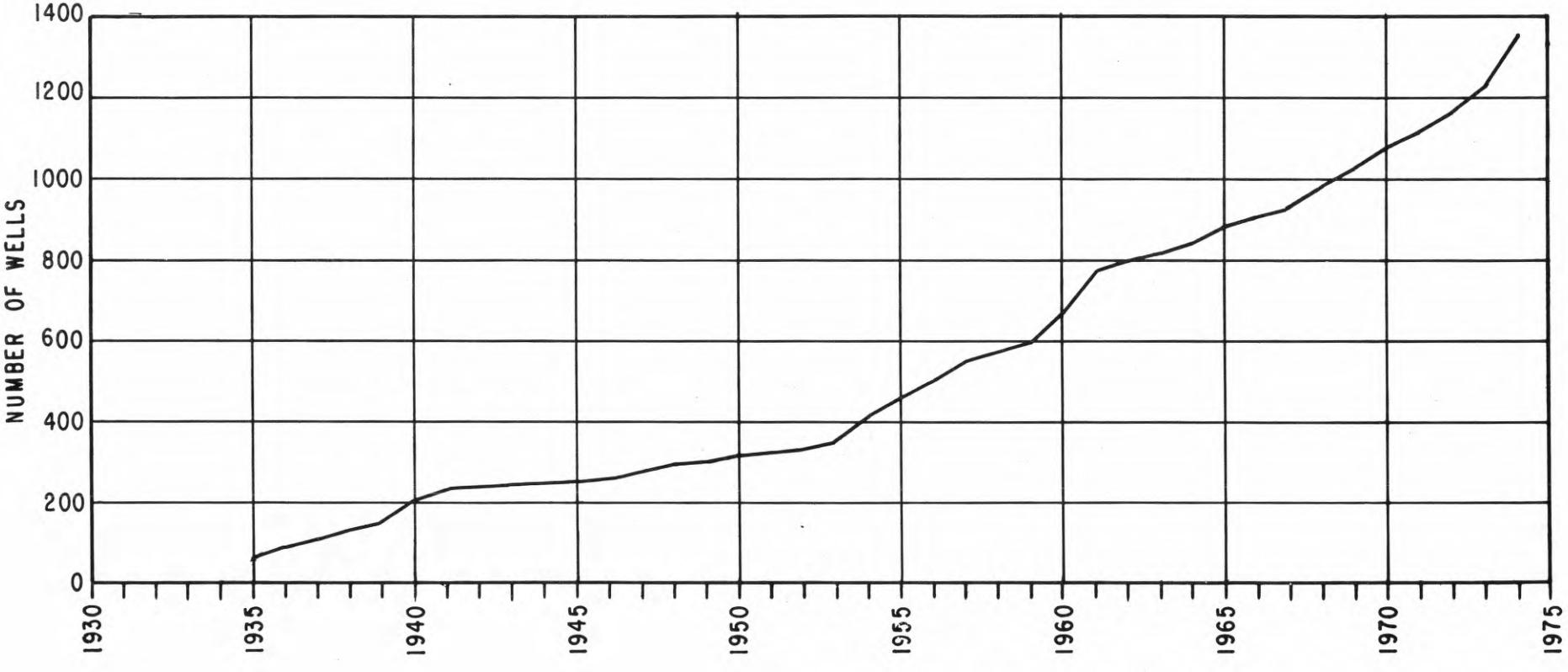

Figure 7.--Cumulative totals of registered irrigation wells in the North Platte River basin in Nebraska, 1930-74.

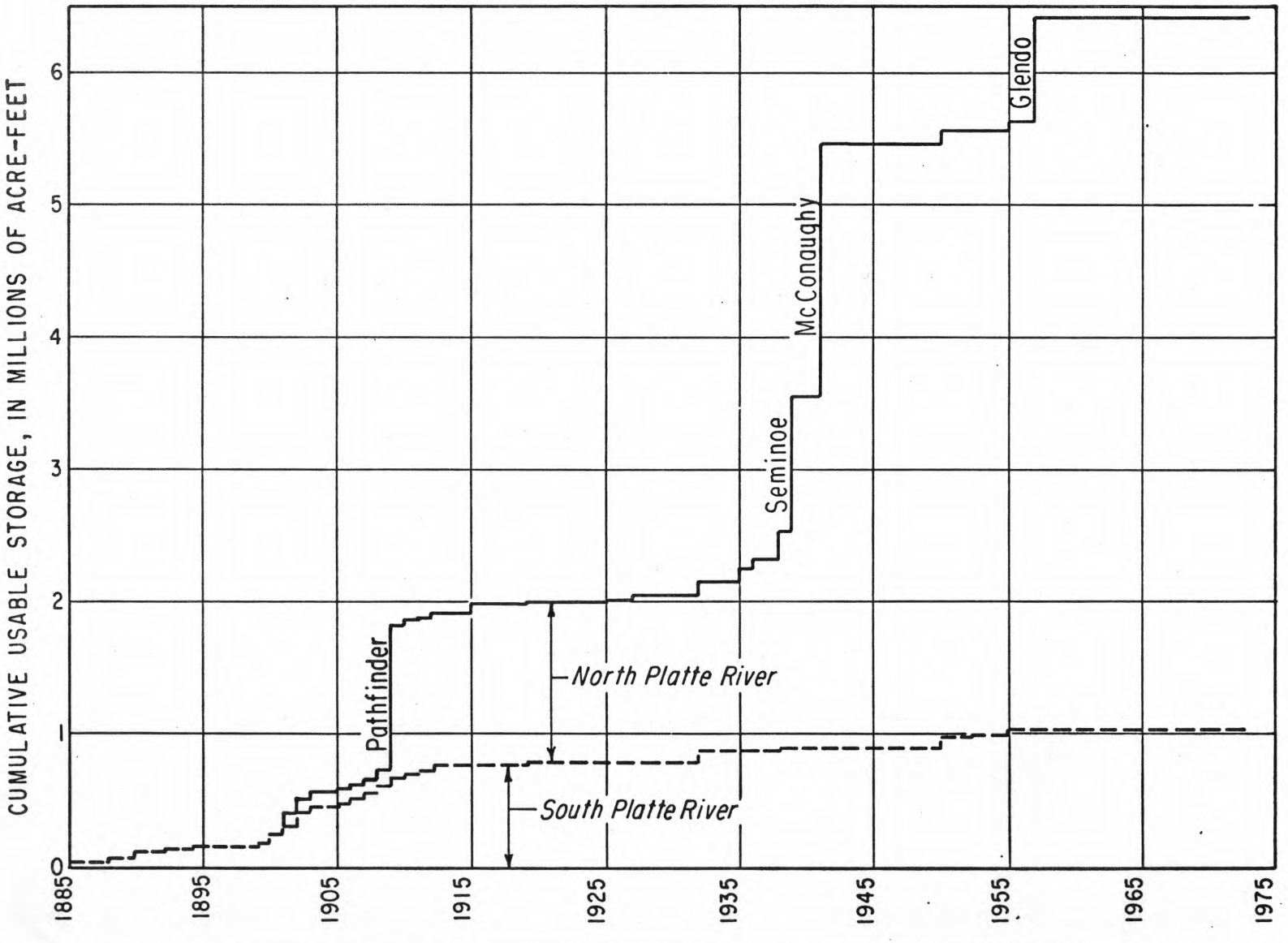

Figure 8.--Cumulative usable storage in the North and South Platte River basins.

Water use for power

No on-river hydroelectric powerplants have been built on the North or South Platte Rivers in Nebraska.

The Platte Valley Public Power and Irrigation District has two canals; one designed to divert 1,750 ft^3/s (49.6 m^3/s) from the North Platte River 2 mi (3.2 km) below Keystone Dam, the other to divert 500 ft^3/s (14 m^3/s) from the South Platte River near Korty. Water diverted from the North Platte is conveyed downvalley by the Sutherland Supply Canal to a point north of Paxton, then south through a deep cut to the South Platte River, where it is siphoned under that river via a 1.5-mi (2.4-km) tunnel. The Sutherland Supply Canal is joined near the tunnel outlet by a canal that diverts from the South Platte at Korty. The combined flows then are conveyed to the North Platte hydroelectric powerplant south of North Platte (fig. 9). After passing through the powerplant, which has a generating capacity of 26 megawatts, water is returned to the South Platte River a short distance above its junction with the North Platte.

SOUTH PLATTE RIVER DRAINAGE SYSTEM

The South Platte River drains a total of about 24,300 mi^2 (62,900 km^2)--19,200 mi^2 (49,700 km^2) in Colorado and Wyoming and 5,100 mi^2 (13,209 km^2) in Nebraska. (See fig. 1.) Rising in the mountains of central Colorado, about 60 mi (97 km) southwest of Denver, its principal source of streamflow is snowmelt. Altitudes range from 12,500 ft (3,810 m) in the uppermost reaches to 2,800 ft (853 m) where it joins the North Platte River near North Platte, Nebr., to become the Platte River.

From its uppermost reach, the South Platte River flows southeastward to a point about 60 mi (97 km) south-southwest of Denver; thence north-northeastward through Denver to Greeley; generally eastward to Fort Morgan; northeastward to Julesburg, near the northeast corner of Colorado; and finally nearly eastward to its junction with the North Platte. River distance is about 370 mi (595 km) in Colorado and about 80 mi (129 km) in Nebraska. The gradient of the river within Nebraska is about 8.2 ft/mi (1.6 m/km).

History of irrigation

Irrigation in the South Platte River basin began about the time mining was being developed in central Colorado. The first ditch was built in 1859 along Clear Creek. The first systems were individually owned, crudely constructed, and the lands irrigated were limited to creek valley bottoms. Completion of the Denver Pacific Railroad spurred settlement of the South Platte valley. Irrigation expanded rapidly in the basin and reached the point by the late 1870's where natural summer flows were being fully used.

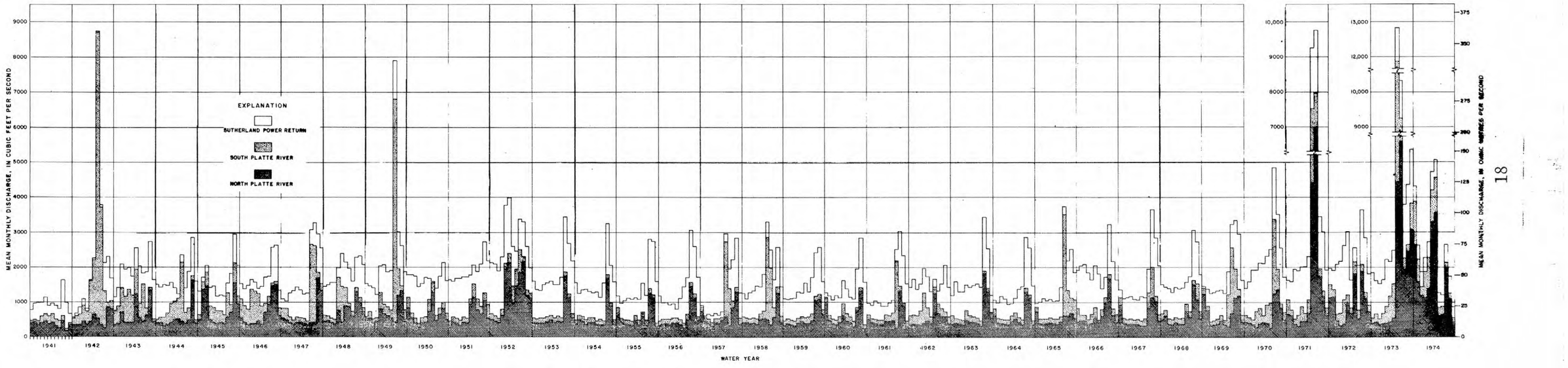

Figure 9.--Mean monthly discharge of Platte River below confluence of the North and South Platte Rivers during water years 1942-74.

Beginning in the 1880's, building of storage reservoirs proceeded at a rapid pace (see fig. 8). Several dams were constructed to provide reservoirs for a dependable water supply for Denver and to supply water for the increasing irrigated acreage downvalley from Denver. By 1900, irrigation in Colorado had nearly reached the present stage of development. Only minor canal extensions and additional storage facilities have since been built.

By 1930, the 96 reservoirs in the Colorado part of the South Platte River basin had a reported combined capacity of 1.0 million acre-ft (1.2 km^3), and 197 ditches carried water to irrigate 1.35 million acres (546,000 hm^2). (U.S. Cong., House Doc. 197, p. 92, 120).

Some water is imported to the South Platte River basin from the North Platte River and the Colorado River. In 1930, an annual average of 44,400 acre-ft (54.7 hm^3) was being imported for irrigation use only. However, completion of the Alva B. Adams Tunnel in 1946 and the Moffat Tunnel in 1959 increased severalfold the volume of imported water, which in 1973 amounted to more than 300,000 acre-ft (370 hm^3). Part of the increased water supply is used to generate hydroelectric power before being used for irrigation. Because imported water is used in Colorado, the volume of flow of the South Platte at the Colorado-Nebraska State line virtually is unaffected by the importation of water.

Discharge of the South Platte River where it enters Nebraska is affected slightly by irrigation developments along Lodgepole Creek in Nebraska. Until the Kimball irrigation project became operative in 1911, all diversions for irrigation along Lodgepole were into privately owned ditches. Oliver Reservoir, 7 mi (11 km) upstream from Kimball, and a 34-mi (55-km) canal are the principal features of the Kimball project. Although designed to serve 7,200 acres (2,900 hm^2), in recent years these facilities have not been fully operative. Bennett Reservoir, built in the late 1920's, is small and now is partly filled with sediment. In 1974, about 10,750 acres (4,350 hm^2) of land were irrigated with water diverted from Lodgepole Creek.

Western Canal, built in the late 1890's, diverts water from the South Platte River about 1 mi (1.6 km) downstream from the Colorado-Nebraska State line. The canal's initial capacity was 400 ft^3/s (11 m^3/s) and, under terms of the South Platte Compact, the project is entitled to 120 ft^3/s (3.4 m^3/s) when available. In 1974, about 23,000 acre-ft (28 hm^3) were diverted from the South Platte River into Western Canal to irrigate 12,600 acres (5,100 hm^2). Water diverted from the South Platte River irrigates a total of about 14,000 acres (5,670 hm^2) in Nebraska.

Irrigation with water pumped from wells now extends to all parts of the South Platte River basin with the greatest concentration of wells in Keith County. (See fig. 6.) Irrigation with ground water has increased quite uniformly since 1934 (fig. 10). Wells supply water to approximately 140,000 acres (57,000 hm^2) in the basin.

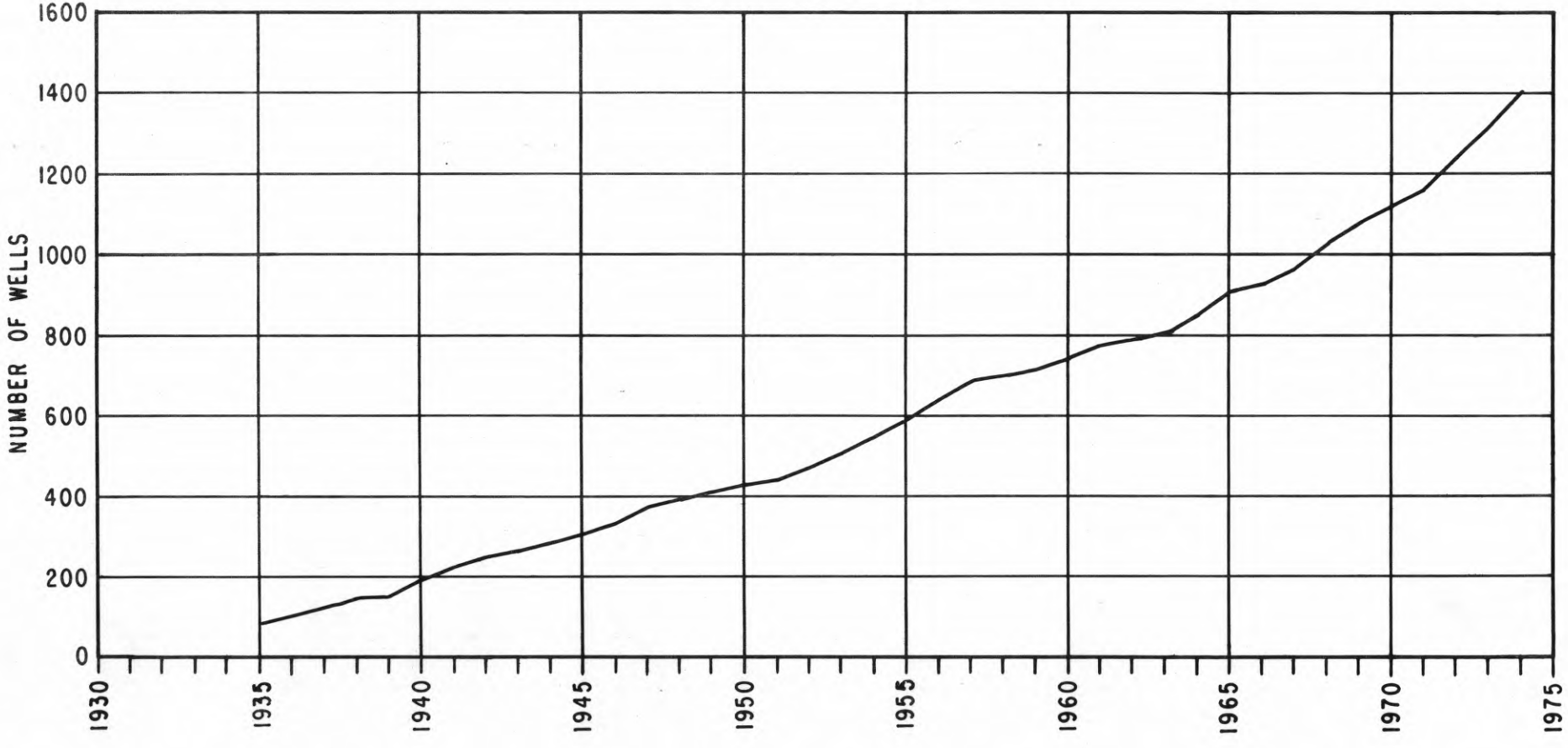

Figure 10.--Cumulative totals of registered irrigation wells in the South Platte River basin in Nebraska, 1930-74.

Floods

The largest flood on the South Platte River in Nebraska was 37,100 ft^3/s (1,050 m^3/s). It occurred at North Platte, on June 3, 1935. More recent floods of 22,200 ft^3/s (628 m^3/s) on June 22, 1965, and 20,900 ft^3/s (591 m^3/s) on May 13, 1973, also were recorded at North Platte. Greatest flood damage occurred in the Denver, Colo., area as a result of the 1965 flood. Chatfield Dam on the South Platte River upstream from Denver recently was completed by the U.S. Army Corps of Engineers and is designed to store enough water to prevent a recurrence of severe flooding in the Denver area. No large flood storage reservoirs exist on the lower part of the stream, however, and a potential for flooding still exists along the South Platte River in Nebraska.

Water use for power

In addition to its right to divert water from the North Platte River into the Sutherland Supply Canal, the Platte Valley Public Power and Irrigation District (Nebraska Public Power District) also has a water right to divert 500 ft^3/s (14 m^3/s) from the South Platte River near Korty, Nebr. The canal has a capacity of 1,250 ft^3/s (35.4 m^3/s), however, and diverts unappropriative nonseasonal flows in excess of the 500 ft^3/s (14 m^3/s) appropriation. Water was first turned into the canal at Korty on November 13, 1946. This water is delivered to the Sutherland Supply Canal near Paxton, Nebr., where it is combined with North Platte River water and conveyed to the North Platte hydroelectric powerplant south of North Platte. Water passing through the powerplant is returned to the South Platte River a short distance above its junction with the North Platte River. This is the only place where South Platte River water is used for power generation in Nebraska.

STREAMFLOW STATISTICS

Gaging stations in the North and South Platte River drainage basins and principal tributaries and canals between the gaging stations are described in downstream order beginning on page 23 . Characteristics of streamflow at specific gaging stations are shown in statistical tables derived from discharge records.

SELECTED BIBLIOGRAPHY

National Oceanic and Atmospheric Administration, Nebraska climatological data: NOAA ann. and summ. repts.

Nebraska Department of Agriculture, 1974, Nebraska agricultural statistics, 1968: Agr. ann. rept., 168 p.

Nebraska Department of Health, 1969, Water quality standards, 50 p.

Nebraska Department of Water Resources, 1927-54, Biennial reports to the Governor of Nebraska: Lincoln, Nebr.

_____1955-72, Biennial hydrographic reports: Lincoln, Nebr.

_____Unpublished data from files.

U.S. Bureau of Reclamation, 1948, Reclamation project data, 489 p.

_____1966, Reclamation project data supplement, 275 p.

U.S. Corps of Engineers, 1934, Platte River, Colo., Wyo., and Nebr.: House doc. no. 197, 73d Cong., 2d sess., 533 p.

U.S. Geological Survey, 1928-70, Surface water supply of the United States: See page 2 of this report.

_____1958, Compilation of records of surface waters of the United States through September 1950, Part 6-B: U.S. Geol. Survey Water-Supply Paper 1310.

_____1964, Compilation of records of surface waters of the United States, October 1950 to September 1960, Part 6-B: U.S. Geol. Survey Water-Supply Paper 1730.

_____1971-74, Water resources data for Nebraska, Part 1: U.S. Geol. Survey ann. repts.

_____Unpublished data from files.

INTERSTATE (PATHFINDER IRRIGATION DISTRICT) CANAL

Interstate Canal receives water at the left bank (looking downstream) of the North Platte River at the Whalen Diversion Dam. It has a priority date of September 19, 1904, for 1,572 ft^3/s (44.5 m^3/s). The canal is 179 mi (288 km) long and had an initial capacity of 2,200 ft^3/s (62.3 m^3/s). In addition to the canal, there are 670 mi (1,080 km) of laterals and 115 mi (185 km) of drains. The canal extends east from the point of diversion to Lake Alice, thence into Lake Minatare. The High Line Canal continues eastward to a point about 6 mi (10 km) north of Bayard. The Low Line Canal extends from Lake Minatare eastward to a point about 8 mi (12.9 km) northeast of Bridgeport. Summer streamflows are diverted and applied to the project lands, while nonseasonal flows are diverted to be stored in Lakes Alice and Minatare, which were completed in 1913 and 1915, respectively. Both are in Scotts Bluff County, Nebr. The first division of the canal was completed during the summer of 1907, and water was first diverted April 24, 1915. On June 1, 1926, the Bureau of Reclamation transferred the project to the Pathfinder Irrigation District. The District irrigates 13,375 acres (5,413 hm^2) in Wyoming and 100,940 acres (40,850 hm^2) in Nebraska.

FORT LARAMIE (PATHFINDER IRRIGATION DISTRICT) CANAL

Fort Laramie Canal receives water at the right bank of the North Platte River at the Whalen Diversion Dam. It has a water-right date of September 19, 1904, for 784 ft^3/s (22.2 m^3/s). The canal's initial capacity was 1,500 ft^3/s (42.5 m^3/s), and it is 180 mi (290 km) long. In addition to the canal, there are 516 mi (830 km) of laterals and 75 mi (121 km) of drains. The canal extends east into Nebraska from the diversion dam to a point about 4 mi (6.4 km) southwest of Minatare, Nebr. Water was first diverted into the canal April 24, 1915. Horse Creek Diversion Dam, part of the project to divert excess water from Horse Creek, was built in 1923. On January 1, 1927, the Bureau of Reclamation transferred the Wyoming part of the project to the Goshen Irrigation District and the Nebraska part to the Pathfinder Irrigation District. The project irrigates 50,210 acres (20,320 hm^2) in Wyoming and 54,087 acres (21,890 hm^2) in Nebraska.

MITCHELL CANAL

The Mitchell Canal and Irrigation Company was incorporated on June 20, 1890, and has a stream allocation for 194.29 ft^3/s (5.50 m^3/s). Construction on the project began August 18, 1890, and continued until July 1891. During that time, 28 mi (45 km) of canal were built. Water was first diverted from the right bank of the North Platte River in 1891. Practically all construction work was by subscribers who were paid for their labor with stock. The diversion dam and headgate of the canal on the right bank of the North Platte River is in Wyoming, just west of the State line, but all irrigated land is in Nebraska. A notice to appropriate water was filed in Laramie County, Wyo., but the water rights never were adjudicated under laws of Wyoming. The appropriation was held under the vested right of continuous beneficial use. In November 1940, the Nebraska Bureau of Irrigation, Water Power and Drainage, Department of Roads and Irrigation formally accepted appropriation for the foregoing date and amount to irrigate 13,633 acres (5,517 hm^2) in Nebraska. In accordance with an agreement made in 1897, the Mitchell Canal carries the Gering Canal water (see Gering Canal). The Mitchell District has a contract dated June 12, 1958, for 12,000 acre-ft (14.8 hm^3) of storage in Glendo Reservoir.

GERING CANAL

The Gering Irrigation District, organized August 12, 1895, has two water rights. One is for 15.87 ft^3/s (0.45 m^3/s) and the other is for 193.00 ft^3/s (5.46 m^3/s), each with a priority date of March 5, 1897.

In 1897, an agreement was made with the Mitchell Canal under which the Gering Irrigation District built diversion works a short distance east of the State line to turn water into the Mitchell Canal through a short ditch, then out where the Canal ends. Under the agreement, the Gering Irrigation District was granted a right to run water through the entire length of the canal. In return, the Gering District enlarged the ditch 2½ times the original capacity and agreed to pay 25 percent of the superintendent's salary and 55 percent of operating expenses.

Construction work began in 1898 and was completed in 1900. In addition to enlarging 28 mi (45 km) of existing canal, 25 mi (40 km) of new canal was built. Water from the right bank of the North Platte River was first diverted into the canal in 1901 and was continued until 1947 when the Gering diversion works was abandoned. Since then, water to irrigate the 13,600 acres (5,500 hm^2) in Gering valley has been diverted at the headgate of Mitchell Canal.

The District has a Warren Act Contract dated August 4, 1914, for 35,500 acre-ft (43.8 hm^3) storage in Pathfinder Reservoir.

06674500 North Platte River at Wyoming-Nebraska State line

LOCATION.--Lat 41°59'25", long 104°02'57", in SW¼NE¼SE¼ sec.4, T.23 N., R.58 W., Scotts Bluff County, Nebr., on right bank 700 ft (213 m) downstream from Wyoming-Nebraska State line, 650 ft (198 m) upstream from bridge on Nebraska State Highway 86, and 0.5 mi (0.8 km) south of Henry, Nebr. Prior to Feb. 23, 1972, at site 0.5 mi (0.8 km) upstream.

DRAINAGE AREA.--26,177 mi^2 (67,798 km^2), of which 5,888 mi^2 (15,250 km^2) (including 3,959 mi^2 or 10,254 km^2 in Great Divide Basin in southern Wyoming) probably is noncontributing.

PERIOD OF RECORD.--April 1929 to September 1973.

REMARKS.--Streamflow is affected by transbasin diversions, storage reservoirs, power developments, ground-water withdrawals, diversions for irrigation, and return flow. Gering-Mitchell Canal diverts from right bank 0.8 mi (1.3 km) upstream.

Monthly and annual mean discharges, water years 1958-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	574	271	458	83	18	4.96
November....	433	285	365	40	11	3.95
December....	375	264	312	33	10	3.38
January.....	322	181	270	38	14	2.93
February....	473	205	277	59	21	3.00
March.....	2,220	192	404	488	121	4.38
April.....	2,370	175	600	617	103	6.50
May.....	7,230	137	1,350	2,120	157	14.66
June.....	7,310	207	1,740	2,200	127	18.81
July.....	3,590	964	1,430	720	50	15.55
August.....	3,670	784	1,240	656	53	13.45
September...	2,360	583	778	426	55	8.43
Annual.....	2,240	398	772	541	70	100

Duration of daily mean discharge, water years 1958-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
13	100	330	60.0	1,900	6.4
16	99.9	410	47.4	2,300	5.0
59	99.8	510	39.5	2,900	4.0
91	99.6	630	33.3	3,500	3.4
110	99.4	780	27.5	4,400	2.0
140	99.0	970	22.7	5,400	1.5
170	98.3	1,200	13.7	6,800	1.1
210	95.2	1,500	7.6	8,400	.4
270	82.2				

Probability of annual high flows, water years 1958-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	989	977	954	945	940	900
50	2	2,000	1,900	1,810	1,700	1,500	1,290
10	10	5,390	5,140	4,950	4,680	4,200	3,440
4	25	8,880	8,570	8,350	8,010	7,470	6,110
2	50	12,800	12,500	12,300	11,900	11,500	9,470

Probability of annual low flows, climatic years, 1959-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	15	16	33	48	82	140
5	20	31	33	54	76	108	163
10	10	56	59	80	108	135	185
20	5	97	102	120	150	170	210
50	2	184	196	198	223	241	258

TRI-STATE (FARMERS IRRIGATION DISTRICT) CANAL

The Farmers Canal Company was organized August 31, 1887. The filing, on September 16, 1887, of the project's claim for irrigation water was the first to be filed in Nebraska.

Construction began in 1888 and continued until 1890. During this time, 10 mi (16 km) of canal were built. The diversion dam 1 mi (1.6 km) east of the State line diverted water at the left bank of the North Platte River. Water was first diverted into the canal in 1890. The project finally was suspended because of financial difficulties. Foreclosure proceedings were brought in 1898, and the canal was sold by Court order in 1901.

The Tri-State Land Company, organized in 1904, purchased rights of the Farmers Canal Company. In 1905, the canal was enlarged and extended to 96 mi (154 km) and was named the Tri-State Canal. A 28-mi (45-km) extension of the Tri-State Canal was called the Northport Canal, part of the North Platte Project. Tri-State Canal carries water released from Pathfinder Reservoir and return flow from the Pathfinder Irrigation District to Northport Project lands.

On October 14, 1912, landowners within the Farmers District voted bonds to purchase the canal system and water rights of the Tri-State Company. The main canal is 96 mi (154 km) long with 285 mi (459 km) of laterals and 80 mi (129 km) of drainage ditches to accommodate seepage and floodwaters.

The District has two natural-flow water rights. One is dated September 16, 1887, to irrigate 58,244 acres (23,570 hm^2); the other is dated April 14, 1902, to irrigate 2,913 acres (1,179 hm^2). It also has optional diversion rights from drains to irrigate 1,694 acres (686 hm^2)--a total of 62,851 acres (25,435 hm^2). The District has a Warren Act Contract dated August 20, 1912, for 180,000 acre-ft (222 hm^3) of storage in Pathfinder Reservoir.

RAMSHORN CANAL

In 1893, landowners in the Ramshorn Canal Irrigation District were incorporated into a mutual stock company. Ramshorn Canal Irrigation District has a water right for 45.71 ft^3/s (1.29 m^3/s) dated March 24, 1893, to take water from the left bank of the North Platte River about 3.25 mi (5.23 km) east of the Wyoming-Nebraska State line. Construction on the project began April 1893, and the 6.5 mi (10.4 km) of canal were completed in April 1894. About 4 mi (6.4 km) of the canal are now used to serve 1,652 acres (669 hm^2) south of Morrill, Nebr. According to a U.S. Supreme Court decree, Ramshorn District is the only canal in Nebraska having a claim on natural flow originating above Tri-State Dam. Tri-State Canal now diverts the 14 ft^3/s (0.40 m^3/s) allotted to Ramshorn and delivers the water to Ramshorn District lands.

06677500 Horse Creek near Lyman, Nebr.

LOCATION.--Lat 41°56'21", long 103°59'13", in SE¼NE¼ sec.25, T.23 N., R.58 W., Scotts Bluff County, on right bank 10 ft (3 m) upstream from county highway bridge, 1.8 mi (2.9 km) upstream from mouth, 2.2 mi (3.5 km) downstream from Owl Creek, and 3.2 mi (5.1 km) northeast of Lyman.

DRAINAGE AREA.--1,570 mi^2 (4,070 km^2), approximately, of which about 40 mi^2 (100 km^2) is noncontributing.

PERIOD OF RECORD.--February 1931 to September 1973.

REMARKS.--Horse Creek rises in the Laramie Mountains east of Laramie, Wyo., and flows eastward to a point near the Nebraska line where it turns sharply and flows northward for 25 mi (40 km). It then flows eastward to join the North Platte River about 4.5 mi (7.2 km) east of the State line. A considerable number of diversions have been made from Horse Creek in Wyoming. The stream is approximately 136 mi (219 km) in length with only a small part of the drainage area in Nebraska. Streamflow is affected by diversions, spills, and return flow.

Monthly and annual mean discharges, water years 1932-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	117	13	66	23	35	8.59
November....	62	11	38	11	29	5.02
December....	54	12	28	7.9	28	3.64
January.....	49	4.2	22	7.8	36	2.86
February....	72	7.8	27	15	56	3.47
March.....	108	7.4	30	23	78	3.85
April.....	107	9.4	29	21	71	3.83
May.....	233	8.4	78	52	67	10.14
June.....	352	10	135	76	56	17.55
July.....	199	12	89	45	51	11.59
August.....	273	5.9	83	47	57	10.78
September...	334	13	143	82	58	18.68
Annual.....	115	18	64	24	38	100

Duration of daily mean discharge, water years 1932-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
1.0	100	14	91.6	120	13.6
1.3	99.9	18	84.8	150	9.9
2.1	99.8	22	75.1	190	6.1
2.7	99.7	28	63.0	240	3.7
4.3	99.5	36	51.6	300	2.0
5.4	99.3	45	42.7	380	.9
6.8	98.7	58	34.0	480	.3
8.7	97.4	73	26.5		
11	95.7	92	19.2		

Probability of annual high flows, water years 1932-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	65	59	55	47	40	33
50	2	517	409	318	234	175	131
10	10	800	640	473	384	295	223
4	25	940	720	509	435	341	261
2	50	1,020	780	527	465	370	286
1	100	1,120	820	538	489	395	308

Probability of annual low flows, climatic years, 1933-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0.44	0.51	0.75	1.4	2.0	7.3
2	50	.78	.90	1.2	2.0	3.0	8.3
5	20	1.6	1.9	2.4	3.6	5.0	10
10	10	2.8	3.2	4.0	5.5	7.3	12
20	5	4.9	5.6	6.6	8.3	11	14
50	2	10	11	13	14	18	20

06678000 Sheep Creek near Morrill, Nebr.

LOCATION.--Lat 41°57'50", long 103°56'20", in NW¼SW¼ sec.16, T.23 N., R.57 W., Scotts Bluff County, on right bank 40 ft (12 m) upstream from Burlington Northern, Inc., bridge, 50 ft (15 m) downstream from bridge on U.S. Highway 26, 1 mi (1.6 km) west of Morrill, and 1.5 mi (2.4 km) upstream from mouth.

DRAINAGE AREA.--362 mi^2 (938 km^2), of which about 25 mi^2 (65 km^2) is noncontributing.

PERIOD OF RECORD.--October 1931 to September 1973.

REMARKS.--Sheep Creek rises in Sioux County near the Wyoming-Nebraska State line and flows southward to join the North Platte River near Morrill, Nebr. Most of the flow originates from seepage and return flow from the Interstate and Tri-State Canals. Streamflow is further affected by diversions from and spills to Sheep Creek.

Monthly and annual mean discharges, water years 1932-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	142	3.4	96	32	33	14.68
November....	127	1.3	87	22	25	13.40
December....	110	32	80	17	22	12.25
January.....	104	.7	74	18	24	11.28
February....	97	.8	70	16	24	10.75
March.....	91	32	68	13	18	10.48
April.....	85	4.9	62	16	26	9.53
May.....	81	1.4	36	22	62	5.51
June.....	84	2.0	31	26	84	4.71
July.....	52	1.8	13	12	92	2.05
August.....	31	2.1	7.8	5.4	70	1.19
September...	94	2.4	27	22	82	4.17
Annual.....	76	29	54	12	22	100

Duration of daily mean discharge, water years 1932-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0.2	100	2.9	90.2	25	66.0
.3	99.9	3.7	85.3	32	65.6
.5	99.8	4.7	80.6	41	65.0
.7	99.6	6.0	77.4	52	61.1
.9	99.5	7.6	74.0	66	50.6
1.1	99.2	9.7	70.8	84	23.5
1.4	98.7	12	68.6	110	5.8
1.8	97.5	16	66.9	140	.5
2.3	94.0	20	66.4		

Probability of annual high flows, water years 1932-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	81	62	58	52	49	45
50	2	129	121	113	106	102	96
10	10	202	156	143	136	130	121
4	25	248	168	152	145	139	128
2	50	287	176	157	151	144	132
1	100	330	183	162	155	148	134

Probability of annual low flows, climatic years, 1933-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0.17	0.28	0.43	0.48	0.69	1.0
2	50	.26	.37	.53	.59	.85	1.2
5	20	.44	.56	.72	.81	1.2	1.6
10	10	.66	.79	.94	1.1	1.5	2.1
20	5	1.0	1.1	1.3	1.5	2.0	2.8
50	2	1.9	2.0	2.2	2.6	3.5	5.0

ENTERPRISE CANAL

The Enterprise Ditch Company organized on March 7, 1889, as a mutual stock company. It obtained a water right dated March 28, 1889, to divert 138.68 ft^3/s (3.925 m^3/s) from the left bank of the North Platte River at a point about 1.75 mi (2.82 km) south of Morrill, Nebr. Construction was started in 1889, and the 21-mi (34-km) canal was completed by 1895. Water was first diverted from the river, however, and applied to the land in the upper part of the project during the latter part of 1890. Water is also diverted into the canal from Dry Spottedtail Creek, Morrill Drain, Tub Springs, and Winters Creek to irrigate 7,666 acres (3,102 hm^2) between Mitchell and Scottsbluff, Nebr. The Enterprise Ditch Company was converted to a District on June 12, 1958, and has a contract for 3,000 acre-ft (3.7 hm^3) of Glendo Reservoir storage.

06679000 Dry Spottedtail Creek at Mitchell, Nebr.

LOCATION.--Lat 41°56'45", long 103°49'35", at southeast corner of sec.20, T.23 N., R.56 W., Scotts Bluff County, on right bank 5 ft (1.5 m) upstream from bridge on county road, 0.5 mi (0.8 km) west of Mitchell, and 0.8 mi (1.3 km) upstream from mouth.

DRAINAGE AREA.--77.2 mi^2 (199.9 km^2).

PERIOD OF RECORD.--October 1948 to September 1973.

REMARKS.--Dry Spottedtail Creek originates in southwest Sioux County and flows southward to join the North Platte River near Mitchell, Nebr. Most of the flow originates from seepage and return flow from the Interstate and Tri-State Canals. Streamflow also is affected by diversions from and spills to Dry Spottedtail.

Monthly and annual mean discharges, water years 1949-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	85	19	42	16	38	10.49
November....	54	13	30	13	43	7.40
December....	56	10	25	12	49	6.26
January.....	48	13	25	10	42	6.25
February....	42	12	25	8.4	34	6.20
March.....	44	15	24	7.5	31	6.00
April.....	58	16	26	9.2	36	6.45
May.....	58	16	34	11	33	8.58
June.....	73	11	35	18	53	8.71
July.....	92	13	39	24	61	9.74
August.....	94	7.6	42	24	59	10.37
September...	109	21	54	27	50	13.55
Annual.....	55	17	33	12	36	100

Duration of daily mean discharge, water years 1949-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
3.0	100	12	95.2	52	14.9
3.5	99.9	15	89.5	61	10.4
4.1	99.8	17	83.9	71	6.8
4.8	99.7	20	72.6	83	4.1
5.7	99.5	24	59.2	98	1.5
6.6	99.2	28	49.2	110	.7
7.8	98.8	32	40.3	130	.3
9.1	97.9	38	30.9	160	.1
11	96.3	44	22.5		

Probability of annual high flows, water years 1949-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	60	52	38	28	24	21
50	2	126	99	86	68	56	49
10	10	261	169	122	103	93	83
4	25	364	213	137	117	112	103
2	50	461	249	148	128	127	118
1	100	577	290	157	137	142	134

Probability of annual low flows, climatic year 1950-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0.94	1.2	2.4	3.5	4.8	7.4
2	50	1.3	1.7	3.1	4.3	5.7	8.4
5	20	2.1	2.6	4.2	5.6	7.0	9.8
10	10	3.2	3.8	5.5	7.0	8.6	11
20	5	5.2	6.1	7.6	9.0	11	13
50	2	10	11	12	13	15	18

06679500 North Platte River at Mitchell, Nebr.

LOCATION.--Lat 41°55'38", long 103°48'48", in NE¼NE¼ sec.33, T.33 N., R.56 W., Scotts Bluff County, near right bank of main channel on downstream side of pier of bridge on State Highway 29, 0.5 mi (0.8 km) south of Mitchell.

DRAINAGE AREA.--28,300 mi^2 (73,300 km^2), approximately, of which about 5,980 mi^2 (15,500 km^2) is noncontributing.

PERIOD OF RECORD.--May 1920 to September 1973.

REMARKS.--Streamflow is affected by transmountain diversions, storage reservoirs, power development, diversions for irrigation, and return flow from irrigated areas.

Monthly and annual mean discharges, water years 1958-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	946	478	759	128	17	8.91
November....	809	478	616	83	14	7.23
December....	689	411	535	65	12	6.27
January.....	594	368	476	58	12	5.59
February....	663	382	470	68	15	5.51
March.....	2,210	389	573	441	77	6.72
April.....	2,890	278	781	687	88	9.17
May.....	7,390	232	1,230	2,230	182	14.39
June.....	7,100	130	1,600	2,150	134	18.82
July.....	2,350	130	568	658	116	6.66
August.....	2,730	137	383	631	165	4.49
September...	2,480	171	532	542	102	6.24
Annual.....	2,200	330	710	568	80	100

Duration of daily mean discharge, water years 1958-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
53	100	330	76.3	2,100	5.5
63	99.9	390	70.3	2,500	4.3
74	99.8	460	54.2	2,900	3.2
88	99.5	550	35.6	3,400	2.5
100	98.5	650	23.6	4,000	2.1
120	96.9	760	16.8	4,800	1.7
140	94.6	900	12.0	5,600	1.5
170	91.0	1,100	8.9	6,700	1.1
200	87.7	1,300	7.7	7,900	.5
240	83.7	1,500	7.1	9,300	.2
280	80.7	1,800	6.4		

Probability of annual high flows, water years 1941-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	640	557	498	458	470	455
50	2	2,220	1,990	1,720	1,460	1,150	890
10	10	5,910	5,310	4,760	4,190	3,390	2,460
4	25	8,970	8,050	7,380	6,710	5,690	4,200
2	50	11,900	10,700	9,970	9,310	8,270	6,250
1	100	15,600	14,000	13,300	12,700	11,900	9,260

Probability of annual low flows, climatic years 1959-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	38	39	49	63	80	98
5	20	48	49	61	74	96	114
10	10	61	63	72	87	110	134
20	5	73	76	84	100	127	155
50	2	108	111	119	136	172	214

06680000 Tub Springs near Scottsbluff, Nebr.

LOCATION.--Lat 41°54'55", long 103°42'55", in SW¼SW¼ sec.33, T.23 N., R.55 W., Scotts Bluff County, 50 ft (15 m) upstream from bridge, 0.2 mi (0.3 km) downstream from headgate of Enterprise Canal, 1.5 mi (2.4 km) upstream from mouth, and 3.5 mi (5.6 km) northwest of Scottsbluff.

PERIOD OF RECORD.--October 1948 to September 1973.

REMARKS.--Tub Springs Creek originates in the extreme north-central part of Scotts Bluff County and flows southwestward to join the North Platte River about 4 mi (6 km) northwest of Scottsbluff, Nebr. The source of supply is seepage from the Interstate Canal, Lake Alice, and Tri-State and Enterprise Canals. Streamflow is affected by diversions from and spills to Tub Springs.

Monthly and annual mean discharges, water years 1949-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	91	37	59	13	22	13.44
November....	70	32	47	8.8	19	10.79
December....	52	30	39	5.8	15	8.91
January.....	44	26	33	4.4	13	7.57
February....	40	24	30	3.8	13	6.88
March.....	40	21	28	3.9	14	6.52
April.....	41	16	29	5.6	20	6.57
May.....	68	13	34	12	34	7.82
June.....	74	10	42	16	37	9.65
July.....	45	2.6	27	14	50	6.13
August.....	51	3.1	22	15	69	4.99
September...	79	10	47	16	35	10.73
Annual.....	46	24	36	6.2	17	100

Duration of daily mean discharge, water years 1949-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0.8	100	5.2	93.8	32	57.7
1.0	99.7	6.3	93.1	39	37.5
1.2	99.3	7.5	92.3	47	23.0
1.5	98.6	9.0	91.6	56	13.3
1.7	98.1	11	90.7	67	6.8
2.1	97.6	13	89.7	81	3.1
2.5	97.1	16	88.2	97	.9
3.0	96.3	19	86.8	120	.2
3.6	95.4	22	85.1	140	.1
4.3	94.7	27	76.0		

Probability of annual high flows, water years 1949-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	65	63	51	48	41	36
50	2	123	102	87	71	63	54
10	10	236	147	108	93	79	68
4	25	316	171	115	104	85	74
2	50	389	189	120	112	89	78
1	100	474	208	124	121	93	82

Probability of annual low flows, climatic years 1950-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0.26	0.30	0.34	0.42	1.1	1.2
2	50	.32	.36	.45	.57	1.5	1.8
5	20	.44	.50	.66	.90	2.3	3.2
10	10	.61	.69	.97	1.4	3.4	5.1
20	5	.94	1.1	1.6	2.2	5.8	9.3
50	2	2.4	2.8	4.1	5.8	12	18

WINTERS CREEK CANAL

The Winters Creek Irrigation Company, incorporated October 1, 1888, obtained a water right October 18, 1888, to divert 124.29 ft^3/s (3.520 m^3/s) from the left bank of the North Platte River, about 3.25 mi (5.23 km) northwest of Scottsbluff, Nebr. Construction was begun November 1888; however, no contract was let. Each of the 16 shareholders was permitted to work out 90 percent of the par value of his stock; the other 10 percent was paid in cash. About 10 miles of the canal had been built by May 1, 1889. Water was diverted and flowed the entire length of the canal that season. The following year, the canal was enlarged and extended to the present length of 11.75 mi (18.91 km). The canal diverts from both the North Platte River and Winters Creek and irrigates about 5,748 acres (2,326 hm^2) in the area east and west of Scottsbluff, Nebr. During the early years of operation, the canal served as a common carrier, and the company assessed an annual charge per acre served for delivering water to the headgate of each lateral.

CENTRAL CANAL

The Mutual Irrigation and Water Power Company organized in June 1890 and was incorporated under the laws of Nebraska. The Company obtained a water right dated June 23, 1890, to divert 36.00 ft^3/s (1.019 m^3/s) from the right bank of the North Platte River northeast of Gering. By July 1, 1891, 4.5 mi (7.2 km) of canal had been completed. A large pump was installed to lift water from the river into the canal; however, the pumping operation was found to be too costly. The Mutual Irrigation and Water Power Company was purchased by the Central Irrigation and Water Power Company in November 1891. Thereafter, the pumping plant was abandoned, and a permit was obtained to change diversion upstream to a point about 2.25 mi (3.6 km) southwest of Scottsbluff, Nebr. The Central Irrigation and Water Power Company reorganized as the Central Irrigation District on April 26, 1901. The Central Canal was extended to 9.5 mi (15.3 km) and irrigates 2,154 acres (872 hm^2) north and east of Gering, Nebr. The District has a Warren Act Contract dated August 4, 1914, for 4,050 acre-ft (4.99 hm^3) of Pathfinder Reservoir storage.

06681000 Winters Creek near Scottsbluff, Nebr.

LOCATION.--Lat 41°51'08", long 103°37'35", in NW¼SE¼ sec.30, T.22 N., R.54 W., Scotts Bluff County, on right bank 700 ft (213 m) downstream from bridge on U.S. Highway 26, 1 mi (1.6 km) upstream from mouth, and 1.5 mi (2.4 km) east of Scottsbluff.

PERIOD OF RECORD.--October 1931 to September 1973.

REMARKS.--Winters Creek rises in southeastern Sioux County and flows southwestward to join the North Platte River near Scottsbluff, Nebr. The source of supply is seepage from the Interstate, Tri-State, Enterprise, and Winters Creek Canals. Streamflow is affected by diversions from and spills to Winters Creek.

Monthly and annual mean discharges, water years 1932-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	116	46	78	16	20	12.13
November....	78	26	58	11	19	8.99
December....	72	35	52	9.0	17	8.15
January.....	66	36	49	7.8	16	7.72
February....	58	35	48	5.5	12	7.43
March.....	59	35	46	4.8	11	7.14
April.....	51	33	43	4.2	10	6.68
May.....	75	6.4	39	13	34	6.13
June.....	95	11	50	21	41	7.88
July.....	92	8.5	42	19	46	6.63
August.....	91	11	51	18	36	7.93
September...	122	25	84	23	27	13.19
Annual.....	68	35	53	8	15	100

Duration of daily mean discharge, water years 1932-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
1.1	100	9.5	97.1	58	32.5
1.3	99.9	11	96.7	69	18.8
2.2	99.8	14	95.4	83	10.1
2.7	99.7	16	94.5	99	5.3
3.2	99.6	19	93.1	120	2.3
3.8	99.5	23	91.4	140	.9
4.6	99.2	28	89.3	170	.3
5.5	98.8	34	86.5	200	.1
6.6	98.4	40	78.9		
7.9	97.9	48	54.6		

Probability of annual high flows, water years 1932-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	91	82	76	65	52	44
50	2	181	145	122	105	93	76
10	10	290	200	164	135	114	92
4	25	350	226	184	148	122	97
2	50	397	244	199	157	126	100
1	100	446	262	213	166	129	102

Probability of annual low flows, climatic years 1933-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0.50	0.70	0.80	1.0	2.6	6.3
2	50	.70	1.0	1.2	1.6	3.8	8.4
5	20	1.1	1.6	2.0	2.8	5.7	12
10	10	1.6	2.5	3.1	4.6	8.4	16
20	5	2.6	3.6	5.0	7.8	13	23
50	2	6.4	7.9	10	14	24	33

MINATARE CANAL

The Minatare Canal Company, organized in 1887, obtained a water right dated January 14, 1888, to divert 249.43 ft^3/s (7.064 m^3/s) from the left bank of the North Platte River at a point about 3.5 mi (5.6 km) southeast of Scottsbluff, Nebr. Construction on the project started in 1888. About 8 mi (13 km) of canal were completed, and water was diverted to irrigate lands during the late summer of 1888. This was the first canal in the upper valley of the North Platte River that diverted water to irrigate crops. During 1889, the company extended the canal and completed High Line and Low Line Canals, each about 9 mi(14 km) long. The Minatare Mutual Canal and Irrigation Company was incorporated and purchased assets of the Minatare Canal and Irrigation Company on May 14, 1895. Part of the original system has been abandoned and, at present, the canal is 9.7 mi (15.6 km) long. It is used to irrigate 9,372 acres (3,793 hm^2) near the town of Minatare, Nebr.

06681500 Gering drain near Gering, Nebr.

LOCATION.--Lat 41°49'20", long 103°37'02", in SE¼NE¼ sec.6, T.21 N., R.54 W., Scotts Bluff County, near left bank on downstream side of bridge piling on county road, 0.2 mi (0.3 km) downstream from bridge on State Highway 92, 1 mi (1.6 km) upstream from mouth, and 2 mi (3 km) east of Gering.

PERIOD OF RECORD.--February 1931 to September 1945; October 1948 to September 1973.

REMARKS.--Gering Drain originates below the Gering-Fort Laramie Canal in south-central Scotts Bluff County and flows northeastward to join the North Platte River near Gering, Nebr. The flow is seepage and return flow from the Ft. Laramie, Gering, and Central Canals.

Monthly and annual mean discharges, water years 1932-45; 1949-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	58	22	38	8.6	23	7.39
November....	46	22	33	5.4	17	6.30
December....	39	19	29	5.0	17	5.58
January.....	35	17	25	4.7	19	4.90
February....	34	16	24	4.1	17	4.63
March.....	33	17	24	4.2	17	4.62
April.....	35	16	24	4.1	17	4.66
May.....	76	21	44	16	37	8.42
June.....	175	25	67	33	50	12.94
July.....	194	13	68	35	51	13.20
August.....	132	7.7	62	26	42	12.01
September...	190	13	79	43	54	15.35
Annual.....	75	24	43	12	27	100

Duration of daily mean discharge, water years 1932-45; 1949-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
5.7	100	28	59.6	120	3.6
6.5	99.9	32	46.3	140	2.4
7.5	99.8	37	36.0	160	1.5
9.7	99.7	42	29.8	180	1.0
11	99.6	48	25.1	210	.7
13	99.3	55	20.9	240	.4
15	99.0	63	17.2	270	.3
17	97.2	72	13.1	350	.2
19	92.8	82	9.7	410	.1
22	84.5	94	6.8		
25	72.1	110	4.6		

Probability of annual high flows, water years 1932-45; 1949-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	63	54	41	35	32	29
50	2	292	194	142	110	89	75
10	10	752	383	246	191	150	125
4	25	1,080	490	293	230	181	150
2	50	1,380	574	327	259	203	168
1	100	1,720	661	359	287	226	187

Probability of annual low flows, climatic years 1933-45; 1949-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	3.6	4.8	5.7	6.2	7.5	10
2	50	4.7	5.9	7.0	7.6	9.0	11
5	20	6.5	7.8	9.0	9.8	11	14
10	10	8.6	9.8	11	12	13	16
20	5	12	13	15	16	17	20
50	2	17	18	19	20	22	24

CASTLE ROCK CANAL

The Castle Rock Irrigation and Water Power Company incorporated in April 1889, obtained a water right dated April 18, 1889, to divert 82.57 ft^3/s (2.338 m^3/s) from the right bank of the North Platte River about 4 mi (6.4 km) west of Minatare, Nebr. Construction on 17 mi (27 km) of main canal and 3 mi (5 km) of low-line laterals was started during the summer of 1889 and completed in 1896. The Castle Rock Irrigation District was authorized June 13, 1898; however, the District did not obtain possession of the canal until 1912. The main canal is now 15.8 mi (25.4 km) long and is used to irrigate about 6,500 acres (2,630 hm^2) in the area surrounding the town of McGrew, Nebr. Water is delivered to the Steamboat Canal project via Castle Rock Canal. Steamboat Canal has a water right dated October 27, 1895, for 6.20 ft^3/s (0.175 m^3/s) to irrigate 434 acres (176 hm^2) and another dated July 22, 1896, for 0.71 ft^3/s (0.020 m^3/s) to irrigate another 50 acres (20 hm^2).

NINEMILE CANAL

The Bayard Irrigation Canal and Water Power Company was incorporated in 1890 and, on November 28, 1890, posted a notice of water right on the left bank of the North Platte River about 1.5 mi (2.4 km) south of Minatare, Nebr. Construction was started after posting notice; but owing to financial difficulties, work was discontinued in the summer of 1891. In August 1893, the Ninemile Canal and Reservoir Company was incorporated and purchased the rights of the Bayard Irrigation Canal and Water Power Company. A new notice of water rights with a priority date of December 6, 1893, was filed for 200.00 ft^3/s (5.66 m^3/s). The canal was completed to a length of 18.7 mi (30 km) in 1894. The canal, operated by the Ninemile Irrigation District, now diverts water from both the North Platte River and Red Willow Creek to irrigate 6,049 acres (2,448 hm^2) in the vicinity of Bayard, Nebr.

06682000 North Platte River near Minatare, Nebr.

LOCATION.--Main channel gage, lat 41°47'26", long 103°31'11", in NE¼SE¼ sec.13, T.21 N., R.54 W., Scotts Bluff County, on left bank 220 ft (67 m) upstream from bridge on State Highway 326 and 1.8 mi (2.9 km) southwest of Minatare. Ninemile channel gage, lat 41°47'32", long 103°31'08", in NE¼SE¼ sec.13, T.21 N., R.54 W., Scotts Bluff County, on left bank 50 ft (15 m) upstream from bridge on State Highway 326 and 750 ft (229 m) north of main channel bridge.

DRAINAGE AREA.--28,700 mi^2 (74,300 km^2), approximately.

PERIOD OF RECORD.--June 1923 to September 1973.

REMARKS.--Streamflow is affected by transmountain diversions, storage reservoirs, power development, ground-water withdrawals, diversions for irrigation and return flow.

Monthly and annual mean discharges, water years 1958-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	1,370	744	1,040	156	15	9.41
November....	1,100	723	896	105	12	8.07
December....	914	606	774	72	9	6.97
January.....	806	525	696	73	10	6.26
February....	875	577	678	76	11	6.10
March.....	2,520	557	764	473	62	6.89
April.....	2,710	425	939	625	67	8.46
May.....	7,810	333	1,390	2,240	161	12.50
June.....	8,030	191	1,850	2,260	122	16.63
July.....	2,990	84	755	828	110	6.80
August.....	2,950	173	504	668	132	4.54
September...	3,020	267	818	637	78	7.37
Annual.....	2,440	499	925	600	65	100

Duration of daily mean discharge, water years 1958-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
21	100	240	92.1	1,800	7.2
27	99.9	300	88.6	2,200	6.2
33	99.7	380	84.2	2,800	4.1
52	99.5	470	79.9	3,500	2.7
65	99.3	590	70.0	4,300	2.1
81	99.1	740	44.5	5,400	1.6
100	98.7	920	23.8	6,700	1.1
130	97.4	1,100	14.7	8,400	.5
160	95.9	1,400	8.7	10,000	.1
200	94.1				

Probability of annual high flows, water years 1941-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	868	843	817	739	734	760
50	2	2,580	2,280	1,980	1,710	1,400	1,150
10	10	6,040	5,390	4,860	4,350	3,610	2,760
4	25	8,660	7,800	7,330	6,760	5,870	4,460
2	50	11,100	10,300	9,820	9,260	8,380	6,410
1	100	14,000	13,200	13,200	12,500	11,900	9,190

Probability of annual low flows, climatic years 1959-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	9.0	10	11	18	36	76
5	20	17	19	22	32	56	103
10	10	30	33	38	53	85	140
20	5	52	60	70	87	130	190
50	2	120	133	162	193	248	326

06682500 Ninemile drain near McGrew, Nebr.

LOCATION.--Lat 41°46'15", long 103°25'18", in SE¼SE¼ sec.23, T.21 N., R.53 W., Scotts Bluff County, on right bank 15 ft (5 m) upstream from highway bridge, 0.5 mi (0.8 km) upstream from mouth, and 1.5 mi (2.4 km) north of McGrew.

PERIOD OF RECORD.--January 1932 to September 1973.

REMARKS.--Ninemile drain originates in northeast corner of Scotts Bluff County and flows southwestward to join the North Platte River near McGrew, Nebr. The flow is seepage and return flow from the Interstate, Tri-State, Minatare, and Ninemile Canals. Streamflow is affected by diversions from and spills to Ninemile drain.

Monthly and annual mean discharges, water years 1933-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	198	93	146	25	17	10.35
November....	156	75	112	18	16	7.97
December....	130	72	97	14	15	6.87
January.....	112	65	85	12	14	6.06
February....	104	62	79	11	14	5.59
March.....	99	56	75	10	13	5.36
April.....	95	51	73	8.7	12	5.19
May.....	155	68	97	19	19	6.90
June.....	185	72	131	29	22	9.29
July.....	235	70	143	37	26	10.15
August.....	228	76	170	43	25	12.11
September...	254	95	199	47	23	14.16
Annual.....	148	81	117	18	15	100

Duration of daily mean discharge, water years 1933-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
29	100	90	61.1	200	8.8
33	99.9	100	51.0	230	4.0
49	99.8	110	43.0	250	2.5
54	99.4	120	35.9	280	1.1
60	98.2	140	25.5	310	.4
66	93.8	150	21.7	340	.2
74	83.4	170	15.9	380	.1
81	73.8	180	13.4		

Probability of annual high flows, water years 1933-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	171	135	123	113	105	95
50	2	338	288	253	227	210	191
10	10	556	404	323	287	264	241
4	25	682	453	346	305	280	257
2	50	784	485	359	316	290	266
1	100	893	515	370	325	298	274

Probability of annual low flows, climatic years 1934-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	14	17	23	30	42	54
2	50	20	23	30	35	47	59
5	20	31	33	44	49	56	61
10	10	44	46	50	53	59	64
20	5	52	54	58	59	63	67
50	2	64	65	67	68	70	75

SHORT LINE CANAL

The Short Line Irrigation Company, organized as a stock company by farmers in 1893, obtained a water right dated May 1, 1893, to divert 65.57 ft^3/s (1.856 m^3/s) from the left bank of the North Platte River about 4.5 mi (7.2 km) west of Bayard, Nebr. The stockholders built 5 mi (8 km) of canal shortly thereafter, and their project was duly authorized on August 19, 1912. The canal, operated by the Short Line Irrigation District, now irrigates 2,786 acres (1,127 hm^2) southwest of Bayard, Nebr.

CHIMNEY ROCK CANAL

The Chimney Rock Irrigation Canal and Water Power Company was incorporated in 1889. In June 1889, it posted a water-right notice on the right bank of the river about 3 mi (5 km) southwest of Bayard, Nebr., however, the water right is for 60.00 ft^3/s (1.698 m^3/s) dated December 3, 1890. Construction began in 1890, continued until June 1895, resumed in 1896, and was completed that year. The High Line Canal is 13 mi (21 km) long and the Low Line Canal is 4 mi (6 km) long. Chimney Rock Irrigation District was duly organized on November 22, 1896. It now includes about 5,273 acres (2,134 hm^2) south and east of Bayard and has a Warren Act Contract dated August 6, 1914, for 10,300 acre-ft (12.7 hm^3) of Pathfinder Reservoir storage.

06683000 Bayard Sugar Factory drain near Bayard, Nebr.

LOCATION.--Lat 41°44'10", long 103°19'53", in SE¼NE¼ sec.5, T.20 N., R.52 W., Morrill County, on right bank 600 ft (183 m) upstream from mouth and 1.2 mi (1.9 km) south of Bayard.

PERIOD OF RECORD.--October 1931 to September 1973.

REMARKS.--Bayard Sugar Factory Drain originates below the Tri-State Canal in the southeast corner of Scotts Bluff County and flows southeastward to join the North Platte River near Bayard, Nebr. The flow is seepage and return flow from the Tri-State and Ninemile Canals. Streamflow is affected by diversions from and spills to Bayard Sugar Factory drain.

Monthly and annual mean discharges, water years 1932-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	76	23	41	11	27	12.03
November....	55	23	35	7.6	22	10.26
December....	50	20	30	7.0	23	8.86
January.....	44	20	27	6.2	23	7.89
February....	39	18	26	5.3	20	7.53
March.....	37	16	25	5.3	21	7.29
April.....	33	3.6	21	7.9	37	6.20
May.....	49	1.4	18	11	63	5.08
June.....	68	6.1	26	13	52	7.41
July.....	43	.67	22	11	49	6.40
August.....	65	2.8	33	14	41	9.66
September...	90	7.1	39	18	45	11.39
Annual.....	48	17	29	7.1	25	100

Duration of daily mean discharge, water years 1933-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0	100	2.2	96.0	24	63.8
.1	99.8	2.8	95.2	30	42.5
.3	99.6	3.5	94.4	38	22.1
.4	99.3	4.5	93.5	48	9.1
.5	99.1	5.7	92.4	61	3.4
.7	98.6	7.2	90.9	77	1.3
.8	98.4	9.1	89.2	98	.3
1.1	97.6	12	87.1	120	.2
1.4	97.1	15	84.9		
1.7	96.7	19	80.6		

Probability of annual high flows, water years 1932-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	46	44	39	35	27	26
50	2	113	84	69	55	48	42
10	10	199	129	92	79	68	57
4	25	248	153	103	92	77	64
2	50	288	172	110	102	84	70
1	100	329	191	116	113	91	75

Probability of annual low flows, climatic years 1933-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0	0	0.08	0.16	0.36	1.2
2	50	0	0	.11	.23	.56	2.0
5	20	.02	.04	.19	.42	1.1	3.2
10	10	.06	.11	.31	.69	1.8	5.0
20	5	.20	.29	.57	1.2	3.2	7.9
50	2	1.0	1.2	1.8	3.5	8.1	15

ALLIANCE CANAL

The Alliance Irrigation Canal and Water Power Company was incorporated in 1892, and the articles of incorporation were amended in 1894. The canal has a water right dated December 26, 1892, to divert 100.00 ft^3/s (2.83 m^3/s) from the left bank of the North Platte River about 1.25 mi (2.0 km) south of Bayard, Nebr. Construction began in 1893, and 9 mi (14 km) of the canal were completed by July 1895. It has been extended from time to time and now is 15 mi (24 km) long. The Alliance Irrigation District was organized on April 7, 1913. Its operation includes optional diversions from Red Willow Creek and the Bayard Sugar Factory drain. The irrigated area totals 6,319 acres (2,557 hm^2) between Bayard and Bridgeport, Nebr. The Alliance Canal delivers water to the Schermerhorn project which has a water right dated October 25, 1897, for 29.71 ft^3/s (0.841 m^3/s) to irrigate 2,000 acres (809 hm^2).

06684000 Red Willow Creek near Bayard, Nebr.

LOCATION.--Lat 41°42'50", long 103°15'10", in NE¼NE¼ sec.13, T.20 N., R.52 W., Morrill County, on left bank 75 ft (23 m) downstream from timber bridge, 0.2 mi (0.3 km) downstream from Wild Horse drain, 0.8 mi (1.3 km) upstream from mouth, and 4.5 mi (7.2 km) southeast of Bayard.

PERIOD OF RECORD.--October 1931 to September 1973.

REMARKS.--Red Willow Creek originates in eastern part of Morrill County and flows south to join the North Platte River near Bayard, Nebr. Flow is seepage and return flow from Interstate, Tri-State, Ninemile, and Alliance Canals. Streamflow is affected by diversions from and spills to Red Willow Creek.

Monthly and annual mean discharges, water years 1932-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	156	56	112	21	19	10.89
November....	118	39	87	14	16	8.51
December....	95	56	76	9.6	13	7.44
January.....	84	47	66	8.4	13	6.47
February....	76	44	60	8.1	13	5.87
March.....	70	39	57	7.1	13	5.53
April.....	75	30	53	8.7	16	5.17
May.....	167	35	84	36	42	8.21
June.....	226	40	107	48	45	10.45
July.....	163	34	89	37	42	8.68
August.....	166	29	87	34	39	8.45
September...	302	31	147	66	45	14.33
Annual.....	120	56	86	18	21	100

Duration of daily mean discharge, water years 1932-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
15	100	53	80.9	180	5.6
17	99.9	60	68.5	210	3.6
19	99.8	68	54.2	240	2.1
22	99.7	77	41.9	270	1.3
25	99.3	87	32.1	300	.8
28	98.8	99	23.9	350	.4
32	97.7	110	18.9	390	.2
36	96.6	130	12.7	440	.1
41	94.1	140	10.5		
46	90.2	160	7.5		

Probability of annual high flows, water years 1932-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	127	113	94	83	73	65
50	2	350	275	227	191	159	131
10	10	682	495	372	300	243	187
4	25	890	624	446	354	283	211
2	50	1,060	730	501	395	313	229
1	100	1,250	842	557	435	342	245

Probability of annual low flows, climatic years 1933-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	12	14	15	17	23	27
2	50	14	15	17	20	25	30
5	20	17	18	21	23	29	35
10	10	20	21	24	27	33	40
20	5	23	25	28	32	38	45
50	2	31	33	36	41	47	55

BELMONT CANAL

The Belmont Canal and Water Power Company incorporated in 1889 has a water right dated December 19, 1889 to divert 270.00 ft^3/s (7.646 m^3/s) at the right bank of the North Platte River about 5.75 mi (9.25 km) southeast of Bayard. Construction of the canal began early in 1890 and continued until December 1892, during which time 41 mi(66 km) of main canal were completed. Water was first diverted in July 1892. The canal, operated by the Bridgeport Irrigation District, is now (1974) 36.3 mi (58.4 km) long and serves 8,600 acres (3,480 hm^2) between Bridgeport and Broadwater. Water is diverted from both the North Platte River and Cedar Creek.

EMPIRE CANAL

The Empire Canal Company has a water right dated June 25, 1891, for 28.57 ft^3/s (0.809 m^3/s) and another dated July 20, 1907, for 1.00 ft^3/s (0.028 m^3/s). The Empire Canal branches off the Belmont Canal about 1 mi (1.6 km) below the Belmont diversion works. Empire Canal serves 2,190 acres (886 hm^2) on the first terrace below the Belmont Canal.

06684500 North Platte River at Bridgeport, Nebr.

LOCATION.--Main channel gage, lat 41°40'39", long 103°105'45", in NW¼SW¼ sec.28, T.20 N., R.50 W., Morrill County, on downstream side of pier near center of bridge on U.S. Highway 26, 0.5 mi (0.8 km) north of Bridgeport. Browns Creek channel gage, lat 41°40'55", long 103°05'53", in NW¼NW¼ sec.28, T.20 N., R.50 W., Morrill County, on left bank 0.2 mi (0.3 km) upstream from culvert on U.S. Highway 26 and 0.8 mi (1.3 km) north of Bridgeport.

DRAINAGE AREA.--29,300 mi^2 (75,900 km^2), approximately.

PERIOD OF RECORD.--May 1916 to September 1973.

REMARKS.--Flow of river is affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals, diversions for irrigation and return flow.

Monthly and annual mean discharges water years 1958-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	2,000	1,110	1,570	253	16	10.30
November....	1,560	1,040	1,300	162	12	8.54
December....	1,350	887	1,130	119	11	7.38
January.....	1,090	742	996	97	10	6.52
February....	1,180	799	984	106	11	6.44
March.....	2,610	769	1,040	430	41	6.81
April.....	2,890	733	1,210	589	49	7.90
May.....	8,400	501	1,700	2,380	140	11.13
June.....	9,500	264	2,290	2,570	112	14.98
July.....	3,380	131	1,010	954	95	6.60
August.....	3,230	218	733	721	98	4.80
September...	4,020	391	1,310	836	64	8.60
Annual.....	2,900	713	1,270	666	52	100

Duration of daily mean discharge, water years 1958-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
71	100	400	90.6	2,300	7.1
83	99.9	470	88.7	2,700	5.6
97	99.6	550	86.0	3,100	4.5
110	99.2	650	83.0	3,700	3.3
130	98.8	760	78.0	4,300	2.7
160	97.8	890	67.1	5,000	2.0
180	97.3	1,000	54.8	5,900	1.6
210	96.1	1,200	35.3	6,900	1.3
250	94.8	1,400	23.3	8,100	1.0
290	93.8	1,700	13.0	9,500	.6
340	92.5	2,000	9.3	11,000	.2

Probability of annual high flows, water years 1941-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	1,390	1,370	1,360	1,210	1,090	1,130
50	2	3,290	2,970	2,590	2,220	1,870	1,570
10	10	7,170	6,510	5,800	5,140	4,380	3,360
4	25	10,200	9,330	8,580	7,830	6,800	5,180
2	50	12,900	12,000	11,400	10,700	9,410	7,180
1	100	16,300	15,400	15,000	14,400	12,900	9,960

Probability of annual low flows, climatic years 1959-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	42	47	53	54	67	108
5	20	58	64	70	73	93	150
10	10	78	86	94	102	130	211
20	5	116	121	136	161	203	292
50	2	195	208	235	284	366	511

BROWNS CREEK CANAL

The Browns Creek Canal Company was incorporated in 1891. The company has an appropriative right dated January 20, 1892, to divert 188.71 ft^3/s (5.340 m^3/s) at the left bank of the North Platte River about 0.5 mi (0.8 km) northeast of the town of Bridgeport. The Browns Creek Canal, operated by the Browns Creek Irrigation District, is 24 mi (39 km) long and serves 6,120 acres (2,477 hm^2) between Bridgeport and Broadwater. The District has a Warren Act Contract dated July 14, 1913, for 19,900 acre-ft (24.5 hm^3) of Pathfinder storage.

06685000 Pumpkin Creek near Bridgeport, Nebr.

LOCATION.--Lat 41°37'38", long 103°02'10", in SW¼ sec.12, T.19 N., R.50 W., Morrill County, on left bank 250 ft (76 m) downstream from bridge on U.S. Highway 385 and State Highway 92, 0.5 mi (0.8 km) upstream from mouth, and 4 mi (6 km) southeast of Bridgeport.

DRAINAGE AREA.--1,020 mi^2 (2,640 km^2), approximately.

PERIOD OF RECORD.--February 1931 to September 1973.

REMARKS.--Pumpkin Creek rises in the western part of Banner County near the Wyoming-Nebraska State line. It flows in a general eastward direction to join the North Platte River near Bridgeport, Nebr. The stream is about 72 mi (116 km) in length. There are numerous small canals that divert from the stream, and during dry years it is overappropriated.

Monthly and annual mean discharges water years 1932-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	48	10	26	10	39	6.95
November....	47	7.9	29	9.4	32	7.83
December....	48	19	34	7.9	24	8.92
January.....	50	20	35	8.0	23	9.19
February....	54	22	37	7.9	21	9.89
March.....	72	22	41	10	25	10.81
April.....	57	14	37	9.9	27	9.76
May.....	72	11	32	15	46	8.58
June.....	170	6.9	37	28	74	9.84
July.....	68	3.1	21	13	63	5.68
August.....	46	3.1	17	10	57	4.64
September...	126	7.9	30	19	65	7.91
Annual.....	44	19	31	6.4	20	100

Duration of daily mean discharge, water years 1932-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0.4	100	6.1	96.1	35	40.0
.5	99.9	7.9	93.7	45	16.8
1.4	99.8	10	90.5	57	4.4
2.3	99.6	13	85.9	74	1.3
2.9	99.3	17	79.8	94	.6
3.7	98.5	21	72.3	120	.3
4.8	97.7	27	60.7	160	.1

Probability of annual high flows, water years 1932-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	57	53	48	43	38	31
50	2	85	71	62	54	49	45
10	10	298	192	135	99	82	67
4	25	638	351	214	142	109	81
2	50	1,140	561	306	186	135	93
1	100	2,060	900	437	245	166	107

Probability of annual low flows, climatic years 1933-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0.29	0.45	0.91	1.5	2.2	3.3
2	50	.45	.63	1.2	1.8	2.8	4.1
5	20	.80	1.0	1.7	2.4	3.9	5.3
10	10	1.3	1.4	2.4	3.3	4.9	6.7
20	5	2.2	2.5	3.3	4.3	6.4	8.8
50	2	4.8	5.1	5.9	7.2	10	14

BEERLINE CANAL

The Beerline Canal District, organized in 1894, has a water right dated October 13, 1894, to divert 30.00 ft^3/s (0.849 m^3/s) at the left bank of the North Platte River about 4 mi (6.4 km) west of the town of Broadwater. The Beerline Canal is about 5 mi (8 km) long and serves 2,080 acres (842 hm^2) south and west of Broadwater. The District has a Warren Act Contract dated July 3, 1918, for 1,639 acre-ft (2.021 hm^3) of Pathfinder storage.

LISCO CANAL

In July 1893, Reuben Lisco posted a notice of appropriation for 32.86 ft^3/s (0.931 m^3/s) on the left bank of the North Platte River about 4.5 mi (7.2 km) northwest of Lisco, Nebr. He built a 5-mi (8-km) canal to irrigate his land. In 1896, the North River Irrigation and Water Power Company was organized and made application for an appropriation of 168.29 ft^3/s (4.766 m^3/s). A contract between Lisco and the Company was entered into whereby the Company acquired ownership of the Lisco Canal and in return agreed to enlarge the canal and to carry free of charge the water to which Lisco was entitled. The existing canal was enlarged and extended an additional 33 mi (53 km) during the period 1896-98. It served 13,500 acres (5,463 hm^2) for several years. Dissension over the use of water then arose between irrigators and the canal was not maintained and finally was no longer usable. Lisco obtained a decree confirming his water right and the use of the 5 mi (8 km) of the canal on his former right-of-way. He then attached a part of the Company Canal and took possession of the upper 7 mi (11 km), thus making the Lisco 12 mi (19 km) long. Later, a mutual stock company was organized and took over the management of the canal. The Lisco Canal has a priority date of July 1, 1893, for 19.85 ft^3/s (0.5622 m^3/s). Two relocations and three subsequent applications added an additional 35.29 ft^3/s (0.9994 m^3/s). The canals, operated by the Lisco Irrigation District and the North River Irrigation District, serve 3,868 acres (1,565 hm^2) near Lisco.

06686000 North Platte River at Lisco, Nebr.

LOCATION.--Lat 41°29'18", long 102°37'25", in NW¼SE¼ sec.33, T.18 N., R.46 W., Garden County, near right bank on downstream side of pier of highway bridge, 0.5 mi (0.8 km) south of Lisco.

DRAINAGE AREA.--30,700 mi^2 (79,500 km^2), approximately.

PERIOD OF RECORD.--September 1931 to September 1973.

REMARKS.--Flow is affected by transmountain diversions, storage reservoir, power development, ground-water withdrawals, diversions for irrigation, and return flow.

Monthly and annual mean discharges water years 1958-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	2,010	1,150	1,640	226	14	10.17
November....	1,650	1,110	1,420	148	10	8.80
December....	1,370	928	1,210	134	11	7.46
January.....	1,260	790	1,090	121	11	6.75
February....	1,450	944	1,140	124	11	7.02
March.....	2,840	849	1,220	454	37	7.54
April.....	2,670	861	1,340	538	40	8.26
May.....	7,760	535	1,730	2,180	126	10.68
June.....	8,200	263	2,290	2,340	102	14.13
July.....	3,400	101	1,030	980	95	6.38
August.....	3,380	188	726	766	106	4.49
September...	4,270	404	1,340	887	66	8.32
Annual.....	3,020	794	1,350	630	47	100

Duration of daily mean discharge, water years 1958-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
46	100	340	91.7	1,900	10.5
58	99.9	420	89.8	2,400	6.9
72	99.7	520	87.4	3,000	4.9
90	99.2	650	83.0	3,800	3.3
110	98.8	810	77.9	4,700	2.1
140	97.6	1,000	67.1	5,800	1.5
170	96.4	1,300	39.4	7,300	1.2
220	94.7	1,600	19.1	9,100	.5
270	93.4				

Probability of annual high flows, water years 1941-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	1,610	1,510	1,430	1,210	1,140	1,210
50	2	3,300	2,990	2,640	2,330	2,000	1,710
10	10	6,480	6,070	5,530	5,100	4,400	3,460
4	25	8,800	8,430	7,900	7,440	6,570	5,110
2	50	10,900	10,600	10,200	9,770	8,820	6,850
1	100	13,400	13,300	13,100	12,700	11,800	9,170

Probability of annual low flows, climatic years 1959-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	20	27	34	42	49	70
5	20	33	38	48	60	72	103
10	10	46	56	66	84	103	150
20	5	72	53	96	129	174	251
50	2	143	156	183	245	339	490

MIDLAND-OVERLAND CANAL

Midland-Overland Canal was formerly two separate canals. Both canals were built during 1894-95 and divert water at the left bank of the North Platte River. The Midland Canal with an appropriation date of June 9, 1894, for 12.00 ft^3/s (0.3398 m^3/s) was 4.5 mi (7.2 km) in length. The Overland Canal with an appropriation date of August 14, 1894, for 15.77 ft^3/s (0.4466 m^3/s) was 5 mi (8 km) long. The Midland diversion about 1.75 mi (2.8 km) south of Oshkosh is upstream from the Overland Canal. The Overland Canal crosses the Midland Canal 2 mi (3 km) below the headgate of the Midland Canal. The Overland Canal was sold to the Western Land and Cattle Company in 1905, and since then the part of the canal below the Midland Canal has been abandoned. This resulted in combining the two canals into a system 8.2 mi (13.2 km) long, now called the Midland-Overland Canal. This system serves 2,224 acres (900 hm^2) southeast of Oshkosh.

06687000 Blue Creek near Lewellen, Nebr.

LOCATION.--Lat 41°20'07", long 102°10'21", in NE¼ sec.30, T.16 N., R.42 W., Garden County, on right bank 130 ft (40 m) downstream from county highway bridge, 0.5 mi (0.8 km) downstream from bridge on U.S. Highway 26, 0.8 mi (1.3 km) upstream from mouth, and 1.5 mi (2.4 km) west of Lewellen.

DRAINAGE AREA.--1,120 mi^2 (2,900 km^2), approximately, of which about 80 mi^2 (210 km^2) contributes directly to surface runoff.

PERIOD OF RECORD.--October 1930 to September 1973.

REMARKS.--Blue Creek has its source in the sandhill springs and lakes in northwestern Garden County, Nebr. The stream flows generally southeastward and enters the North Platte River near Lewellen, Nebr. The stream is about 30 mi (48 km) in length. Blue Creek becomes perennial a few miles below Crescent Lake and the flow increases considerably downstream. Currently, there are 13 irrigation appropriations from Blue Creek totaling 289.69 ft^3/s (8.204 m^3/s), and one storage appropriation for 4.93 acre-ft (6,079 hm^3). Some of the canals along Blue Creek have storage contracts with the Lake Water Carrying Company for supplemental water from Crescent Lake. The water supply is inadequate during periods of drought.

Monthly and annual mean discharges water years 1931-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	114	2.6	55	25	45	6.56
November....	129	59	92	12	13	10.94
December....	135	80	96	10	11	11.44
January.....	128	83	97	10	10	11.48
February....	122	83	100	9.2	9	11.95
March.....	141	89	103	11	11	12.26
April.....	128	37	92	17	18	10.97
May.....	127	9.6	66	28	42	7.85
June.....	120	11	52	30	57	6.24
July.....	98	2.6	29	21	72	3.50
August.....	91	.64	24	21	87	2.88
September...	96	2.2	33	26	78	3.93
Annual.....	92	53	70	7.9	11	100

Duration of daily mean discharge, water years 1931-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0	100	1.7	92.4	21	80.0
.1	99.9	2.1	91.5	27	77.5
.2	99.3	2.7	90.7	34	74.7
.3	98.7	3.5	89.8	44	71.5
.4	98.1	4.5	89.1	57	67.1
.5	97.1	5.9	88.1	73	60.0
.6	96.5	7.5	87.0	94	36.6
.8	95.2	9.7	85.8	120	5.2
1.0	94.3	12	84.8	160	.4
1.3	93.2	16	82.3	200	.1

Probability of annual high flows, water years 1931-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	102	101	100	98	94	93
50	2	168	140	123	114	109	104
10	10	268	193	154	136	128	118
4	25	330	226	172	148	138	126
2	50	381	254	186	157	145	131
1	100	438	283	201	167	153	137

Probability of annual low flows, climatic years 1932-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0	0	0.09	0.20	0.27	1.1
2	50	0	0	.10	.22	.37	1.6
5	20	0	.02	.11	.26	.62	2.6
10	10	.02	.04	.13	.32	.96	3.8
20	5	.06	.09	.17	.42	1.6	6.0
50	2	.21	.23	.35	.90	4.1	12

06687500 North Platte River at Lewellen, Nebr.

LOCATION.--Lat 41°19'01", long 102°07'30" (north channel), and lat 41°18'47", long 102°07'25" (south channel) in W½ sec.34, T.16 N., R.42 W., Garden County, near left bank on downstream side of bridges on U.S. Highway 26, 0.5 mi (0.8 km) upstream from high-water line of Lake McConaughy and approximately 1 mi (1.6 km) southeast of Lewellen.

DRAINAGE AREA.--32,600 mi^2 (84,400 km^2), approximately.

PERIOD OF RECORD.--December 1940 to September 1973.

REMARKS.--Flow of river is affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals, diversions for irrigation, and return flow from irrigated areas.

Monthly and annual mean discharges water years 1958-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	2,150	1,060	1,730	295	17	10.04
November....	1,870	1,220	1,560	192	12	9.07
December....	1,540	1,060	1,290	132	10	7.48
January.....	1,390	952	1,170	107	9	6.79
February....	1,610	1,040	1,280	125	10	7.42
March.....	2,940	945	1,410	442	31	8.18
April.....	2,740	859	1,490	528	36	8.63
May.....	7,340	575	1,780	2,060	116	10.36
June.....	8,810	295	2,400	2,420	101	13.92
July.....	3,340	115	1,070	1,010	94	6.23
August.....	3,390	157	729	774	106	4.24
September...	4,220	371	1,320	893	68	7.64
Annual.....	3,060	864	1,430	625	44	100

Duration of daily mean discharge, water years 1958-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
52	100	400	90.3	2,200	9.1
62	99.9	480	88.7	2,600	6.8
87	99.6	560	86.4	3,100	5.2
100	99.4	670	83.0	3,700	3.6
120	98.6	790	79.1	4,300	2.8
140	97.9	940	73.1	5,100	1.8
170	96.7	1,100	65.8	6,100	1.5
200	95.8	1,300	49.9	7,200	1.1
240	94.4	1,600	26.8	8,500	.6
290	92.9	1,900	13.7	10,000	.1
340	91.9				

Probability of annual high flows, water years 1958-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	1,920	1,720	1,470	1,290	1,280	1,260
50	2	3,210	2,990	2,700	2,450	2,200	1,870
10	10	7,000	6,740	6,410	5,950	5,410	4,330
4	25	10,500	10,200	9,930	9,310	8,610	6,910
2	50	14,000	13,800	13,700	12,900	12,100	9,820

Probability of annual low flows, climatic years 1959-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	40	43	54	60	65	85
5	20	51	55	67	80	92	121
10	10	66	71	85	105	126	171
20	5	91	96	114	145	181	251
50	2	167	175	200	260	342	489

06690000 Lake McConaughy near Keystone, Nebr.

LOCATION OF DAM.--Lat 41°12'45", long 101°40'03", in NW¼SW¼ sec.3, T.14 N., R.38 W., Keith County, near right bank at outlet tower of Kingsley Dam on North Platte River, 4.5 mi (7.2 km) west of Keystone.

DRAINAGE AREA.--33,300 mi^2 (86,200 km^2), approximately.

PERIOD OF RECORD.--February 1941 to September 1973.

REMARKS.--Lake McConaughy has a capacity of 2,000,000 acre-ft (2.47 km^3). It is formed by Kingsley Dam which is across the North Platte River 8 mi (13 km) northeast of Ogallala and 52 mi (84 km) upstream from the confluence of the North and South Platte Rivers. The reservoir is the principal feature of the Central Nebraska Public Power and Irrigation District (Tri-County) which began to store water in February 1941. It stores all flow entering the reservoir not claimed earlier by senior appropriators below the dam. It provides storage water for power and the irrigation of lands in the Tri-County Project. Part of the North Platte Public Power and Irrigation District (Sutherland) storage right was transferred to McConaughy Reservoir, which in turn supplies supplemental storage water to serve 100,000 acres (40,500 hm^2) from private canals along the North Platte and Platte Rivers. Operation of the reservoir has a stabilizing effect on the downstream flow of the river.

SUTHERLAND SUPPLY CANAL

The Platte Valley Public Power and Irrigation District has a right dated January 13, 1934, to divert water from the North Platte River at a point a short distance below Kingsley Dam. The water right is for 6,000 acre-ft (7.398 hm^3) of storage in Lake Maloney and 265,000 acre-ft (327 hm^3) in Sutherland Reservoir, plus 975 ft^3/s (27.6 m^3/s) for power. Water was first turned into the canal December 5, 1935, and conveyed to and stored in Sutherland Reservoir. Water from the reservoir was first run through the North Platte powerplant during 1936. Another water right dated February 8, 1934, was granted the Platte Valley Public Power and Irrigation District (now part of the Nebraska Public Power District) for 25,000 acre-ft (30.8 hm^3) of storage to be diverted from the North Platte River at the same location as the earlier diversion. The District also has a water right dated March 29, 1943, to divert 500 ft^3/s (14.2 m^3/s) from the South Platte River into a canal near Korty, Nebr. This canal (capacity of 1,250 ft^3/s or 35.4 m^3/s) joins the main supply canal near the siphon outlet near Paxton, Nebr. (See section "Water use for power.") The Sutherland Reservoir was designed to furnish storage water for 100,000 acres (40,470 hm^2) under eight canals east of North Platte. Because of unusually high seepage losses from Sutherland Reservoir, an agreement was made with the Central Nebraska Public Power and Irrigation District to store in Lake McConaughy the 125,000 acre-ft (154 hm^3) of water previously allotted to Sutherland Reservoir.

06690500 North Platte River near Keystone, Nebr.

LOCATION.--Lat 41°12'30", long 101°37'50", in SW¼ sec.1, T.14 N., R.38 W., Keith County, on right bank 0.2 mi (0.3 km) downstream from diversion dam of Sutherland Reservoir Supply Canal and 2.5 mi (4.0 km) southwest of Keystone.

DRAINAGE AREA.--33,300 mi^2 (86,200 km^2), approximately.

PERIOD OF RECORD.--March 1942 to September 1973.

REMARKS.--Keystone Diversion Dam diverts water from the North Platte River to the Sutherland project 0.2 mi (0.3 km) above the river gaging station (06690500). The diverted water is conveyed through the 55-mi (88-km) supply canal cut through the divide between the North and South Platte Rivers and is then siphoned under the South Platte River through a 1.5-mi (2.4-km) tube near Paxton, Nebr. The supply canal also receives South Platte River water diverted by the Korty Diversion Dam about 7 mi (11 km) upstream. The combined flows pass through Sutherland Reservoir and Lake Maloney to the 26,000-kilowatt hydroplant south of North Platte. After being used to generate power, water then is returned to the South Platte River just above the confluence of the North and South Platte Rivers.

Monthly and annual mean discharges, water years 1943-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	999	5.6	255	282	111	4.92
November....	948	2.1	99	211	214	1.91
December....	883	1.6	45	163	365	.86
January.....	324	1.5	30	79	259	.59
February....	1,400	1.3	80	271	338	1.55
March.....	1,570	1.8	80	301	374	1.55
April.....	764	1.7	152	223	147	2.93
May.....	4,750	1.9	648	1,120	173	12.52
June.....	6,810	36	805	1,490	186	15.55
July.....	2,370	187	1,310	630	48	25.23
August.....	2,690	433	1,210	434	36	23.39
September...	2,770	109	466	488	105	9.00
Annual.....	1,510	168	435	303	70	100

Duration of daily mean discharge, water years 1943-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0.5	100	13	55.7	340	30.6
.7	99.9	18	54.3	460	25.6
1.0	99.7	25	53.1	640	21.4
1.4	97.7	35	52.0	880	17.4
1.9	95.1	48	50.6	1,200	12.8
2.6	87.7	67	48.8	1,700	7.6
3.7	76.5	92	47.2	2,300	2.6
5.0	69.9	130	44.5	3,200	.9
7.0	62.3	180	41.7	4,400	.7
9.6	57.7	240	37.1	6,100	.4

Probability of annual high flows, water years 1943-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	1,640	1,630	1,520	1,340	1,070	635
50	2	2,300	2,210	2,070	1,890	1,660	1,270
10	10	4,130	3,990	3,830	3,620	3,300	2,650
4	25	5,640	5,510	5,360	5,140	4,720	3,730
2	50	7,100	7,010	6,900	6,680	6,150	4,760
1	100	8,920	8,910	8,850	8,660	7,960	6,020

Probability of annual low flows, climatic years 1944-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	0.24	0.46	0.63	0.71	0.91	1.4
2	50	.30	.51	.69	.80	1.0	1.5
5	20	.43	.63	.83	.95	1.2	1.6
10	10	.57	.76	.97	1.1	1.4	1.7
20	5	.79	.95	1.2	1.4	1.6	1.9
50	2	1.4	1.5	1.8	2.1	2.6	2.9

KEITH AND LINCOLN COUNTIES CANAL

In 1894, the Sutherland and Paxton Land and Irrigation Company was organized and acquired a water right dated February 2, 1894, to divert 186.00 ft^3/s (5.267 m^3/s) at the right bank of the North Platte River at a point about 8 mi (13 km) northwest of Paxton. Twenty-eight mi (45 km) of canal were built in 1894. The canal crosses the divide between the North and South Platte Rivers and enters the South Platte valley just below Sutherland. Water was first diverted in 1895. In early 1905, the canal was transferred to the Keith and Lincoln Counties Irrigation Company which operated it for one year. The Keith-Lincoln Counties Irrigation District was organized on December 11, 1905, and purchased the assets of the Irrigation Company. The Keith-Lincoln Counties Canal is 30 mi (48 km) long and serves 5,968 acres (2,145 hm^2) between Paxton and Sutherland.

SHERIDAN WILSON CANAL

The Sheridan Wilson Canal Company has a water right dated October 9, 1890, to divert 10.00 ft^3/s (0.283 m^3/s) at the right bank of the North Platte River 3.5 mi (5.6 km) north of Paxton. The canal extends 3.5 mi (5.6 km) from point of diversion to the town of Sarben. Water is also diverted from Sarben Slough 2 mi (3.2 km) west of Sarben. The water irrigates 918 acres (372 hm^2) west of Sarben.

NORTH PLATTE CANAL

The North Platte Irrigation and Land Company, organized on May 14, 1883, diverts water at the right bank of the North Platte River 2.5 mi (4.0 km) northwest of Sutherland. The incorporators purchased 6,300 acres (2,550 hm^2) from the Union Pacific Railroad and resold the land to the company on July 1, 1894. During 1883-84, 25 mi (40 km) of canal were built. The North Platte Canal was the first canal in Nebraska to receive water from the North Platte River. An additional 7,300 acres (2,954 hm^2) were purchased from the Union Pacific on January 13, 1886. The canal was used only periodically from 1884 to 1890 because of adequate rainfall; however, a series of dry years beginning in 1890 caused increased use.

On January 26, 1886, the North Platte Irrigation and Land Company transferred all its holdings to the North Platte Land and Water Company. On February 1, 1892, the canal was transferred back to the North Platte Irrigation and Land Company, and the canal was administered by the two companies for 10 or 12 years.

The Platte Valley Irrigation District was organized on December 11, 1911. Upon order of the Court, the receiver of the North Platte Irrigation and Land Company transferred the 12.6-mi (20.3-km) canal to the District on February 6, 1912. The District has a water-right date of May 31, 1884, for 300.00 ft^3/s (8.49 m^3/s). The canal serves 14,065 acres (5,692 hm^2) between Sutherland and North Platte.

PAXTON AND HERSHEY CANAL

The Paxton and Hershey Irrigation Canal and Land Company was organized July 16, 1894. It has an appropriative right dated February 12, 1894, to divert 125.27 ft^3/s (3.55 m^3/s) at the right bank of the North Platte River 2.5 mi (4.0 km) northwest of Sutherland. The company constructed 10 mi (16 km) of canal in 1894. In 1907, the water users organized a mutual stock company and took over management of the canal. At present, the canal is 15.5 mi (25 km) long and serves 7,323 acres (2.964 hm^2) of land northeast of Sutherland.

06691000 North Platte River near Sutherland, Nebr.

LOCATION.--Lat 41°12'37", long 101°06'53", in sec.4, T.14 N., R.33 W., Lincoln County, on left bank 80 ft (24 km) downstream from bridge on county road, 2.5 mi (4.0 km) upstream from Birdwood Creek, and 3.5 mi (5.6 km) north of Sutherland.

DRAINAGE AREA.--33,800 mi^2 (87,500 km^2), approximately.

PERIOD OF RECORD.--May 1936 to September 1973.

REMARKS.--Streamflow is affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals, diversions for irrigation, and return flow from irrigation.

Monthly and annual mean discharges water years 1941-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	967	56	303	263	87	6.00
November....	1,160	77	234	220	94	4.64
December....	1,190	82	180	188	105	3.56
January.....	406	102	150	68	45	2.98
February....	1,510	120	211	254	120	4.18
March.....	1,750	107	231	290	126	4.57
April.....	835	74	250	200	80	4.96
May.....	4,380	46	585	1,030	177	11.59
June.....	6,980	40	663	1,460	220	13.14
July.....	2,130	73	969	574	59	19.21
August.....	2,180	24	924	414	45	18.32
September...	2,710	62	346	480	139	6.85
Annual.....	1,456	122	423	290	69	100

Duration of daily mean discharge, water years 1941-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
5.2	100	63	90.6	750	16.7
6.9	99.9	82	87.1	980	12.8
9.1	99.7	110	79.1	1,300	9.0
12	99.4	140	61.2	1,700	4.7
16	98.8	190	38.6	2,300	1.9
21	97.8	250	31.2	3,000	.9
27	96.7	330	26.7	3,900	.7
36	95.3	430	23.5	5,200	.5
47	93.1	570	20.2	6,800	.1

Probability of annual high flows, water years 1941-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	1,380	1,190	750	550	440	330
50	2	2,090	1,970	1,870	1,680	1,420	1,020
10	10	5,100	4,600	4,200	3,700	3,300	2,400
4	25	7,600	7,000	6,200	5,500	5,000	3,800
2	50	10,200	9,500	8,500	7,600	6,800	5,600
1	100	13,000	12,500	11,200	10,000	9,000	7,500

Probability of annual low flows, climatic years 1942-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	3.7	4.0	4.1	4.3	14	23
2	50	4.5	5.0	5.2	6.0	17	30
5	20	5.9	6.8	8.0	10	24	41
10	10	7.9	9.2	11	15	31	54
20	5	10	12	15	24	42	75
50	2	16	19	25	42	69	107

06692000 Birdwood Creek near Hershey, Nebr.

LOCATION.--Lat 41°13'20", long 101°04'12", in NE¼NW¼ sec.2, T.14 N., R.33 W., Lincoln County, on left bank 60 ft (18 m) downstream from bridge on county road, 1 mi (1.6 km) upstream from mouth, and 5 mi (8 km) northwest of Hershey.

DRAINAGE AREA.--1,000 mi^2 (2,590 km^2), approximately, of which about 80 mi^2 (210 km^2) contributes directly to surface runoff.

PERIOD OF RECORD.--May 1931 to September 1973.

REMARKS.--Birdwood Creek rises in sandhill springs and marshes of eastern Arthur County, Nebr. The stream is about 32 mi (51 km) in length. It follows a general southwestward course entering the North Platte River near the town of Hershey, Nebr. Currently, there are five appropriations from Birdwood Creek totaling 49.12 ft^3/s (1.391 m^3/s).

Monthly and annual mean discharges water years 1932-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	184	126	151	12	8	8.23
November....	215	137	162	17	10	8.79
December....	192	112	162	13	8	8.79
January.....	211	108	162	15	9	8.82
February....	202	111	167	17	10	9.10
March.....	205	146	173	13	7	9.42
April.....	220	139	170	15	9	9.23
May.....	207	127	160	18	11	8.70
June.....	180	117	142	16	11	7.75
July.....	167	102	128	17	13	6.98
August.....	184	104	124	16	13	6.75
September...	179	110	137	17	12	7.44
Annual.....	180	130	153	9.0	6.0	100

Duration of daily mean discharge, water years 1932-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
70	100	120	86.4	210	3.0
76	99.9	130	79.4	220	1.8
81	99.8	140	70.5	240	.8
87	99.5	150	58.3	250	.6
94	98.9	170	24.8	270	.4
100	97.7	180	13.9	290	.3
110	93.4	190	7.8	320	.1

Probability of annual high flows, water years 1932-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	196	194	176	166	161	154
50	2	277	225	204	192	183	178
10	10	469	309	250	223	207	196
4	25	615	369	276	239	219	204
2	50	750	422	298	251	227	209
1	100	912	482	320	263	236	214

Probability of annual low flows, climatic years 1933-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	52	60	70	78	94	99
2	50	57	66	76	82	96	102
5	20	64	73	82	89	98	104
10	10	73	81	87	93	101	107
20	5	80	86	92	97	104	111
50	2	92	97	102	106	112	119

SUBURBAN CANAL

The Farmers and Merchants Irrigation and Land Company was organized on May 24, 1894. The Company has a water right dated May 22, 1894, to divert 181.70 ft^3/s (5.146 m^3/s) at the right bank of the North Platte River about 3.5 mi (5.6 km) northwest of Hershey. During 1894-95, 18 mi (29 km) of canal were built to irrigate land in the vicinity and below North Platte. The Suburban Canal District was organized on April 20, 1896. The canal is 15.1 mi (24.3 km) long (1974) and carries water to irrigate 5,470 acres (2,214 hm^2) between Hershey and North Platte.

CODY AND DILLON CANAL

The Cody and Dillon Irrigation Canal Company is a partnership that has a water right dated December 29, 1893, to divert 125.81 ft^3/s (3.560 m^3/s) at the right bank of the North Platte River about 7.5 mi (12.1 km) northwest of North Platte, Nebr. The Company built 13 mi (21 km) of canal during 1894. The canal is now (1974) 5.6 mi (9.0 km) long and serves 4,750 acres (1,922 hm^2) northwest of North Platte.

06692500 Lincoln County drain No. 1 near North Platte, Nebr.

LOCATION.--Lat 41°09'40", long 100°47'25", in NE¼NE¼ sec.30, T.14 N., R.30 W., Lincoln County, on left bank 25 ft (8 m) upstream from highway bridge, 0.8 mi (1.3 km) upstream from mouth and 1.5 mi (2.4 km) northwest of North Platte.

PERIOD OF RECORD.--April 1955 to September 1973.

REMARKS.--Lincoln County drain No. 1 originates in east-central part of Lincoln County and follows an eastward course to join the North Platte River near North Platte, Nebr. The source of supply is principally from the North Platte River and Suburban Canals.

Monthly and annual mean discharges water years 1956-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	91	50	69	12	17	9.17
November....	61	37	46	5.6	12	6.13
December....	42	30	36	3.3	9	4.79
January.....	36	26	32	2.8	9	4.25
February....	38	24	30	3.6	12	4.01
March.....	44	26	30	4.2	14	3.96
April.....	55	27	39	9.4	24	5.16
May.....	86	40	64	14	23	8.53
June.....	109	60	83	13	16	11.06
July.....	117	72	93	14	15	12.48
August.....	126	97	113	10	9	15.13
September...	140	99	115	12	11	15.33
Annual.....	70	54	62	43	7	100

Duration of daily mean discharge, water years 1956-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
20	100	41	60.3	84	27.7
22	99.9	44	56.8	91	23.4
23	99.6	48	53.2	98	19.2
25	98.2	52	49.6	110	12.6
27	93.7	56	47.0	120	7.7
30	84.8	61	43.5	130	4.1
32	78.8	66	40.2	150	.8
35	70.6	71	36.3	160	.4
38	64.5	77	32.8	170	.1

Probability of annual high flows, water years 1956-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	128	110	100	98	95	89
50	2	157	147	135	129	124	117
10	10	237	180	155	148	140	131
4	25	296	195	162	156	146	136
2	50	350	206	166	162	150	139

Probability of annual low flows, climatic years 1957-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	17	20	22	22	24	24
5	20	18	21	22	23	24	25
10	10	21	22	22	23	24	25
20	5	22	23	23	24	25	26
50	2	24	25	25	26	27	29

06693000 North Platte River at North Platte, Nebr.

LOCATION.--Lat 41°09'13", long 100°45'16", in sec.28, T.14 N., R.30 W., Lincoln County, on right bank 150 ft (46 m) downstream from bridge on U.S. Highway 83, 0.5 mi (0.8 km) north of North Platte, Nebr., and 4.5 mi (7.2 km) upstream from confluence with the South Platte River.

DRAINAGE AREA.--34,900 mi^2 (90,400 km^2), approximately.

PERIOD OF RECORD.--February 1895 to September 1973.

REMARKS.--Streamflow is affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals, diversions for irrigation, and return flow.

Monthly and annual mean discharges water years 1941-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	1,230	296	556	272	49	7.02
November....	1,340	313	487	217	45	6.16
December....	1,440	296	414	196	47	5.24
January.....	590	289	364	57	16	4.60
February....	1,910	323	460	278	60	5.81
March.....	2,090	344	501	307	61	6.34
April.....	1,200	327	519	218	42	6.56
May.....	4,470	256	841	1,000	119	10.63
June.....	6,990	228	906	1,400	159	11.45
July.....	2,140	228	1,130	526	47	14.29
August.....	2,460	132	1,120	395	35	14.16
September...	3,090	248	612	502	82	7.74
Annual.....	1,720	332	661	292	44	100

Duration of daily mean discharge, water years 1941-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
63	100	370	66.4	1,800	5.3
75	99.9	450	41.7	2,200	2.5
110	99.8	530	32.0	2,600	1.7
130	99.5	630	26.3	3,100	1.1
150	99.1	760	22.0	3,700	.8
180	98.3	910	18.9	4,500	.7
220	96.0	1,100	15.2	5,300	.5
260	92.3	1,300	11.9	6,400	.3
310	83.4	1,500	9.1	7,600	.1

Probability of annual high flows, water years 1941-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	1,630	1,470	1,110	931	839	710
50	2	2,370	2,220	2,000	1,750	1,500	1,150
10	10	4,700	4,400	4,000	3,800	3,400	2,500
4	25	7,200	6,900	6,300	5,900	5,400	4,400
2	50	10,200	10,000	9,300	8,700	8,000	7,000
1	100	14,000	13,500	13,000	12,000	11,000	10,000

Probability of annual low flows, climatic years 1942-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	47	50	54	60	115	190
2	50	56	62	68	78	136	210
5	20	72	80	92	110	170	240
10	10	90	103	118	143	201	265
20	5	109	128	153	194	250	300
50	2	151	176	209	255	300	339

06762500 Lodgepole Creek at Bushnell, Nebr.

LOCATION.--Lat 41°13'43", long 103°48'03", in sec.33, T.15 N., R.57 W., Kimball County, on right bank 1.5 mi (2.4 km) east of Bushnell and 1.5 mi (2.4 km) upstream from Oliver Reservoir.

DRAINAGE AREA.--1,361 mi^2 (3,525 km^2).

PERIOD OF RECORD.--October 1931 to September 1973.

REMARKS.--Streamflow is affected by ground-water withdrawals, diversions for irrigation, and return flow.

Monthly and annual mean discharges water years 1935-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	15	6.1	10	2.4	24	7.16
November....	18	6.9	11	2.6	24	7.75
December....	16	6.0	10	2.7	26	7.44
January.....	16	2.9	10	2.7	27	7.26
February....	17	5.1	12	2.8	24	8.44
March.....	21	7.9	14	3.2	23	9.73
April.....	22	7.5	14	3.1	23	9.65
May.....	22	7.0	13	4.1	32	9.22
June.....	70	5.0	14	12	80	10.40
July.....	26	3.5	11	6.0	56	7.67
August.....	18	3.8	9.0	3.7	41	6.42
September....	59	4.2	12	12	99	8.86
Annual.....	18	6.7	12	2.4	21	100

Duration of daily mean discharge, water years 1935-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
1.8	100	8.9	66.9	45	0.6
2.2	99.9	11	48.9	55	.5
2.7	99.7	13	29.6	67	.4
3.3	99.4	16	11.5	82	.3
4.0	98.4	20	3.5	120	.2
4.9	96.0	24	1.8	150	.1
6.0	90.9	30	1.1		
7.3	81.2	37	.8		

Probability of annual high flows, water years 1935-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	7.9	8.2	8.8	9.0	9.2	9.4
50	2	75	49	34	25	20	17
10	10	392	198	105	60	40	27
4	25	777	361	172	89	53	33
2	50	1,240	545	242	118	66	38
1	100	1,910	803	334	154	80	43

Probability of annual low flows, climatic years 1936-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	1.0	1.6	1.8	2.0	2.2	3.0
2	50	1.2	1.9	2.1	2.4	2.5	3.3
5	20	1.6	2.4	2.8	2.9	3.1	3.9
10	10	2.2	2.9	3.3	3.6	3.8	4.6
20	5	3.0	3.5	4.0	4.4	4.7	5.4
50	2	4.6	5.1	5.6	6.1	6.6	7.2

06763500 Lodgepole Creek at Ralton, Nebr.

LOCATION.--Lat 41°02'00", long 102°24'00", in NE¼NW¼ sec.12, T.12 N., R.45 W., Deuel County, on right bank 20 ft (6 m) downstream from county road bridge at Ralton, 2.1 mi (3.4 km) north of Colorado-Nebraska State line and 5.5 mi (8.8 km) southeast of Chappell.

DRAINAGE AREA.--3,307 mi^2 (8,565 km^2).

PERIOD OF RECORD.--June 1951 to September 1973.

REMARKS.--Streamflow is affected by ground-water withdrawals, diversions for irrigation, and return flow.

Monthly and annual mean discharges water years 1952-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	30	0.59	7.1	7.4	104	5.62
November....	27	.55	8.5	6.6	77	6.77
December....	20	.63	8.6	5.8	68	6.79
January.....	19	.64	7.3	5.6	76	5.81
February....	23	1.9	9.2	5.7	62	7.29
March.....	32	2.9	14	8.1	59	10.92
April.....	34	.68	13	8.6	68	10.05
May.....	34	.38	14	9.1	66	10.92
June.....	91	.53	16	19	121	12.47
July.....	49	.49	10	13	127	8.06
August.....	132	.03	14	28	208	10.68
September...	22	.22	5.8	6.4	110	4.62
Annual.....	20	2.0	10	5.2	50	100

Duration of daily mean discharge, water years 1952-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0.0	100	1.2	88.6	19	14.3
.01	98.9	1.7	83.9	27	6.2
.1	98.8	2.5	77.6	39	1.8
.2	97.7	3.5	70.2	54	.8
.3	96.3	4.9	61.5	77	.3
.4	95.6	6.9	50.8	110	.2
.6	93.7	9.7	38.3	150	.1
.9	91.2	14	26.5		

Probability of annual high flows, water years 1952-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	15	9.5	6.7	5.5	4.4	3.4
50	2	43	39	34	29	26	22
10	10	298	219	148	97	69	47
4	25	847	511	288	159	99	60
2	50	1,840	941	458	222	126	70

Probability of annual low flows, climatic years 1953-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	0	0	0	0.02	0.05	0.11
5	20	0	0	0	.05	.14	.23
10	10	0	0	0	.11	.26	.41
20	5	0	0	.02	.22	.57	.77
50	2	.25	.29	.36	.62	1.1	2.2

06764000 South Platte River at Julesburg, Colo.

LOCATION.--Lat 40°58'46", long 102°15'15", in NW¼NE¼ and SE¼NE¼ (two channels) sec.33, T.12 N., R.44 W., Sedgwick County, on left bank of channel no. 4 (left channel), 215 ft (66 m) downstream from bridge, and on right bank of channel no. 2, 800 ft (244 m) downstream from bridge on U.S. Highway 385, 0.9 mi (1.4 km) southeast of Julesburg, 3 mi (4.8 km) upstream from Colorado-Nebraska State line, and 8 mi (13 km) downstream from Lodgepole Creek.

DRAINAGE AREA.--23,138 mi^2 (59,927 km^2).

PERIOD OF RECORD.--April 1902 to September 1973.

REMARKS.--Streamflow is affected by storage reservoirs and surface- and ground-water withdrawals for irrigation.

Monthly and annual mean discharges water years 1925-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	1,230	24	220	241	110	4.17
November....	1,420	47	302	249	82	5.72
December....	1,280	66	356	243	68	6.74
January.....	1,570	90	429	320	75	8.12
February....	1,860	79	531	378	71	10.04
March.....	2,200	69	514	435	85	9.73
April.....	2,440	41	460	545	118	8.71
May.....	8,590	29	875	1,800	205	16.56
June.....	6,680	29	1,074	1,580	147	20.30
July.....	2,330	16	250	429	172	4.73
August.....	1,080	14	129	219	170	2.44
September...	1,360	9.5	145	228	157	2.74
Annual.....	1,520	76	439	332	76	100

Duration of daily mean discharge, water years 1925-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
7.5	100	110	62.3	1,300	5.9
9.6	99.9	140	56.6	1,600	4.5
12	99.8	180	51.1	2,100	3.0
16	99.2	230	46.3	2,700	2.0
20	97.0	290	39.3	3,400	1.6
25	93.3	380	28.1	4,300	1.1
33	87.5	480	21.0	5,500	.8
42	82.2	610	16.1	7,100	.5
53	76.6	780	13.0	9,000	.1
68	71.7	1,000	9.1	12,000	.3
87	67.5				

Probability of annual high flows, water years 1925-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	163	154	141	123	116	111
50	2	2,330	2,140	1,880	1,530	1,170	903
10	10	11,900	10,200	8,350	6,590	4,620	3,090
4	25	22,300	18,500	14,600	11,400	7,750	4,910
2	50	33,700	27,400	21,000	16,300	10,900	6,650
1	100	49,200	39,000	29,200	22,600	14,800	8,750

Probability of annual low flows, climatic years 1926-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	8.1	8.7	9.3	9.8	11	11
2	50	9.0	9.6	10	11	12	12
5	20	11	11	12	13	14	15
10	10	12	13	14	15	16	18
20	5	15	16	17	18	19	23
50	2	21	22	23	25	29	39

06765000 South Platte River at Paxton, Nebr.

LOCATION.--Lat 41°07'04", long 101°21'18", in sec.8, T.13 N., R.35 W., Keith County, near left bank on downstream side of pier of highway bridge, 0.5 mi (0.8 km) south of Paxton.

DRAINAGE AREA.--24,000 mi^2 (62,160 km^2), approximately.

PERIOD OF RECORD.--January to December 1923; April 1931 to September 1933; May 1937 to April 1970.

REMARKS.--Streamflow is affected by storage reservoirs, power developments, and surface- and ground-water withdrawals for irrigation. Water is diverted for Sutherland Supply Canal, 6 mi (10 km) above station.

Monthly and annual mean discharges water years 1947-69

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	184	2.1	46	57	126	2.56
November....	191	2.8	25	45	179	1.40
December....	157	4.1	17	31	182	.96
January.....	369	5.2	25	75	301	1.40
February....	888	6.2	110	242	220	6.20
March.....	911	7.0	84	195	232	4.73
April.....	361	4.9	53	100	190	2.96
May.....	2,610	5.8	290	686	236	16.33
June.....	6,360	2.9	844	1,540	183	47.50
July.....	1,930	2.6	175	423	242	9.86
August.....	319	2.0	46	83	179	2.60
September...	325	2.0	62	94	151	3.50
Annual.....	629	4.3	147	167	114	100

Duration of daily mean discharge, water years 1947-69

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
0	100	24	24.1	650	4.3
.10	99.8	35	18.5	940	3.0
1.9	99.0	50	15.1	1,400	2.2
2.7	96.0	73	12.4	2,000	1.6
3.9	91.2	100	11.0	2,800	1.2
5.6	85.6	150	8.9	4,100	.8
8.1	69.4	220	7.2	5,900	.4
12	48.3	310	6.3	8,500	.2
17	31.9	450	5.3	12,000	.1

Probability of annual high flows, water years 1947-69

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	3.5	2.6	1.9	1.5	1.3	1.3
50	2	1,430	1,230	929	659	419	254
10	10	13,500	11,900	9,970	7,450	4,510	2,520
4	25	26,100	22,700	20,200	15,600	9,470	5,290
2	50	38,200	33,100	30,400	24,300	14,800	8,300

Probability of annual low flows, climatic years 1948-69

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	0.15	0.28	0.35	0.40	1.3	1.5
5	20	.50	.75	.90	1.0	1.8	2.1
10	10	.96	1.3	1.5	1.6	2.4	2.7
20	5	1.6	2.0	2.3	2.5	3.1	3.8
50	2	3.2	3.5	4.1	4.4	5.2	6.3

06765500 South Platte River at North Platte, Nebr.

LOCATION.--Lat 41°07'05", long 100°46'22", in NE¼NE¼ sec.8, T.13 N., R.30 W., Lincoln County, on left bank 0.5 mi (0.8 km) upstream from bridge on U.S. Highway 83, 0.7 mi (1.1 km) northwest of intersection of U.S. Highway 83 and Interstate 80 south of North Platte, and 5.5 mi (8.8 km) upstream from confluence with North Platte River.

DRAINAGE AREA.--24,300 mi^2 (62,900 km^2), approximately.

PERIOD OF RECORD.--June to November 1897; June to August 1914; May to September 1915; and May 1917 to current year.

REMARKS.--Streamflow is affected by storage reservoirs, surface- and ground-water withdrawals, and diversions for irrigation. Water has been diverted to Sutherland Supply Canal above station beginning November 13, 1946.

Monthly and annual mean discharges water years 1947-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	428	123	201	90	45	4.96
November....	324	121	162	46	28	4.01
December....	251	114	147	27	18	3.64
January.....	455	90	179	95	53	4.43
February....	932	124	281	232	83	6.95
March.....	1,020	134	248	200	81	6.14
April.....	970	135	250	184	74	6.17
May.....	7,430	122	780	1,530	196	19.29
June.....	6,360	135	1,060	1,450	136	26.25
July.....	2,190	85	350	443	127	8.65
August.....	449	94	171	86	50	4.24
September...	757	90	213	145	68	5.27
Annual.....	1,280	131	337	252	75	100

Duration of daily mean discharge, water years 1947-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
49	100	390	11.0	3,100	1.7
69	99.8	550	7.9	4,300	1.0
98	97.0	770	6.1	6,100	.5
140	69.9	1,100	4.0	8,600	.4
190	30.9	1,500	2.7	12,000	.1
270	16.5	2,200	2.1		

Probability of annual high flows, water years 1947-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	94	84	70	58	57	61
50	2	1,910	1,720	1,460	1,170	847	608
10	10	11,300	10,000	8,590	6,830	4,420	2,640
4	25	22,100	19,400	16,700	13,300	8,340	4,700
2	50	34,300	30,000	25,800	20,600	12,700	6,890

Probability of annual low flows, climatic years 1948-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
2	50	34	41	58	68	74	85
5	20	42	50	67	74	82	93
10	10	52	61	73	80	89	100
20	5	62	72	81	88	98	109
50	2	83	92	99	106	117	128

06765501 Platte River below confluence of North and South Platte Rivers

LOCATION.--Sec.7, T.13 N., R.29 W., Lincoln County, a short distance downstream from the confluence of the North and South Platte Rivers and about 4 mi (6 km) southeast of North Platte, Nebr.

DRAINAGE AREA.--59,200 mi^2 (153,000 km^2), approximately.

PERIOD OF RECORD.--October 1941 to September 1973.

REMARKS.--Record for this site is synthetic, composed of the sum of stations 06693000 North Platte River at North Platte, 06765500 South Platte River at North Platte, and 06764990 Sutherland power return.

Monthly and annual mean discharges water years 1942-73

Month	Maximum (ft^3/s)	Minimum (ft^3/s)	Mean (ft^3/s)	Standard deviation (ft^3/s)	Coefficient of variation (percent)	Annual runoff (percent)
October.....	2,100	540	1,390	331	24	6.10
November....	2,060	591	1,350	368	27	5.90
December....	2,090	656	1,420	390	27	6.21
January.....	2,260	607	1,410	376	27	6.17
February....	3,750	679	1,560	609	39	6.83
March.....	3,980	615	1,600	665	41	7.01
April.....	2,560	717	1,580	508	32	6.92
May.....	12,900	1,050	2,540	2,650	104	11.14
June.....	10,300	1,100	2,770	2,340	84	12.13
July.....	3,800	1,520	2,730	701	26	11.95
August.....	4,350	2,040	2,660	408	15	11.62
September...	5,390	1,190	1,830	711	39	8.02
Annual.....	4,200	1,380	1,910	602	32	100

Duration of daily mean discharge, water years 1942-73

Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)	Mean daily discharge (ft^3/s)	Days discharge was equaled or exceeded (percent)
420	100	1,500	54.2	5,100	2.2
480	99.9	1,700	41.6	5,800	1.8
540	99.6	1,900	32.6	6,600	1.6
610	99.0	2,100	24.0	7,500	1.4
700	98.0	2,400	17.5	8,500	1.2
790	97.1	2,800	13.3	9,600	1.0
890	95.0	3,100	10.0	11,000	.6
1,000	90.4	3,500	5.6	12,000	.4
1,100	84.5	4,000	3.2	14,000	.2
1,300	71.3	4,500	2.7	16,000	.1

Probability of annual high flows, water years 1942-73

Exceedence probability (percent)	Recurrence interval, in years	Highest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	15	30	60
99	1	2,240	2,140	2,080	2,000	1,900	1,800
50	2	5,060	4,760	4,440	4,020	3,440	2,890
10	10	12,500	11,400	10,200	8,770	6,990	5,510
4	25	19,100	17,200	15,100	12,800	10,100	7,870
2	50	25,900	23,100	20,000	16,900	13,400	10,300
1	100	34,700	30,700	26,200	22,100	17,600	13,400

Probability of annual low flows, climatic years 1943-73

Non-exceedence probability (percent)	Recurrence interval, in years	Lowest average flow, in cubic feet per second					
		1 day	Consecutive days				
			3	7	14	30	60
1	100	280	416	440	470	520	580
2	50	330	460	490	540	600	660
5	20	400	532	617	640	724	800
10	10	496	602	684	750	804	881
20	5	586	696	773	844	906	985
50	2	793	903	967	1,040	1,120	1,210

ABANDONED CANALS

The following canals at one time diverted water from the North Platte River but are no longer in use:

Name of canal	Date of water right	Second-feet granted	Acreage to be served
*Alfalfa	3-25-95	100.00	7,000
**Hannah	9-24-94	5.71	400
Lamore	7-18-96	20.00	1,400
Lyons	12-22-94	42.14	2,950
Oshkosh	10-5-94	40.00	2,800
Rush Creek	12-11-94	9.64	675
Signal Bluff	1-16-95	30.13	2,110
Spohn	12-6-94	11.89	832

*Alfalfa Canal received water at the right bank of the North Platte River about 3 mi (5 km) east of Lewellen, and extended about 18 mi (29 km) east near the town of Lemoyne. The canal now is inundated by Lake McConaughy. Small canals that diverted from Clear, Otter, Sand, Spring, Lonergan, Meadow Brook, and Golden Creek tributaries now are inundated by McConaughy.

**Hannah Canal is used only to irrigate small areas of hay meadow.